



DESIGN OF SMALL SQUARE METERS HOUSING THROUGH INTERIOR ARCHITECTURE

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ABSTRACT

The phenomenon of shelter has been among our basic needs for various reasons, and hundreds of years ago this need has led to the concept of "housing". Being nomadic and need oriented at the beginning, the housing and its residential design process coincide with the historical development of the people and extend to the present by including the concept of architecture. Small square meters living spaces/mobile spaces utilize the technology in every field from the design stage to presentation techniques, manufacturing and application methods. In this way, it was possible to use many new materials in the field of application and even many new artificial materials were produced, as a result, longer life, more robust, more functional products and spaces could be obtained in a shorter time with much less labor. As a result of the developments, small square meter / mobile housing concept has been improved. Introduction to the concept of small housing is an indispensable phenomenon for today's technology and human / space needs.

Anahtar Kelimeler: Design, housing, small house, Mobile house.

INTRODUCTION

The number of dwellings has increased uncontrollably in order to meet the housing needs for years. The search for differences in housing types has started with the differences in the preferences of the users, economic factors and changes in the social life of individuals. Different types of dwellings are derived primarily as dwellings with different number of rooms. However, for economic reasons, not everyone could choose a house with a number of rooms in line with their needs. Considered as a commercial investment tool, the prices of houses increased as the number of rooms increased and individuals who could not have the economic power to buy a house had to accommodate in smaller houses than their own needs or in the form of housing that was built irregularly in order to appraise the useless areas as rooms to reach the number of rooms desired. Small dwellings in which more than the number of people that can accommodate had to live, came up with the idea of "not fitting into small dwellings".

WHAT IS SMALL HOUSE?

Mankind has needed a place where they can protect themselves, realize themselves and belong to it since the early ages. When we look at the entire historical process of human life, life-space analysis is directly related to the conditions of the period, the materials available, the technological developments that allow us to process and use the materials, and to what extent these developments have been utilized. The emergence of today's concept of "Housing" has

been realized in line with the "need". However, the concept emerging from this 'need' has now started to express different meanings due to many reasons such as changing climate and conditions, differentiation of production and livelihoods, migrations, increasing population, thus increasing the number of dwellings and changing living standards. It is possible to make a wide variety of definitions for the concept of housing, besides being a concrete fact, it is the definition of living space of human. In this respect, it is also an abstract and relative concept. The phenomenon of dwelling cannot be determined precisely, and of course, a single definition cannot be sufficient, but it would not be wrong to make a general interpretation as "a place suitable for providing conditions for surviving a living being". In his Sociology Dictionary published in 1969, Hilmi Ziya Ülken has defined the concept of housing as the general name of the shelter, where all types of families live from the widest to the narrowest.

In general terms, housing has become a complicated phenomenon defined by socio-demographic, psychological, political and economic factors, which is a physical unit that defines and limits space for households, acts as a shelter or shelter for actions. (Zeylan, 2009,s 8). The word "small" is; its dimensions are defined as being smaller than its counterparts, with a smaller width and less quantity. "Small residence is the unit where living spaces are created by developing some standards in terms of physical size such as space, volume or number of rooms". The concept of "Small House" mentioned within the scope of this study implies that the dimensions of the residential space are small in size. However, it is not proportional to the fact that individuals can make maximum use of residential spaces, depending on the number of individuals or the need to increase the floor areas of the houses. The important thing is the active areas of the dwelling. Being able to use the space efficiently and being able to meet different needs of different users is not related to the size of the house, but its functionality. While the large floor area will not be enough for the person unless it meets the needs of a person, a small but functional space will be much more suitable for the person. Small residential areas that can fully respond to the aforementioned situation and the needs of the person constitute the subject of the study. In this study, answers to the question of "What should be the 'Small Residence' spaces that have functional and flexible solutions and have sufficient equipment to fully meet user needs?" will be searched and sample interior constructions will be examined.

What needs initiated Small Houses and Why Are Small Houses Needed Today?

Although the formation process of small residential areas is as old as the residence history, the emergence of the concept of small housing, which is included in the scope of the research, is functional and fully serves the user, is not very old. The idea of "Living in Small Houses" started to develop in western countries especially during the Global Economic Crisis that emerged in 2008

"While the houses have been the way of accommodation since the first age, they are in a changing and developing relationship system with respect to the people. The industrial revolution that took place all over the world, while affecting all societies, accelerated urbanization. Increase in the rate of urbanization has started the spread of residential settlements, which is a rapid and practical solution for the accommodation of families being settled in the city." (Tutal, 2001).

