Mugla Journal of Science and Technology

PROBLEMS AND SUGGESTIONS FOR OFFICE FURNITURE MANUFACTURE

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Received: 31.10.2016, Accepted: 22.11.2016
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Abstract

This study aims to identify the problems encountered in production lines for office furniture manufacturers and gives suggestions to the problems. For this response, a questionnaire was designed and conducted with directors or owners of 50 office furniture manufacturers of small, medium and large scale size enterprises which were randomly selected from different cities. The questionnaire aims to focus on identifying the fundamental obstacles for production, marketing, sales and law. The data from questionnaire was calculated with frequency numbers and percentages for statistical values. In respect to the scope of dependent variables for the study, relationships between the independent variables such as the size of the company scale and Chi Square Single Analysis of Variance (ANOVA) were determined. According to the results, 52% of customers constitute owners. The biggest obstacle is the lack of qualified personnel in office furniture production while 46% of customers complain about pour designs. As a result, the study concludes with specific obstacles for logistics (30%), distributions (18%), unpaid bills after delivery (28%), and unconscious of the consumer (24%) in the office furniture sector.

Keywords: Office Furniture, Production, Enterprise

OFİS MOBİLYASI ÜRETİMİNDE SORUNLAR VE ÇÖZÜM ÖNERİLERİ

Özet

Bu çalışmada, büro mobilyası üretimi yapan işletmelerde üretim sürecinde karşılaşılan sorunların tespit edilmesi ve bu sorunlara yönelik çözüm önerilerinin geliştirilmesi amaçlanmıştır. Bu amaca uygun olarak, Türkiye'nin farklı illerinde faaliyet gösteren küçük, orta ve büyük ölçekli işletmeler arasından tesadüfi yöntem ile seçilen 50 adet işletmenin sorumlularına anket uygulaması yapılmıştır. Uygulanan anket, işletmelerin mevcut yapısal ve hukuki özelliklerini, üretim ve pazarlamaya yönelik sorunlarını belirlemeyi amaçlayan sorulardan oluşmaktadır. Ankete verilen cevapların frekans sayıları ve yüzdelik değerleri hesaplanmıştır. Ayrıca, bağımlı değişkenler kapsamında, firmaların ölçek büyüklüğü gibi bağımsız değişkenler arasındaki ilişkiler Ki Kare ve Tekli Varyans Analizi (ANOVA) ile test edilmiştir. Elde edilen sonuçlara göre, müşterilerinin %52'isi mülkiyet sahipleri oluşturmaktadır. Büro mobilyası üretimindeki en büyük zorluk kalifiye personel yetersizliğidir. Üretimini yapılan ürünler ile ilgili müşterilerin %46'sından şikâyet almaktadır. Araştırma kapsamına alınan işletmelerin %30'unun lojistik, %18'inin önceden belirlenen tarihte ürün teslimi yapamamak, %24'ünün tüketicinin bilinçsiz olması ve %28'inin ise teslimattan sonra ürün bedelinin tahsilatının yapılamaması gibi sorunlar ile karşılaştığı tespit edilmiştir.

Anahtar Kelimeler: Ofis mobilyası, Üretim, İşletme

1 Introduction

Office design is an important issue, which needs careful considerations. It could be argued that office design could in a general way raise or depress morale, and could in some more specific way have a major impact on how well the organization functions. It is not only a question of decor or facilities, but also much more about what has been described as organizational ecology–the symbiotic relationship between the social organism of the organization and the physical structure of the environment within which people breathe and mutate [1]. In this context, office design might be argued as an important activity, which can present new ways in which people can work better in their organizations. Along with it, furniture plays and takes a significant part in office design. After the industrial revolution that is accepted as the beginning of technological developments in the world history, that makes the production unlimited, changes the consumer concept completely, reshapes the models in production-consumption relation, human and life conditions have changed to a large extent. As a result of the developments carried out with the Industrial Revolution, many significant inventions have been performed, technology has progressed, and also the limits in transportation have been removed. In addition to all these improvements, conveniences in the production have changed consumption habits and allowed a new consumption-focused world order to appear [2,3].

Although alternative materials such as steel, aluminum, glass and plastic are used in furniture making, wooden material is able to have its popularity in this point. Wooden material is being used in especially for residence equipment such as table, wardrobe, bedstead, nightstand, bookcase, and school desks and tables [4].

In the beginning of 1960s, office furniture sector in Turkey became industrialized, and started to develop in 1980s. Development in commerce, establishment of new private companies, rise of banking sector and construction of luxury business centers helped the sector to grow [5].

