



The Effects of Planned Obsolescence Strategies on Dust Bagless Vacuum Cleaner Designs in the Local Market of Turkey

Merve SEYHAN¹, H. Güçlü YAVUZCAN^{2,*}

¹ 0000-0002-4847-5246, *Ostim Technical University, Faculty of Architecture and Design, Department of Industrial Design, Ankara*

² 0000-0001-8560-7845, *Gazi University, Faculty of Architecture, Department of Industrial Design, Ankara*

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Abstract

The concept of planned obsolescence can be defined as a marketing strategy in which the manufacturers deliberately and consciously design the products to have a shorter lifespan and to make the products less durable. With the consumer society, the need for a new workspace to design products and systems has emerged, and thus the industrial design profession has emerged. In order to increase consumption, products are produced by deciding how long they will be used during the design process. Industrial designers design based on limited functional life design, design for limited repair, and the creation of new needs. The main purpose of this study is to examine whether the planned obsolescence strategy is effective in the designs of products produced in the Turkish local market. For this purpose, a questionnaire consisting of 125 participants was conducted to determine the product group to be studied first. Then, literature research and market research were carried out. The technical components and features of the products of the specified brands were investigated. Planned interviews were made with the R&D managers or industrial design managers of the specified brands. The data obtained as a result of all the researches were classified according to the planned obsolescence types and matrices were formed. According to the data obtained, it is seen that the tendencies towards the planned obsolescence strategy are similar in most of the sampled brands.

1. INTRODUCTION

In this day and age, production times have decreased through technological developments and product variety has increased. In an increasingly competitive environment, companies have started to implement planned obsolescence policies by shortening their product lifetimes. Planned obsolescence is the sum of all intentional decisions to design a product in a way that it cannot function after a specified period of time or to make it old fashioned [1]. With the development of the consumer society, the industrial design profession has emerged with the need for a new field of study for the design of products. Products are produced by deciding in advance how long they will be used as a sales strategy. Industrial designers, on the other hand, are included in the system by creating designs that have limited life and repair possibilities.

As a result of literature research, it has been determined that there is a relationship between the discipline of industrial design and planned obsolescence strategies. However, there are few studies written on this subject. For this reason, it was decided to conduct a case study to analyze the relationship. The study basically serves the following questions:

- Is there a relationship between planned obsolescence strategies and industrial design processes?
- Are planned obsolescence strategies effective in the design processes of bagless vacuum cleaners in the Turkish local market?
- What types of planned obsolescence can be used in bagless vacuum cleaner designs?

In this study, firstly, a literature review on planned obsolescence is presented. Then, a case study with bagless vacuum cleaners is included. A matrix method was used to analyze the study and the results were analyzed. In the final, findings and discussions are given.

1.1. Planned Obsolescence

Planned obsolescence is a notion that emerged after a major crisis known as the “Great Depression”. This term was first written by Bernart London in 1932 in the article "Ending the Depression Through Planned Obsolescence". London (1932) argued that a legal period should be set for each product and if this period expires, the products should be destroyed by the relevant institutions [2]. One of the first known cases of planned obsolescence dates back to the 1920s, when a group of manufacturers known as the Phoebus cartel agreed to limit the life of light bulbs to 1000 hours of operation [3]. Another case is seen in women's socks produced by DuPont company. While this company, which produced the first nylon socks in the market, was known for its durability, later the durability of the socks was reduced and consumers were enabled to purchase new products [4]. The phrase “Instilling in the buyer the desire to own something a little newer, a little better, a little sooner than is necessary” coined by Brooks Stevens in 1960 sums up what planned obsolescence means [5]. Planned obsolescence was discussed by Packard in 1960 as an unethical strategy for designing products that wear out inopportune. In the article written by Vince Packard in 1960, which is another important study on Planned Obsolescence, the types of the concept of planned obsolescence were also revealed. These are included in the literature as obsolescence of desirability, function and quality. In quality obsolescence, a product's useful life ends early due to technical problems, while in cases where desirability and function are obsolete, the product still continues to work flawlessly [6].

