

## An Analytical Approach for Cabinet Door Type Selection in Kitchen Design

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### ABSTRACT

*A functional and comfortable kitchen design can only be gained by creating solutions which are in compliance with the needs of person or people to use the kitchen. User needs are all conditions which support humans to continue their lives without being disturbed by physiological, social and psychological aspects. The most important decisions, which must be given right in order to design kitchen project in compliance with the user needs, are the kitchen layout and cabinet door type. Within the scope of study, these two main design decisions were determined firstly and the question, whether there is a meaningful relation between them and if any, what kind of relation, was asked. As result of the literature research made for finding an answer for this question, many design tips on the determination of cabinet door type or kitchen layout were obtained but a scientific data showing whether there is a relation between these two design decisions was not obtained. In this context, the study's scope and purpose were determined as to obtain statistical data describing the mathematical relation between the cabinet door type and kitchen layout and to present the results belonging to these data as a data analysis table. As the methodology of the study, all kitchen layouts were determined at the first stage. At the next stage, cabinet door types to be examined within the study were described. Then 1.309 real kitchen projects were examined for obtaining the statistical data showing the relations between these cabinet door types and kitchen layouts. At the last stage, the mathematical relations between the statistical data obtained as result of these examinations were described as a meaningful data analysis. The selection for the closet cover type shall be made in a more competitive way with the kitchen layout by using this data analysis table obtained. Besides, it shall be possible to know which cabinet door type is mostly preferred by the users with the aid of this data analysis table and this information shall help the sample modelled company to determine its product stock amounts in a more proper way and it shall decrease the production time of the kitchen.*

**Keywords:** Cabinet door type, kitchen layout, interior architecture

### INTRODUCTION

A functional and comfortable kitchen design can only be gained by creating solutions which are in compliance with the needs of person or people to use the kitchen. User needs are all environmental and social conditions which support humans to continue their lives without being disturbed by physiological, social and psychological aspects. In other words, they determine the minimum qualifications which a place must have. Deficiencies in these qualifications create discomfort in the user (Bağcı, 2005). User requirements are divided into two groups mainly as physical and psycho-social (Kıran and PolatoğluBaytin, 2006). Physical user requirements are classified as spatial, thermal, acoustic, visual and health and safety requirements. Psycho-social user requirements are private, behavioral, social and aesthetic needs (Arcan and Evci, 1992).

Firstly the kitchen layout must be determined truly in order to make the kitchen design in compliance with the physical user requirements. The reason of this is the fact that the most important factor effecting the process method of kitchen working like a machine is the kitchen layout. For example, there is linear movement between the activity areas of a single wall type and this movement turns into activities made between the corners of a triangle in U type kitchen (Conran, 2005).

For the kitchen design to be made in accordance with the psycho-social user requirements, firstly the aesthetic appearance and the style must be in accordance with the life style of user. For example, a modern design is appropriate for the users who love order and organization and give importance to pureness and the country style designs are more appropriate for the people who like places which evoke the past forms and create a traditional country house sense, when making decision about the style of kitchen (Yazıcıoğlu, 2010). The most important decision to be given by the user to be in compliance with the demanded style is cabinet door type. Because the style of the kitchen can be completely changed by changing the cabinet door type in a kitchen designed in the same way. In other words, for creating the atmosphere in compliance with the style reflecting the life style of the user, it is very important to make right decision in the selection of cabinet door type.

In this context, the most important decisions, which must be given right in order to design kitchen project in compliance with the user needs, are the kitchen layout and cabinet door type (in other words, the type of the kitchen style).

In this point within the scope of study, these two main design decisions were determined firstly and the question, whether there is a meaningful relation between them and if any, what kind of relation, was asked. A literature research was made for answering this question (Asensio and Ubach, 2003; Baden-Powell, 2005; Beamish, 2013; Beazley, 1999; Bouknight, 2013; Brunk et.al. 2003; Calley, 2007; Cerver, 2006; Clark, 2003; Conran, 2002; Cool Springs Press, 2013; Goldberg, 2012; Grey, 2002; Hufnagel, 1991; Jankowski, 2001; King, 2006; Lovett, 2006; Maney, 2003; McLellan, 2003; Meyer and Roth, 2007; Mielke, 2005; Rand and Perchuk, 1991; Sweet, 2003; Taylor, 2003; Veilette, 2007). As result of the research made for finding an answer for this question, many design tips on the determination of cabinet door type or kitchen layout were obtained but a scientific data showing whether there is a relation between these two design decisions was not obtained.