Just like in each sector, there are some problems with design, production, marketing, and after sales services in office furniture sector, thus many studies in resolution of these problems or improvement of current situation, which focus on different points, have been performed.

The investment opportunities of a company, which is involved in making office furniture through mass production, have been researched. The questions-respectively, market and demand research, technology, capacity and location of establishment, product design and projecting, production process, determination of quality control policy, performance of in-plant arrangements, personnel requirement, organization of departments, investment analysis, investible factors in terms of technique and economy (feasibility) -have been examined, the conclusion indicates that the mass production in office furniture is possible with technical equipment and opportunities, and that economic efficiency criterion makes such a company profitable investment for investors and country economy [6].

In the research on physical conditions of production workshop that belong to 99 furniture companies within Siteler area of Ankara city, it is concluded that these workshops have no sufficient physical equipment, and that workers have no sufficient knowledge about infrastructure use, however, these deficiencies may be corrected through the trainings of workers about occupational safety, productivity and technological developments [7].

In the research on furniture companies in Istanbul, it is concluded that 25,5% of companies has insufficient trained personnel; 27,5% has insufficient raw material, 24% has insufficient technology and also 13% has problems with energy. In order to allow these companies to obtain modern production methods, educational levels of personnel in the sector must be higher, small and medium-sized companies must combine their own production capacities, moreover, quality of raw material must be increased, and those must be encouraged to use new technologies, in addition, cheaper energy must be provided, they must be trained about marketing and advertisement, lastly, they must be provided with easier credit supports and supportive measures etc. [8].

In another research, face to face meetings have been organized with the participation of total 608 Turkish companies-33 large-sized, 39 medium-sized and 536 small-sized, thus they have subjected to an inquiry with 45 questions. Research indicates that the most important problem in furniture industry is the lack of qualified personnel. Respectively, the lack of technology and energy keeps up with the main problem. Moreover, the lack of genuine design appears as another one of problems. As a result, the lack of qualified personnel must be resolved through the collaboration between trade associations and universities, in addition, the endorsements for small and medium-sized companies must be generalized with easier ways [9].

It can be said that office furniture sector in Turkey started to grow after 1940s, so this growth accelerated the development in Turkish banking sector. The requirements in office furniture, which was commonly provided through importation in 1980s, gave producers a ground for their reorganization in 1990s [10]. By the way of acceleration since 1990s, Turkey's office furniture sector have had part in the first five within Europe, and the first 7 over the world according to quantity of parts manufactured [11].

According to data from Office Furniture Industry and Businessmen Association (OMSİAD), the size of furniture market in Turkey is 9 billion USD, consequently, office furniture consists of 20-30% of this market [12].

In literature, it is understood that office furniture producers and their personnel have no insufficient knowledge in the use of infrastructure, and that consumers generally focus on materials ad workmanship in the purchase of furniture. In this study, it is aimed at determining current situation of companies in making office furniture; major issues in production process against these companies; the existence of different issues by the size of a company; and improving solution offers for such issues.

2 Research Method

Small, medium and large-sized companies of office furniture production from different cities of Turkey were included in this study which is aimed at determining the issues in production process of office furniture and improving solution offers for the problems encountered. In this scope, 50 administrative managers, production and design managers were subjected to an inquiry. In 2014, the inquiry was performed by face-to-face meetings with company authorities. The response duration of participants to the inquiry took about 15-20 minutes. According to classification by Turkish Statistical Institute, from the companies, 62% is small-sized, 10% is medium-sized, 28% is large-sized.

2.1 Inquiry design

Closed ended, two-choice and multiple choice questions have been used. The reliable and well accepted samples of inquiry, which were previously developed by Şenol, (2010), Demirci (2005), Yıldırım and et al. (2003) and Eroğlu (2007) [13-16], have been used to create a new inquiry form for the aim of research. In this inquiry, the questions such as corporate info, production, application and marketing have taken place. The implementation of this inquiry has been performed with the participation of company holders or production managers by using face-to-face meetings.

2.2 Statistical Evaluation

Frequency numbers and percentages of data obtained have been calculated. On the other hand, the relations / differences between independent variables such as the size of companies have been tested by using Chi-square and Unique Variance Analysis (ANOVA).

3 Findings

The inquiry data, which was performed in order to determine current situation of 50 small, medium and large-sized companies in office furniture sector, have been systematically analyzed as following. According to a question "In your opinion, is the design and production of office furniture a profitable field?", 86% of participants believes that design and production of office furniture is profitable field.