The main objective of planned obsolescence is to shorten the natural life of the existing products and to force consumers to purchase new products [7]. This strategy can be carried out by companies both intentionally and indirectly. Cooper (2004), examined the concept of planned obsolescence under three sub-headings: psychological, economic and technological obsolescence. The technological obsolescence occurs when new functions are added to products and new information is obtained about other products. The psychological obsolescence type emerges when there is a change in the perspectives of consumers towards their needs, when new and different designs enter the market, as well as with the effect of advertisements and fashion [2]. The economic obsolescence may occur when the cost of repairs and spare parts prices are high and energy savings are not achieved [8].

Planned obsolescence, as a material and cultural paradigm created by the capitalist mode of production, is one of the most successful practices that trigger market driven consumption [9]. This is a business strategy for planning the obsolescence process of a product before it is released. It is also a strategic arrangement for the planning, design, manufacture, and manufacture of goods with a limited service life [10]. Making the continuity of production essential depends on consumption and, accordingly, the destruction of the existing product [11]. That is to say, businesses plan their production mechanisms according to the wear of the products within a certain timeframe [12].

There are several types of planned obsolescence due to the different methods used to shorten the consumption time of a particular product [13]. In this article, obsolescence types that are common in many studies in the literature and associated with the design discipline have been determined. The types of obsolescence considered are psychological, functional, and systematic obsolescence (Figure 1).

Psychological obsolescence is a type of obsolescence that occurs when consumers are no longer satisfied [8]. Packard, on the other hand, argued that psychological obsolescence manipulates the consumer [14]. The concept of ‘wear out’ has begun to be used as a newly discovered psychological obsolescence as a means of influencing consumer spending [1]. Functional obsolescence is defined by Packard as a product that performs the same function as before, but operates more efficiently [14]. This type of obsolescence can be applied by limiting the service life, reducing material quality, and incurring high repair costs [2]. As an example of limitation of service life, printers are limited to print a certain number of pages [15]. Systematic obsolescence, on the other hand, is realized by creating a need in the consumer and putting the next versions of the products on the market at certain intervals [2]. This type of obsolescence strategy is applied especially in sectors dominated by technology such as electronics, white goods, and small household appliances.

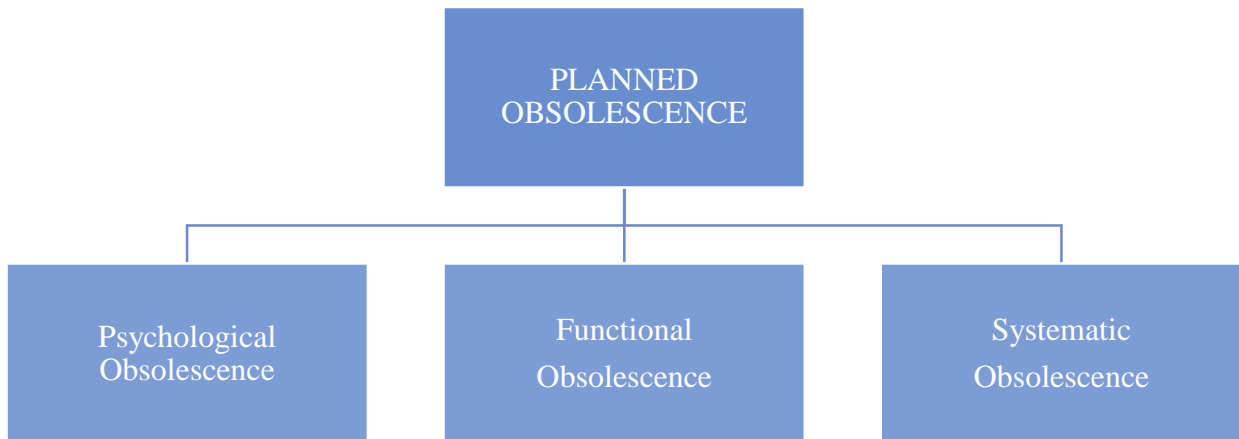


Figure 1: Types of planned obsolescence.