After the industrial revolution, there have been serious increases in population densities in the cities with migration from rural areas to urban areas to meet the new labor force established in the cities. Due to the increase in urban population densities, the need for urban housing has also increased, and the lack of housing has turned into an important problem. In order to solve this problem and meet the need for housing, many new buildings have to be built, but it is not possible to build new houses in cities in a short time and with affordable prices to meet the housing need completely. Under these conditions, small volumes were built and workers who

came through migration started to live in these small houses. It would not be correct to say that small houses are preferred only for this reason. Some dynamic factors such as family structure, economic status, working population ratio, student potential of the society are also important reasons that increase the demand for small housing from time to time

Dickinson (1986), in his book on 'Small Houses', stated the reasons why these houses were preferred economically under the conditions required by the time; "There are two contradictory thoughts about small spaces in America in the 20th century. According to the first thought; There is no need for architects to organize small spaces, the other one is the need for professional architects to do the work. According to the first opinion; For these small houses, which are economically weak and suitable for those who do not have a home, four walls and roofs are considered sufficient. But the other view is derived from modern movements in the 20th century and has led to new architects. This view has been accepted by the public over time as the costs for small residences are less than large residences". Having the most densified life in the world, the Japanese have turned their limited and flexible interiors into a tradition. About 27% of the population residing in the big cities of England live alone. Due to the increase in prices in the real estate market, the demand for single life has increased very much and small spaces have become one of the main subjects of interior design over time.

In today's economy, building-construction companies produce projects mostly with the aim to earn more money. New investments in this sector are also oriented towards making more monetary income. The unfortunate fact that individuals want to own a house is for commercial reasons rather than the need for a place to live in. Individuals are now purchasing the property thinking how much money it will return to their income. When we look at the buildings that increase day by day in an uncontrolled manner on a commercial scale, the idea of producing housing types that will appeal to every user should also be adopted by the companies in the sector that they have started offering different types of housing alternatives with different housing sizes for a while. Small housing projects have to be involved among the alternatives in line with the need, on the way to commercial gain.

Depending on the increase and decrease in the number of family members through the time, individuals need small residences for a certain part of their lives. If we look at these with a few examples; single individuals who live in cities prefer singular life, because the place they prefer to live alone should not steal from the time they will use to work and socialize, it is important to be able to save material and time while establishing living spaces in the first stage, and then to keep the living spaces clean and organized between their daily activities. In this sense, choosing small space makes sense for individuals. For similar reasons, small houses also make living spaces more problematic for the elderly. Or the reasons for the temporary housing preferences for small houses are based on similar ideas.

Living spaces are getting smaller due to the increase in living costs. The number of those who prefer small living units is increasing day by day. Small houses have recently been in high demand by couples living in an expensive city and on a limited budget, by retired or elderly people who want to live in a small house rather than the old big family house, and by those who want to use it for office purposes (Gölgedar, 2011). Another reason for preference is completely economic that individuals, who do not have the financial power to buy a big house, buy small houses because they want to have their own house. Today, the first target of various public housing applications, led by private institutions and municipalities, is to try to close the quantitative housing gap by delivering many houses to its users in a short time. However, in this production form where the user, the designer and the manufacturer are completely uncommunicative, the satisfaction of the user is not always

achieved. In this case, there appear situations contrary to the traditional Turkish residence and lifestyle. On the one hand, since these housing types were built in a standard style regardless of the geographical and local characteristics of the city in which they are located, a loss of cultural identity started to occur in Turkish cities, and Turkish cities are becoming more similar to each other than ever before (DEMİRARSLAN, 2007).

Today, when calculating the size of house in newly designed social housings, family sizes or household averages are taken into consideration. However, this factors may not be enough. Because differentiating life style and life density play a very important role on the size of the house. In addition, the interests and hobbies of individuals, and therefore the storage areas required by them, seriously affect the demand for size. For a family of four, 80 m² of housing can be very large, for another family of four, 160m² can be less (Gür, 2000).

In the new housing concept created in today's economy, spaces are shrinking and space designs are lacking personality. These venues are organized to appeal to a general audience. While determining the requests of this user mass, generalization is made and venues are created to address basic needs. Therefore, the spaces created cannot meet the needs of all users. However, space users need to adopt the space in order to feel themselves well in the spaces and they do this by establishing personal relationships with the space. The more a person feels himself belonging to the space, the more s/he will be able to be self-realized so much in it.

The relationship between space and the sense of belonging has been a problem that designers have tried to solve for long. The birth of modular systems is the result of such search for solutions. Apart from the concept of "modularity", another concept that allows the customization of the spaces created by considering the general user mass is the concept of "Flexibility". In the architectural literature, "flexibility" is generally used in the sense of "the ability of a building to accommodate minimum and maximum variation", and flexible housing is defined as "residence that can adapt to the changing needs of users" (Environmental Design Congress, 2011)

In cases where the need for change occurs in the dwelling, flexibility (ability to change) can serve as a tool that can solve the incompatibility problem between the dwelling and the user and allow the functional life of the housing to be extended.