The outcomes of Chi-Square, which has been implemented in order to determine if there is a significant relation between reason of activity in office furniture, playing a role in this field and the size of companies, are shown in Table 1. The employer individuals or organizations, who assign these companies to office furniture works according to their sizes, are shown in Table 2. The demands of companies for qualified personnel by their sizes are shown in Table 3.

Table 1. Chi-Square, results and reasons for performing in office furniture sector

Reasons for Performing in Office Furniture Sector	Scale of the Company						Total	
	Small		Medium		Large			
	fi	%	fi	%	fi	%	fi	%
Having a profitable business	18	36	2	4	9	18	29	58
Family Profession	3	6	-	-	-	-	3	6
The lack of product diversity	2	4	2	4	2	4	6	12
Government agency or state company to be a customer	8	16	1	2	3	6	12	24
Total	**31**	**62**	**5**	**10**	**14**	**28**	**50**	**100**
Chi-Square								
X^2			df				P	
6.450			6				0.375	

fi: Number of enterprise, %:Percentage, X2: Chi-Square, df: Degree of freedom, P: Level of importance

Table 2. Firms takes office furniture business from individuals, institutions or organizations

Main Customers	Scale of the Company						Total	
	Small		Medium		Large			
	fi	%	fi	%	fi	%	fi	%
Property owners	19	38	2	4	5	10	26	52
State Supply Office	5	10	0	0	4	8	9	18
Municipalities	4	8	0	0	2	4	6	12
State Departments and Agencies	3	6	3	6	3	6	9	18
Total	**31**	**62**	**5**	**10**	**14**	**28**	**50**	**100**
Chi-Square								
X^2			df				P	
10.063			6				0.122	

fi: Number of enterprise, %:Percentage, X2: Chi-Square, df: Degree of freedom, P: Level of importance

Table 3. The need of qualified workforce in accordance with the size scale

Needed Workforce	Scale of the Company						Total	
	Small		Medium		Large			
	fi	%	fi	%	fi	%	fi	%
Experienced Manager	4	8	1	2	3	6	8	16
Architect	2	4	0	0	0	0	2	4
Interior Designer	16	32	2	4	2	4	20	40
Industrial Designer	1	2	0	0	1	2	2	4
Technical teacher	4	8	2	4	5	10	11	22
Technician	4	8	0	0	3	6	7	14
Total	**31**	**62**	**5**	**10**	**14**	**28**	**50**	**100**
Chi-Square								
X^2			df				P	
10.049			6				0.436	

fi: Number of enterprise, %:Percentage, X2: Chi-Square, df: Degree of freedom, P: Level of importance

According to Table 1, the reasons of why the companies have the activities in office furniture sector is shown as following: 58% of companies in this sector depends on its profits; 6% depends on traditional father's occupation; 12% depends on less product range; 24% depends on customer range, from state and private sectors. According to Chi-square test, there is no significant statistical relation between activity reasons of companies for office furniture sector and their sizes at the level of $p<0.05$.

According to outcomes shown in Table 2, the companies are assigned to perform office furniture works by following employers. 52% is property owners; 18% is State Supply Office; 12% is municipalities and 18% is public organizations. According to Chi-Square test, there is no significant statistical relation between the type of individuals / organizations and the size of companies at the level of $p<0.05$.

Basic requirements of companies for candidates making a job application are shown in Table 4.

Table 4. Seeking features in application for job candidates

Seeking features	Frequency (f_i)	Rate (%)
Skills and attitudes of the candidates	31	62
Work experience and references	19	38
Total	**50**	**100**

According to outcomes shown in Table 4, 62% of companies focuses on skills and attitude of candidates making a job application; 38% focuses on business experience and references of candidates. The information about the office furniture with the most popular design and production of companies is given in Table 5.

Table 5. Most production made for office furniture

Mostly produced office furniture	Frequency (f_i)	Rate (%)
Senior office rooms	24	48
Junior office rooms	8	16
Armchairs	4	8
Paneling, decorative elements, such as separator	14	28
Total	**50**	**100**

Assessment of issues in production of office furniture by their sizes is shown in Table 6.