1.2. Industrial Design and Planned Obsolescence

Consumption is an important element for the continuity of industrial production. According to Bocock (2009), consumption is defined as a series of experiences with economic, social, cultural and psychological inputs on a societal scale [16]. Bocock emphasises that traditional capitalism has turned into the new consumer capitalism. However, the concept of consumption has also undergone a change in meaning. With the development of production and material technologies, production has industrialized and consumer societies have begun to form. A consumer society is a social structure in which the desire to possess is at an extreme [17]. In the consumer society, consumption exceeds the limit of products and services that meet basic needs. With the consumer society, the need for a new workspace to design products and systems has emerged, and thus the industrial design profession has emerged. Industrial Design is defined by IDSA (Industrial Designers of Society of America) as a professional practice that designs products, devices, objects and services with a primary focus on their physical appearance, functionality and manufacturability [18]. Bayazit (2008) stated that the concept of Industrial Design was first used by the American industrial designer Joseph Sinel in 1919 [19]. With the development of technology, the need for industrial design has increased. Modern design has become a symbol of economy and political power as well as rationality and progress [20]. While product design sometimes means the creation and realization of brand new product ideas, sometimes it is a make-up activity for the differentiation of the product in the market [21].

With the planned obsolescence, many products have started to be put back on the market with minor changes in their designs [22]. Designers create the consumption impulse even if the consumer does not need it [20]. By changing the style of products, designers are designing to make the old version disposable [23]. Redesigning products in style and creating an old perception for the previous version can be an example of psychological obsolescence. In order to increase consumption, products are produced by deciding how long they will be used during the design process. Industrial designers design based on limited functional life design, design for limited repair, and the creation of new needs [7]. Many products have started to be produced in such a way that it is not possible to repair and upgrade their technologies [22]. In addition, designing and launching new models of products at regular intervals demonstrates a systematic obsolescence strategy. Considering all these, it is seen that the need for the industrial design profession has increased with the development of the consumer society and it serves the planned obsolescence strategy.

2. METHOD

The main purpose of this study is to examine whether the planned obsolescence strategy is effective in bagless vacuum cleaner designs which are produced in the local market of Turkey. The reason for working on the vacuum cleaner product is the user survey to determine the type of product to be researched. In the

survey participated by 125 users, the participants were asked which product they changed most frequently, and 59.2% of the participants were given a vacuum cleaner response (Figure 2). In addition, the main reason for working in the dust bagless vacuum cleaner category is that the brands mostly work on this type of product.

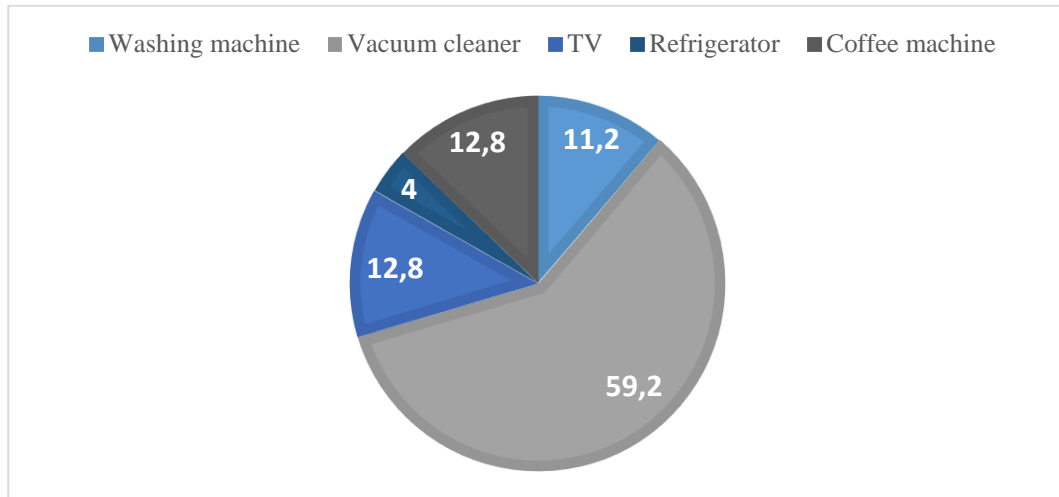


Figure 2: User survey results.