## **PURPOSE AND METHODOLOGY**


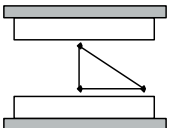
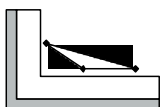

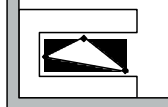
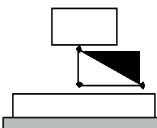
The study's scope and purpose were determined as to obtain statistical data describing the mathematical relation between the cabinet door type and kitchen layout and to present the results belonging to these data as a meaningful data analysis table for supporting the designer in giving right decisions. As per these described scope and purpose, as the methodology of the study, a literature research shall be made for determining all kitchen layouts at the first stage. At the next stage, cabinet door types to be examined within the study shall be described. After that, in order to obtain the data showing the relations between these cabinet door types and kitchen layouts, 1.309 real kitchen projects shall be examined for obtaining the statistical data showing the relations between these cabinet door types and kitchen layouts. At the last stage of study, the mathematical relations between the statistical data obtained as result of these examinations shall be described as a meaningful data analysis.

## **TYPES OF KITCHEN LAYOUT**

In the literature survey of how types of kitchen layout could be defined in the model we learned that King (2006), as single line, gallery, L-shaped, U-shaped, peninsula and island;

Jankowski (2001), as L-shaped, U shaped, gallery, peninsula and island; Beazley (1999), as one-wall gallery, two-wall gallery, L-shaped, U-shaped and island; Lovett (2006), as one-wall, gallery, L-shaped, U-shaped, peninsula and island; Asensio and Ubach (2003), as linear, L-shaped, U-shaped and island; Baden-Powell (2005), as in-line, gallery, L-shaped, U-shaped and island. A study of types of layout that are defined differently in other sources showed that these could be grouped as indicated in Table 1 (Yazıcıoğlu, 2012; Yazıcıoğlu, 2014).

**Table 1. Types of kitchen layout**

<i>One wall</i>	<i>Corridor</i>	<i>L shaped</i>	<i>U shaped</i>	<i>Peninsula</i>	<i>Island</i>
One-wall gallery Single line Linear In line	Two-wall gallery Gallery				
The type of kitchen designed so that the main areas of activity are along one wall.	The type of kitchen designed so that the main areas of activity are along two opposite walls.	The type of kitchen designed so that the main areas of activity are along two intersecting walls.	The type of kitchen designed so that the main areas of activity are along the three walls of the kitchen.	The type of kitchen designed so that part of the counter is detached from the wall taking the shape of a peninsula.	The type of kitchen designed so that one or more of the main areas of activity are at the center of the room.
					

The investigation of the 1.309 projects used within the scope of this study showed that types of layout given in Table 1 were the only ones utilized and there seemed to be no application of another type (Yazıcıoğlu, 2012; Yazıcıoğlu, 2014).

**CABINET DOOR TYPES**

When the cabinet door types of kitchen producer and seller companies in the sector, it was seen that these cabinet door types have so much variety that it can be stated by hundreds. The cabinet door types whose relation with the kitchen layout will be examined in the study will be the cabinet door types of the company which was taken as model. The reason of this is that 1.309 kitchen projects from which the statistical data will be obtained were designed with only the products belonging to this company. These cabinet door types are as shown in Table 2.

**Table 2. Cabinet door types**

Name	Description
D1	Laminated chipboard (Juglans, Lime oak, Natural, Leandro walnut, Teak)
D2	Laminated MDF (Framed Italian walnut, Framed natural)

- D3 Matte PVC-polyester coated MDF (Vanilla, Tobacco)
- D4 MDF veneered with matte PVC-polyester combination (Ecrú)
- D5 Chipboard veneered with textured PVC-polyester combination (Smartlam cacao, Smartlam natural oak, Smartlam white)
- D6 MDF veneered with matte PVC-polyester combination (White)
- D7 Solid wood door (Chestnut)
- D8 Solid wood door (Walnut)
- D9 MDF veneered with glossy PVC-polyester combination (High glossy zebrano, High glossy ebony)
- D10 MDF veneered with glossy PVC-polyester combination (High glossy coffee, High glossy cappuccino, High glossy white, High glossy vanilla, High glossy burgundy, High glossy black)
- D11 MDF membrane veneered (Refined oak)
- D12 MDF membrane veneered (Refined walnut)
- D13 Solid wood door (Oak, Venge)
- D14 MDF glossy varnish (Apple green)
- D15 Solid wood door (Cherry)