Table 6. Difficulties in office furniture production

Difficulties	Scale of the Company					
	Small		Medium		Large	
	X	S	X	S	X	S
Deficiencies in the material supply (DMS)	2.93	1.52	3	1.41	2.92	0.82
Lack of qualified workforce (LQW)	4.35	0.83	3.2	1.48	4.21	0.89
Incompatibility with production design (IPD)	3.45	1.12	3.2	0.83	3.71	0.82
Patent-registered operations (PRO)	2.90	1.51	3.4	1.81	3.21	1.57
Insufficiencies in machinery and equipment (IMQ)	3.42	1.43	2.6	1.67	3.64	0.92
Results of the ANOVA						
	DMS	*LQW*	*IPD*	*PRO*	*IMQ*	
F	0.504	1.496	1.202	1.043	0.917	
df			4			
P	0.733	0.219	0.323	0.396	0.463	

X: Average Value, S: standard deviation, F: F Value, df: Degree of freedom, P: Level of importance Note: (1: least important, 5: most important)

According to outcomes shown in Table 3, 16% of participants in the inquiry needs experienced director; 4% needs architect; 40% needs interior architect; 4% needs industrial designer; 22% needs technical teacher and 14% needs technician. In Chi-Square test performed, there is no significant statistical relation between the most needed personnel in companies and the size of companies according to $p<0.05$ level.

According to Table 5, 48% of companies designs and produces offices; 16% designs and produces furniture of staff room; 8% designs and produces chairs; 28% designs and produces wainscot, separator and other decoration elements.

According to Table 6, the most significant issue among the difficulties in production of office furniture is lack of qualified personnel. ANOVA test indicates that the effect of the size of companies on difficulties in production of office furniture has no statistical significance according to p< 0.05.

The most preferable materials for companies in production of office furniture are shown in Table 7.

Table 7. Most preferred materials for office furniture manufacture

Most preferred materials	**Frequency (f_i)**	**Rate (%)**
Chipboards	11	22
MDF	1	2
Laminated particleboards/MDF	12	24
Solid Wood	3	6
Veneered particleboards/MDF	10	20
Lacquered particleboards/MDF	11	22
Metal/Glass/Steel	2	4
Total	**50**	**100**

According to Table 7, 22% of companies prefer to use melamine coated chipboard; 2% uses MDF-LAM; 24% uses laminated flake board/MDF; 6% uses solid wood; 20% uses wood coated flake board/MDF, 22% uses lacquer painted MDF and 4% uses metal/glass/steel material. According to a question "Do your customers complain about the products that you are currently designing and producing?", the companies in the scope of this research have responded as following; 54% of companies "No", 46% "Yes". The complaints with "Yes" answers are shown in Table 8.

Table 8. Received complaints from customers about design and production

Received complaints	Frequency (f_i)	Rate (%)
Materials and equipment defects	16	32
Design defects	1	2
Measurement and manufacturing defects	9	18

Chi-Square Test results, which has been performed in order to determine the marketing methods by the size of companies, and the relation between the size and marketing methods of companies, are shown in Table 9.

Table 9. Marketing methods for products

Marketing Methods	*Scale of the Company*						*Total*	
	Small		*Medium*		*Large*			
	fi	*%*	*fi*	*%*	*fi*	*%*	*fi*	*%*
Our own store	17	34	2	4	7	14	26	52
Through reseller	1	2	1	2	2	4	4	8
Special order	13	26	2	4	5	10	20	40
Chi-Square								
X²	***df***				***P***			
5.702	6				0.457			

fi: Number of enterprise, %:Percentage, X2: Chi-Square, df: Degree of freedom, P: Level of importance

According to Table 8, 32% of complaints from customers depends on material and appliance defects; 2% depends on design faults and 18% depends on measurement and production faults.

According to Table 9, 52% of companies markets its products by means of its own shop; 8% markets by means of a dealer; 40% markets by means of specific order. Chi-Square test indicates that there is no significant statistical relation between the size of companies and their marketing methods according to p<0.05 level.

Chi-Square test results, which has been performed in order to determine the issues in delivery of products, and the relation between the issues in delivery of products and the size of companies, are shown in Table 10.

Table 10. Problems encountered in the delivery of products

Problems encountered in the delivery	***Scale of the Company***						***Total***	
	Small		***Medium***		***Large***			
	fi	***%***	***fi***	***%***	***fi***	***%***	***fi***	***%***
Logistics (transport to the delivery address) problems	8	16	1	2	6	12	15	30
To make delivery of the product in time	5	10	2	4	2	4	9	18
User / consumer to be informed	7	14	2	4	3	6	12	24
The collection of product price	11	22	0	0	3	6	14	28
Total	**31**	**62**	**5**	**10**	**14**	**28**	**50**	**100**
Chi-Square								
X²			***df***				***P***	
5.466			6				0.486	

fi: Number of enterprise, %:Percentage, X2: Chi-Square, df: Degree of freedom, P: Level of importance

According to Table 10, the companies in the scope of this research encounter following problems; 30% with logistics; 18% with failure to deliver the product on designated date; 24% with unconscious consumer; 28% with difficulties in making collections after the delivery of products. Chi-Square test indicates that there is no significant statistical relation between company's problems in delivery of products and the size of companies according to p<0.05.