For this purpose, first of all, literature research was conducted. Afterwards, preliminary research was carried out in the local market. All the companies that dominate the market were determined and the product ranges of the companies were examined. The first factor in determining the companies to be included in the research was the excess of product variety (Table 1).

Table 1: Companies and amount of product variety.

	Bag Vacuum Cleaners	Bagless Vacuum Cleaners	Cordless Stick Vacuums	Stick Vacuums	Ultra Quiet	Water Filter Vacuum Cleaner	Wet and Dry	Carpet Washing	Robot	Total
X	4	4	6	1	0	0	1	0	1	19
Y	5	18	0	6	0	5	2	3	0	39
Z	7	5	1	9	2	3	9	5	1	42
W	4	9	1	3	0	0	0	0	1	18
Q	4	4	3	0	0	0	0	0	1	12
K	10	11	5	8	0	0	0	3	4	41
L	4	4	6	1	0	0	1	0	1	19
M	1	9	2	0	0	0	0	0	0	12
N	0	3	8	0	0	0	0	0	0	11
P	3	2	0	2	0	0	0	0	0	7
R	1	4	1	0	0	0	1	0	0	7
	43	73	33	30	2	8	14	11	9	

Then, the sales volumes of local companies in the market were compared (Table 2). The high sales rate was another impressive factor in determining the firm. As a result of the researches, unstructured interviews were conducted with five prominent companies.

Table 2: Sales volumes of companies.

CATEGORY	BRAND	COMPANY NAME	2019	2020
Total			100,00	100,00
Vacuum Cleaner	Arçelik	Arçelik AŞ	11,80	11,70
Vacuum Cleaner	Fantom	Fanset Elektrikli Ev Aletleri San ve Tic AŞ	10,90	10,80
Vacuum Cleaner	Arnica	Senur Elektrik Motorları San ve Tic AŞ	7,40	7,40
Vacuum Cleaner	Arzum	Arzum Elektrikli Ev Aletleri San ve Tic AŞ	4,20	4,20
Vacuum Cleaner	Beko	Arçelik AŞ	3,50	3,50
Vacuum Cleaner	Vestel	Zorlu Holding AŞ	1,00	1,10
Vacuum Cleaner	İhlas	İhlas Pazarlama AŞ	0,60	0,60
Vacuum Cleaner	Altus	Arçelik AŞ	0,40	0,40

Finally, interviews were held with companies. In the surveys, 13 questions were asked to the participants. Survey questions were completed by the companies' R&D managers or industrial design managers. In addition to the interviews, detailed analyzes were made on the products that the selected companies have offered to the market in the last 5 years (Table 3).

Table 3: Technical specifications of the products.

Technical Specifications						
Brand	Product Name	Year of Production	Power	Filter	Dust Container Volume	Noise in Decibels
X	X1	2019	450 W	HEPA13	3 L	63 dB
X	X2	2019	800W	HEPA13	3 L	70 dB
X	X3	2018	750 W	HEPA13	3 L	69 dB
Y	Y1	2021	750 W	HEPA13	3 L	74 dB
Y	Y2	2020	750 W	HEPA13	3 L	70 dB
Y	Y3	2017	750 W	HEPA13	2,5 L	75 dB
Z	Z1	2019	850 W	HEPA13	4,5 L	85 dB
Z	Z2	2014	850 W	HEPA13	2 L	78 dB
W	W1	2021	899 W	HEPA13	2,2 L	71 dB
W	W2	2019	899 W	HEPA13	2,2 L	71 dB
W	W3	2018	899 W	HEPA13	2,2 L	72 dB
W	W4	2018	899 W	HEPA13	2,2 L	65 dB
Q	Q1	2020	750 W	HEPA13	2,7 L	75 dB
Q	Q2	2020	750 W	HEPA13	2,7 L	66 dB
Q	Q3	2021	750 W	HEPA13	2,7 L	66-70 dB

Reviews about the technical specifications and technical components of the products have been transferred to the table (Table 4). The names of the companies examined in the table are coded with X, Y, Z, W and Q due to company confidentiality. Also, user comments for each product were examined and problems were identified.