**OBTAINING THE STATISTICAL DATA SHOWING THE RELATION BETWEEN CABINET DOOR TYPES AND KITCHEN LAYOUT**

In order to obtain the statistical data showing the relations between the cabinet door type determined in Table 2 in the previous stage of the study and kitchen layout in Table 1, 1.309 real kitchen projects provided from a company having agencies in different cities in Turkey were examined by using an architectural CAD software named ArchKitchen. The reason why ArchKitchen software was preferred in this study is that the company uses the same software in its project presentations and orders and all kitchen projects of the company are present as 3D in the software. Therefore, data collection works were made in computer environment by using ArchKitchen software and an important time was saved in this way. As result of these examinations, the data distribution showing the usage amounts of cabinet door types in 1.309 kitchen projects were shown as in Figure 1.

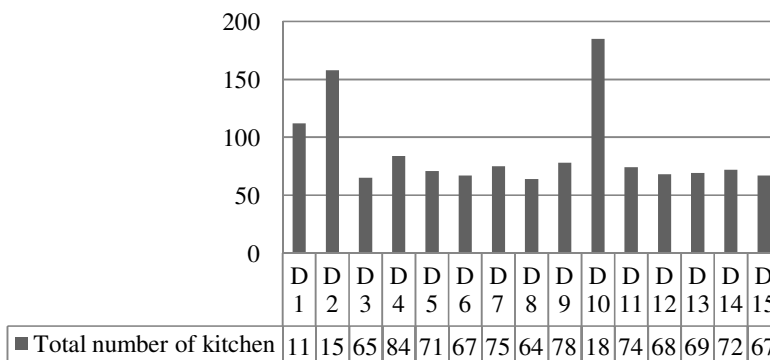


Figure 1. Data distribution belonging to the cabinet door types' usage in kitchen projects

When the data in Figure 1 are examined, it was seen that the cabinet door types which are used the most in kitchen designs were D10 with the rate of 14% and D2 with the rate of 12%.

And the results in Figure 2 were obtained when the data showing the usage amounts of cabinet door types according to the kitchen layouts upon 1.309 real kitchen projects.

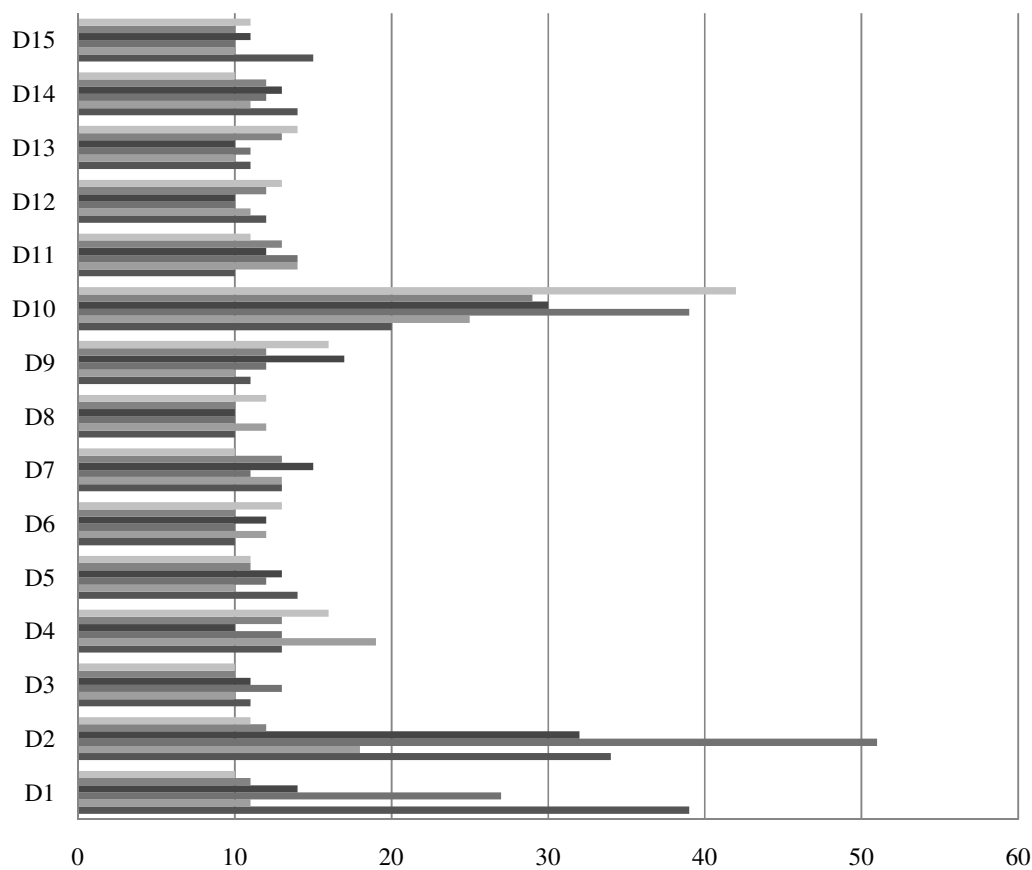


Figure 2.Data distribution according to the kitchen layouts of cabinet door types