The difficulties in design-production-marketing circle by frequency are shown in Table 11.

Table 11. Difficulties in the design, production and marketing cycle

Difficulties	***Scale of the Company***					
	Small		***Medium***		***Large***	
	X	***S***	***X***	***S***	***X***	***S***
Design (D)	3.09	1.24	2.2	1.09	2.85	0.86
Production (P)	2.87	1.08	2.4	1.14	2.92	0.82
Marketing (M)	3	1.09	2.6	1.34	3.07	0.73
After sales (AS)	2.67	0.97	2.4	1.14	2.78	1.18
Results of the ANOVA						
	F		***df***		***P***	
D	0.367		4		0.831	
P	4.099		4		0.006	
M	0.321		4		0.862	
AS	0.598		4		0.666	

X: Average Value, S: standard deviation, F: F Value, df: Degree of freedom, P: Level of importance Note: (1: least important, 5: most important)

According to results in Table 11, the difficulties in marketing phase gain more importance among other difficulties in design-production-marketing circle. ANOVA test indicates that there is a significant statistical relation at the p< 0.05 level between the difficulties in design-production-marketing circle and the size of companies for the factor of "problems encountered in the phase of production". Accordingly, it is understood that small and large-sized companies have more importance than medium-size companies.

4 Acknowledgment

This study was presented as an oral presentation at the 2nd International Furniture Congress, 13-15 October 2016, Muğla, Turkey.

5 Conclusions and Recommendations

It is understood that 86% of companies considers that making office furniture is a profitable field of business; 14% considers that designing and making office furniture is not profitable, because of the failure to create specific design and of the high rates in material costs. This situation indicates that the companies carry on with the activities in this field, because of the factors such as "traditional father occupation", lack of product range and customers from state or private organizations, regardless of the fact that such companies regard the design and production of office furniture as non-profitable filed of business.

The companies are assigned to perform office furniture works by following employers. 52% is property owners; 18% is State Supply Office; 12% is municipalities and 18% is public organizations.

Regardless of the size of companies, 16% of companies needs experienced director; 4% needs architect; 40% needs interior architect; 4% needs industrial designer; 22% needs technical teacher and 14% needs technician. Regarding to candidates who make a job application, 62% of companies focuses on skills and attitude of candidates making a job application; 38% focuses on business experience and references of candidates. Regarding to product range, 48% of companies designs and produces offices; 16% designs and produces furniture of staff room; 8% designs and produces chairs; 28% designs and produces wainscot, separator and other decoration elements. As shown in other similar researches in the literature, almost all companies engaged in production of abovementioned product range need qualified personnel [8,9].

A great majority of companies uses such materials as laminated flake board/MDF (24%) in the production of office furniture. 32% of complaints from customers after delivery of products is related to material and appliance defects. This situation can be expressed with the problems encountered in material and appliance quality.

The companies in the scope of this research have significant issues such as logistics (30%), failure to deliver the products on specified date (18%), unconscious consumers (24%) and difficulties in making collections after delivery of products (28%).

As a result, following recommendations may be brought forward to resolve the issues and problems against the companies engaged in making office furniture.

1. In order to create specific designs, the companies must employ trained designers for furniture designs; in order to follow the improvements in both design and material specs, in-service trainings must be organized.
2. The lack of qualified personnel can be easily resolved with the collaboration of educational institutions and industry. All over the country, there are many secondary schools and occupational high schools that are engaged in furniture production, decoration and indoor design. By means of collaboration with these schools, the eligible students, who are able to meet the requirements of companies, can be determined during the internship, thus such students may be employed after their graduation.
3. Regarding to failure to find domestic raw and semi-finishing material in order to meet the requirements of woodworking industry in terms of quantity, time and quality, this issue can be resolved by institutionalizing the raw and semi-finishing producer organizations by means of government promotions, thus raw and semi-finishing material with higher production capacity and applicable standards can be provided in order to resolve the issues arising from the material resources.
4. Regarding to transportation and delivery of finished furniture. The products must be protected from such damages as crushing, scratch and fractures during the transportation of products to long distances. Specific studies in relation to resolution of such problem can be carried out.
5. In order to overcome the difficulties in marketing and delivery of products at the shortest time, marketing managers should inform the customers/users about specs and functions, quality, price, safety, health, warranty and technical service of products that meet the demands of users.

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