Table 4: Technical component comparison of products.

		PRODUCT TYPE														
		DUST BAGLESS														
BRAND		X1	X2	X3	Y1	Y2	Y3	Z1	Z2	W1	W2	W3	W4	Q1	Q2	Q3
PRODUCT COMPONENTS	Dust container emptying button	✓	✓	✓	X	X	X	X	X	✓	✓	✓	✓	X	X	X
	Carrying handle	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓
	Suction Power Adjustment Button	✓	✓	✓	✓	✓	✓	X	X	✓	✓	✓	✓	✓	✓	✓
	Suction power indicator	✓	X	X	✓	X	✓	X	X	✓	✓	X	✓	X	✓	✓
	Cable rewind button	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Carpet/parquet brush parking channel	✓	✓	✓	✓	✓	✓	X	X	✓	✓	✓	✓	✓	✓	✓
	On/off button	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Dust container release button	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Dust container	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Suction nozzle	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Hose nozzle	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Hose	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Carpet/parquet brush	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Telescopic tube	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Handle	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Extra Brushes	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Air outlet filter	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Sponge filter	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X	X
	Remote trigger	✓	✓	X	✓	X	✓	X	X	✓	✓	X	X	X	X	X
	Cyclone Filter	✓	✓	✓	X	X	X	✓	✓	✓	✓	✓	✓	X	X	X
Vortex Apparatus	X	X	X	✓	✓	✓	X	X	X	X	X	X	X	X	X	

3. RESULT

As a result of the literature research, preliminary research and field studies, a matrix was created for psychological and functional planned obsolescence type. The notions associated with each obsolescence

type were determined to create the matrix. These notions have been chosen to be related to the design discipline.

The first table is about psychological obsolescence (Table 5). Although there is no technical or stylistic change in the product, the product is perceived as old. Most of the time, products are introduced in the market as a new and different model with minor changes in style. In order for a product to become psychologically obsolete, it is ensured that the user's perceptions of that product are worn out. For this reason, design concepts affecting the product style were determined to examine psychological obsolescence. Firstly under the title of psychological obsolescence, volume, geometry, color, pattern, texture and usage subheadings were determined. These topics were handled separately for the bagless vacuum cleaner models of each brand. For each model, it was analyzed in the light of the researches whether there was a difference between the previous model that was introduced to the market. If there is any difference between the two models, it is evaluated with a score of 1, if there is no difference, it is evaluated with a score of 0 in the matrix. Total results are scored. In the rating, those who scored 6, 5 and 4 within 6 headings were concluded as high, 3 points as medium, 2, 1 and 0 points as low. As it progresses from high to low, the probability of implementing a planned obsolescence strategy increases inversely.

Table 5: Matrix of psychological obsolescence

Psychological Obsolescence									
Brand	Product Name	Volume	Geometry	Color	Pattern	Texture	Usage	Total	Grade
X	X1	0	0	1	0	0	0	1	Low
X	X2	0	0	1	0	0	0	1	Low
X	X3	0	0	1	0	0	0	1	Low
Y	Y1	0	0	1	0	0	0	1	Low
Y	Y2	0	1	1	0	0	0	2	Low
Y	Y3	0	1	1	0	0	0	2	Low
Z	Z1	1	1	1	0	0	0	3	Medium
Z	Z2	1	1	1	0	0	0	3	Medium
W	W1	0	0	1	0	0	0	1	Low
W	W2	0	0	1	0	0	0	1	Low
W	W3	0	0	1	0	0	0	1	Low
W	W4	0	0	1	0	0	0	1	Low
Q	Q1	0	0	1	0	0	0	1	Low
Q	Q2	0	0	1	0	0	0	1	Low
Q	Q3	0	0	1	0	0	0	1	Low