General Design Criteria in Small Houses

In this section, the data and the methods are to be taken into consideration when constructing a limited residential space. The important thing in small space design is that the materials used in the design are constructed/organized thoughtfully and in detail, and they are able to make the space used in the most effective way. In order to create a successful space, it is essential to analyze the activities that the space users will perform in the space and the necessary needs for them. As well as determining the needs, it will be very important to conduct detailed study on the layout plan. In this way, the well-designed small residence will respond to the physical and financial needs of the users, and will interfere with the impractical and inadequate existing living spaces, and offer them a "compact, convenient and comfortable" new living space. In Azby Brown "Small Spaces" book, in order for small spaces to be successful, He mentioned the necessity of meeting the "3C" rule. These are Compactness, Comfort and Convenience (Brown, 1993).

A space, designed in accordance with the basic principles, provides a creative, impressive, memorable and comfortable living to the user. Thinking big in small houses helps us to focus on the scale of that space and the dimensions of the reinforcement elements. Sensitivity to the

internal and external environment is an important detail of the building. At the same time, the proportions and dimensions of a room are very important in terms of aesthetics and ease of application (Gölgedar, 2011).

Flexible and multifunctional spaces are used in the past as they are used today. It is used even in the world traditions. Over the years, people around the world will prefer to live in smaller areas. This is not a hopelessness situation. On the contrary; they are smart solutions to limited spaces. Compact home life will be an advantage. Life in small dwellings will be more demanded and spread by more people. As long as the interior spaces can be useful, flexible and functional; contrarily, residence can give a sense of sufficiency, not smallness (Gölgedar, 2011).

When designers design small living spaces, they place the concepts of "functionality" and "transformability" in the focus of the design, so that one space can be used for multiple and different purposes. Multiple functions must be loaded on limited volumes. This plays an important role in the designer's ability to perceive space according to its proportions and to evaluate the space in the best way. The use of symmetry in planning affects the cost of the design and the sense of openness in the design. The design should be both useful and able to meet the needs (Smith, 1995).

Customizable spaces are needed in order to carry out the activities performed at certain times of the day. These are space elements that will serve the user when needed, such as a table layout needed at meal time, a desk at runtime, a storage area for storing the materials needed for the working environment when the work is finished. These kinds of space fittings are indispensable auxiliary units of small houses, usually resolved with the furniture system.



Figure 1. Transparent Divider Fig.



Figure 2. Semi-Transparent Divider

There is a need to make space partitioning for privacy within the space.

In such cases, separation elements are used in the space. Space partitioning tools are full separators, partial separators, permeable, semi-permeable or separator without physical barriers (with color, texture or material differences, lighting, etc.).



Figure.3.Partial Divider

While the space separation process is provided with full dividers, it may be necessary to be more careful, it may create a perception of space that is not desired to shrink an already small space. For this reason, small spaces are generally constructed as a single space or they may have to go through space analysis by overlapping multiple functions in the same area. Some of the daily activities such as living, eating, working, sleeping can be resolved by overlapping each other in the same place, and in some places all of these activities can be presented to the user in the same place.



Figure.4. Partial Space Partitioning with Level Difference

In places that allow partitioning by using dividers, divider units can be used vertically or horizontally. They can be evaluated as fixed or mobile (sliding, folding, rotating on a pit and swapping, etc.). It is possible to create different special spaces in the space with the moving uses of these dividing units. When the new spaces created are not used, the dividing elements can be eliminated and the house can be transformed into a single large space.



Figure.5. Example of a Full Divider Opened by Folding

The sample image shown in Fig.4 belongs to the apartment designed by Metamorphosis Studio for a young couple. Flat users informed the designers that they were looking for a flexible space and an accordion wall made of wooden panels was created to meet this request. In order to hide the privacy areas and to create an extra spacious space when necessary, a folding system that can be folded and re-closed is preferred.