In this stage of the study, in order to make the numeral figures in Figure 2 more meaningful that the designer can take advantage of them in cabinet door type selection, cabinet door types usage rates were analyzed separately for each kitchen layout. Proportional values in Figure 3 were obtained as result of these analyses.

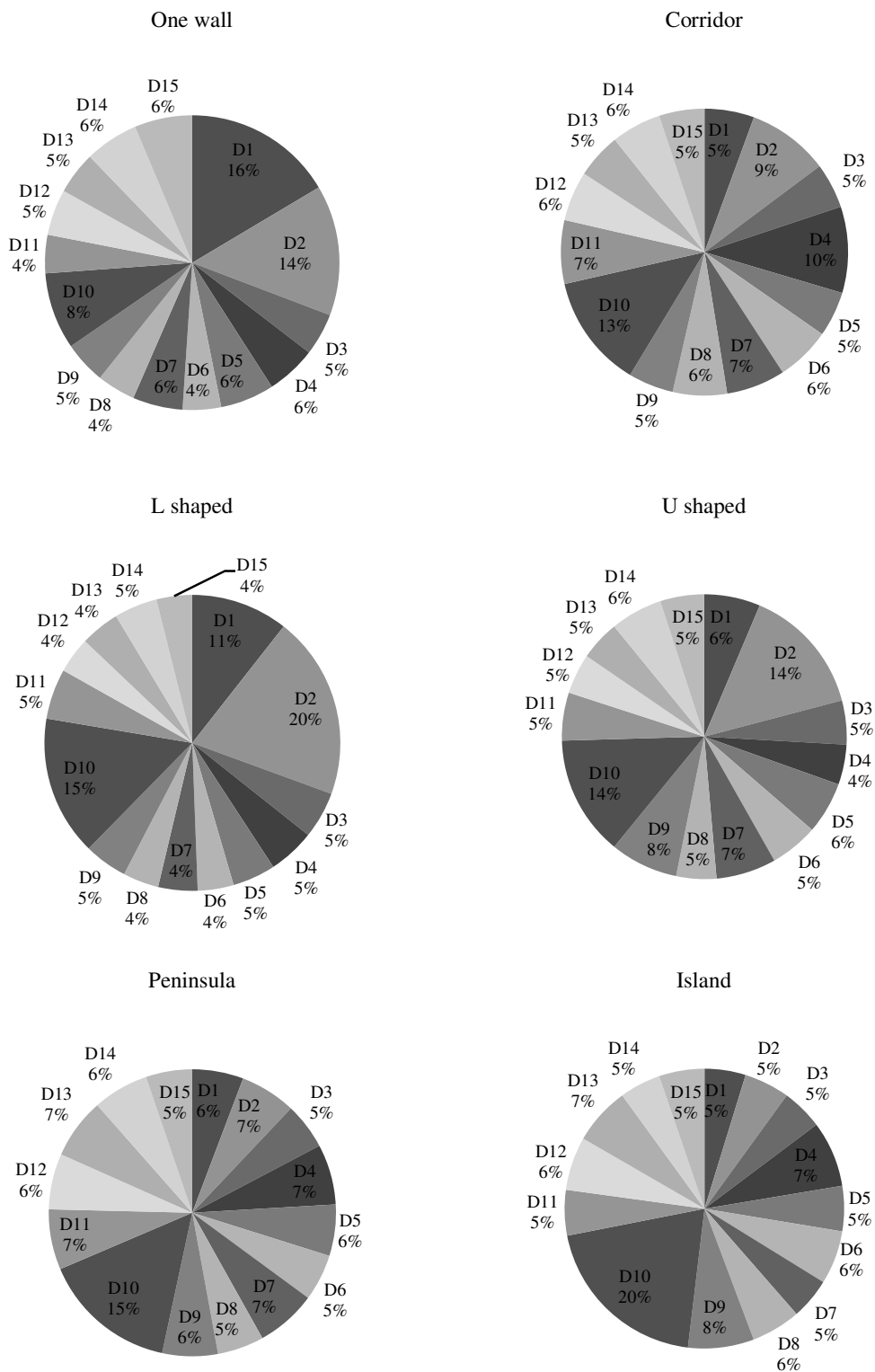


Figure 3. Usage amounts according to the kitchen layouts of cabinet door types

All these statistical results obtained as result of the study can help the designer in selection of cabinet door type. When the cabinet door type is determined by the designer, the designer shall be able to see the kitchen layout which this cabinet door type belongs to. Because of this, all statistical results obtained in the next stage of this study shall be interpreted in a systematic way and they shall be turned into a meaningful data analysis table.