When industrial design contexts are examined in the type of psychological obsolescence, the result is below average for most brands, indicating that these brands are inclined to implement the psychological obsolescence strategy. Out of 5 brands, only 1 resulted in mid-level and the others in low-level. While changes are observed in the context of color in all brands, dominant changes are not observed in other contexts. According to the results obtained from the interviews, most of the brands keep aesthetics and function at the same level. A brand stated that vacuum cleaners have been exhibited in homes as an exhibition element in recent years and their design is important. For this reason, they stated that its design and aesthetics have come to a point as important as performance. However, when we look at the products in the market, it is seen that the brands produce similar products in the same product category, mostly in terms of design. As a result, it can be argued that new models of the products were regularly introduced and the previous model was made an "old product".

In the second table, the functional obsolescence type is discussed. As in the first table, design subheadings that may affect the design of the products have been determined. Technical features have been taken into account in the titles determined to examine the functional obsolescence type. These titles are function, power, noise, form, material and technical support. Scoring was made and concluded in this table, based on the same evaluation criteria as the first table.

Table 6: Matrix of functional obsolescence

Functional Obsolescence									
Brand	Product Name	Function	Power	Noise	Form	Material	Technical Support	Total	Grade
X	X1	1	1	1	0	0	1	4	High
X	X2	1	1	1	0	0	1	4	High
X	X3	0	0	0	0	0	1	1	Low
Y	Y1	1	1	0	0	0	1	3	Medium
Y	Y2	1	1	0	1	0	1	4	High
Y	Y3	0	0	0	1	0	1	2	Low
Z	Z1	0	0	0	1	0	1	2	Low
Z	Z2	0	0	0	1	0	1	2	Low
W	W1	1	0	0	0	0	1	2	Low
W	W2	0	0	1	0	0	1	2	Low
W	W3	0	0	1	0	0	1	2	Low
W	W4	0	0	1	0	0	1	2	Low
Q	Q1	0	0	1	0	0	1	2	Low
Q	Q2	0	0	1	0	0	1	2	Low
Q	Q3	0	0	1	0	0	1	2	Low

In functional obsolescence, it is observed that most brands remain below the average in this type of obsolescence, as in psychological obsolescence. 2 products from brand X and 1 product from brand Y resulted in high levels. It can be argued that these products are not subject to a functional obsolescence strategy compared to others. When the answers from the interview questions are examined, it is seen that all brands have a positive approach to technical support. It is among the answers that a brand attaches importance to the use of long-lasting materials. It has been observed that 60% of the brands attach importance to sustainability by using recyclable materials. While 60% of the brands said that they had their suppliers produce all of their products, 40% stated that they produced some parts themselves. The causes of technical problems of brands may be suppliers or technological inadequacies.

In order to conduct research on systematic obsolescence, some questions were asked to the managers in the interviews and the answers were analyzed. In this obsolescence method, a matrix is not created. Its relationship with the design discipline was evaluated by looking at the results of the research. Information on how often brands design new models and how often they introduce new models to the market is obtained (Figure 3). In addition, the new product design inputs of the brands were learned and the differences between the last product and the previous product were asked to the managers. The answers of the managers were "only the form was studied", "improvements were made", "energy efficiency was studied over the existing product".

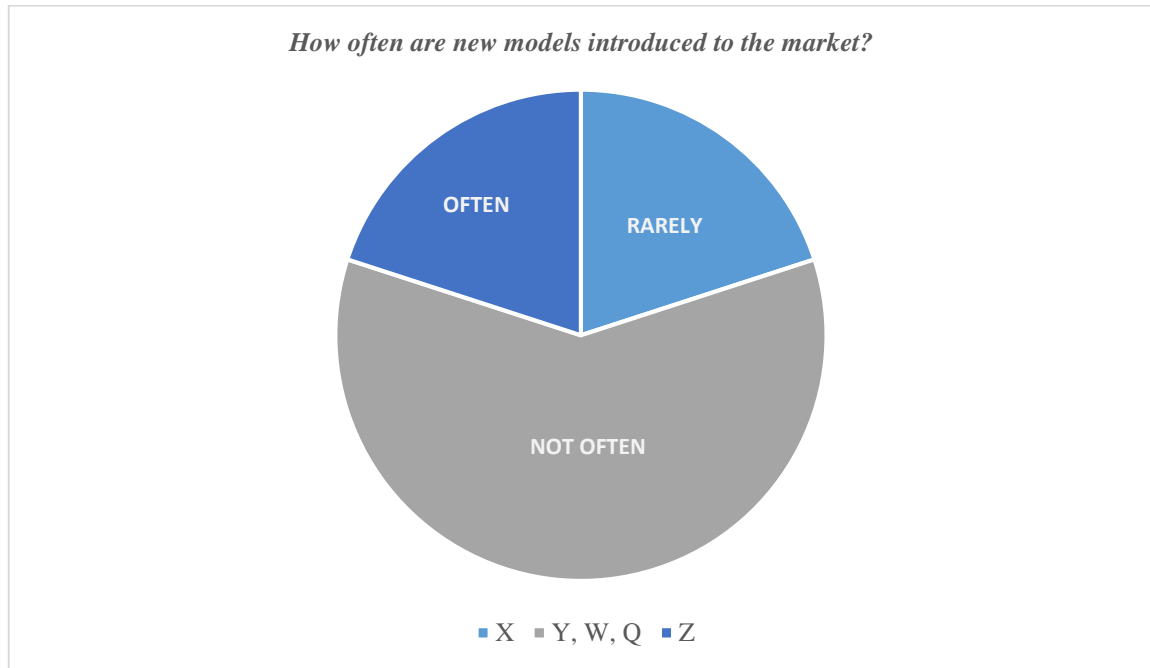


Figure 3: Survey results

4. DISCUSSIONS AND CONCLUSION

As a result of the great depression crisis that started in 1929, it was decided to work to increase consumption. Thus, planned obsolescence strategies started to be implemented in the market and the foundations of the consumer society were laid. In order to increase the demand, the need for design has also increased. Collaboration with industrial designers was carried out in order to implement planned obsolescence strategies. For the purpose of making the products more attractive and to create new offerings, with minor changes were made to their designs and these products were introduced to the market as new models. At the same time, industrial designers have been given some responsibilities in the obsolescence of the functional and technical features of the products.

Planned obsolescence, which is still used as a sales strategy today, benefits from the collaboration of many professions such as engineering, industrial design, and marketing. Product design processes are carried out in a planned manner, depending on the company's decisions, especially in sectors such as electronics and white goods. In this study, detailed analyzes were made on the vacuum cleaner, which was determined as the most frequently changed household appliance in Turkey by the users as a result of the questionnaire made to 125 users. In these reviews, the technical features and components of the products are primarily taken as a basis. In addition, 13 open-ended questions on the planned obsolescence strategy were asked to the managers of the selected brands. As a result of the information obtained, two matrix tables were created depending on the planned obsolescence types based on the study. These matrices reveal the relationships between obsolescence and design discipline contexts. While psychological obsolescence and functional obsolescence types are seen to be directly related to the industrial design discipline, the systematic obsolescence type is dominantly influenced by other disciplines such as engineering and marketing, as well as the design discipline. For this reason, a matrix table of this obsolescence type has not been created.

When the matrices were examined, it was observed that different results emerged in both matrices. It is possible to say that psychological obsolescence strategies are used at a higher rate in bagless vacuum cleaner products than functional obsolescence. In systematic obsolescence, the evaluation criterion is that brands frequently introduce new models to the market. For this purpose, managers were asked how often they introduced new products to the market during the interviews. In vacuum cleaner products, it was concluded that only one brand frequently introduced new models to the market, while three brands produced new models with moderate frequency. Considering the 5 different brands and 3 different obsolescence types

examined, it can be claimed that the brands use at least 1 obsolescence strategy as a result of the data obtained. Accordingly, it is possible to conclude that planned obsolescence strategies are effective in the design processes of bagless vacuum cleaner products in the Turkish local market.

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