### CREATING THE DATA ANALYSIS TABLE SHOWING THE RELATION BETWEEN CABINET DOOR TYPE AND KITCHEN LAYOUT

The statistical results in Figure 1 and Figure 3 showing the relation between the kitchen layout and cabinet door type obtained from 1,309 real kitchen projects was interpreted in a systematic way and they were turned into a data analysis table which the designer can use when selecting cabinet door type (Table 3).

**Tablo3. Gives the designer could benefit analysis when choosing the cabinet door type**

<i>Kitchen layout</i>	<i>Data Analysis</i>
Onewall	The most preferred cabinet door types are D1 by 16% and D2 by 14%. The least preferred cabinet door types are D6, D8 and D11 by 4%. D1 and D2 cabinet door types are used with an average of 1/3 in all of the onewall types of kitchens.
Corridor	The most preferred cabinet door types are D10 by 13% and D4 by 10%. The least preferred cabinet door types are D1, D3, D5, D9, D13 and D15 by 5%. D4 and D10 cabinet door types are used with an average of 1/4 in all of the corridor types of kitchens.
L shaped	The most preferred cabinet door types are D2 by 20%, D10 by 15% and D1 by 11%. The least preferred cabinet door types are D6, D7, D8, D12, D13 and D15 by 4%. D2, D11 and D10 cabinet door types are used with an average of 1/2 in all of the L shaped types of kitchens.
U shaped	The most preferred cabinet door types are D12 by 14% and D10 by 14%. The least preferred cabinet door type is D4 by 4%. D10 and D12 cabinet door types are used with an average of 1/3 in all of the U shaped types of kitchens.
Peninsula	The most preferred cabinet door type is D10 by 15%. The least preferred cabinet door types are D3, D6, D8 and D15 by 5%.
Island	The most preferred cabinet door type is D10 by 20%. D10 cabinet door type is used with an average of 1/4 in all of the island types of kitchens.
All kitchen layouts	The most preferred cabinet door types are D10 by 14% and D2 by 12%. When all types of kitchens are examined separately it is found that D1 is used within the range of 5% to 16%. When all types of kitchens are examined separately it is found that D2 is used within the range of 5% to 20%. When all types of kitchens are examined separately it is found that D3 is used by 5%. When all types of kitchens are examined separately it is found that D4 is used within the range of 4% to 10%. When all types of kitchens are examined separately it is found that D5 is used within the range of 5% to 6%. When all types of kitchens are examined separately it is found that D6 is used within the range of 4% to 6%. When all types of kitchens are examined separately it is found that D7 is used within the range of 4% to 7%. When all types of kitchens are examined separately it is found that D8 is used within the range of 4% to 6%. When all types of kitchens are examined separately it is found that D9 is used within the range of 5% to 8%. When all types of kitchens are examined separately it is found that D10 is used within the range of 8% to 20%. When all types of kitchens are examined separately it is found that D11 is used within the range of 4% to 7%. When all types of kitchens are examined separately it is found that D12 is used within the range of 4% to 6%. When all types of kitchens are examined separately it is found that D13 is used within the range of 4% to 7%. When all types of kitchens are examined separately it is found that D14 is used within the range of 5% to 6%. When all types of kitchens are examined separately it is found that D15 is used within the range of 4% to 6%.



## RESULTS

The selection for the closet cover type shall be made in a more competitive way with the kitchen layout by using the data analysis table describing the statistical relation between the cabinet door type and the kitchen layout and which was obtained during the study. For example; the designer shall be able to see that the mostly preferred cabinet door types are D1 and D2 and the least preferred ones are D6, D8 and D11 by looking at the data analysis table. Besides, it shall be possible to know which cabinet door type is mostly preferred by the users with the aid of this data analysis. For example; the most preferred cabinet door types are D10 with the rate of 14% and D2 with the rate of 12% within 1.309 kitchen projects. This information shall help the model company to determine its product stocks in a right way and therefore it shall decrease the kitchen's production time and the delivery time to the customer.

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