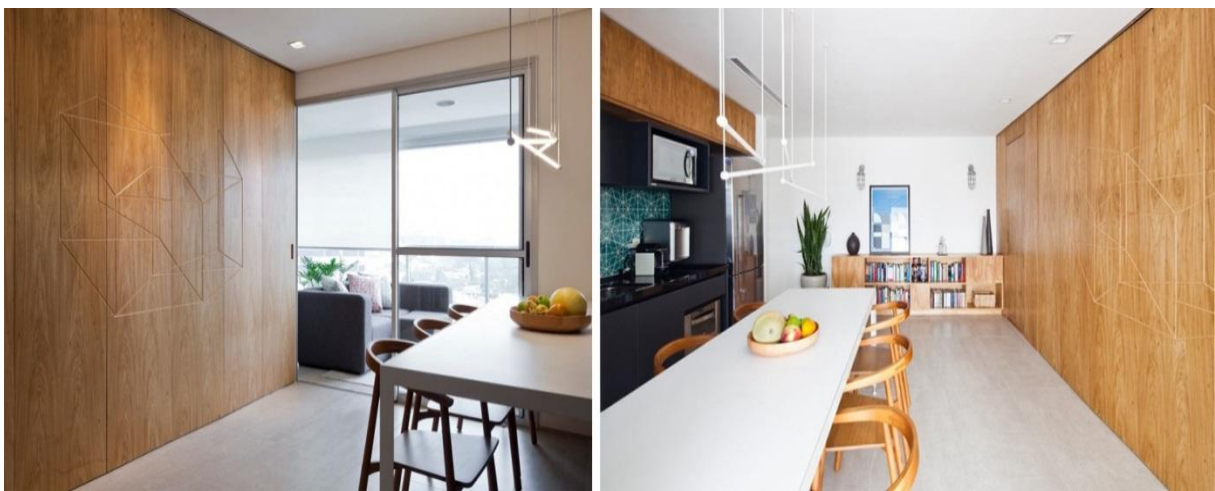


Figure 6. Example of Foldable Full Divider

In the entrance area, with the panels closed, there is a kitchen, dining room and a large balcony used to sit and relax, while the panels are folded, there is an open living room and a bedroom section behind the sitting area. In this example, we see that the dividers form a space by folding and opening and closing. Mobile space divider furniture systems designed by Yuko Shibata make it possible to create new space volumes that increase and decrease within the space by moving the divider accessory to rotate back and forth or at an angle.



7. Example of Full Splitter that Can Move Forward-Backward

In Fig. 6, vertical full divider setup has been created as a wall limiter, but the wall system allows for the flexibility of space by moving back and forth with the help of a rail system applied on the ceiling so that the space has enough space for the desired use.



Figure.8. Example of Full Divider That Can Rotate at a Specific Angle (90 degrees) Around an Axis

The sleeping space created in the same residence also contains the working space. Due to the focusing and privacy needs, these two activities were separated from one another in the living space and was presented to the user by overlapping them in the same space.

As previously stated, the use of full dividers in the space both vertically and horizontally will need to be given high attention as it will make the space smaller, the full dividers to be used horizontally should be preferred in the places where the ceiling height is high, otherwise the use of the spaces will not be healthy due to the height problem.

A very good planning is required at the design stage for an effective and correct use of dividing panels and fittings which act as space separators. As a result of correct and on-site planning, the necessary infrastructure must be set up correctly on floors, ceilings and walls in order to perform its movement thanks to special channels, rails or wheels. In addition, the fact that these mobile elements do not coincide with the windows in the residence, and at least one window that will receive natural light in the new space they create will increase the comfort of the user in the spaces.

Examples of Using Functional Furniture Suitable for User Change in Small Residential Spaces;

In our country, where the status of being a tenant and the rate of change of housing is high, it is known that space-furniture compatibility is an important problem, especially in the places considered as temporary housing. One of the most effective methods of resolving this mismatch will be the functional design of furniture. In order for the furniture to be functional, it must have a number of features such as opening-closing, collecting, storing, moving, modularity, changing size, and being used for different needs.



Figure 9. Example of Open-Close Furniture

The furniture unit known as 'Pill', which is the EMKO studio design in Figure 9, can open and close and respond to different actions. The unit, which is perceived as a cabinet unit when closed, serves the user both as a storage unit and a work desk.



Figure 10. Example of Foldable Furniture

The table in Figure 10 above, the table named "Tebur" designed by Nigerian designer Nifemi Marcus-Bello, offers a portable product with its feet that can be easily attached and dismantled. Screws fixed to the feet facilitate the assembly process with a simple mechanical movement.





Figure 11. Fixed Furniture Sample Figure



12. Mobile Furniture Sample

The cabinet combination, which is presented as an example in Figure 11 above, is a specially produced fixed reinforcement element that addresses different storage needs, appealing to different types of users. The example shown in Figure 12 is a mobile unit that is designed to be used as a table or to create a bench surface by moving it through its wheels when needed.



Figure 13. Example of modular furniture

In Figure 13, we see two different storage units formed by combining a different number of modules that are thought to meet the need for storage. Modular units can be used together in less or more numbers according to the needs of the user in the space and they can serve different user profiles and different shapes when changing users are considered. Furniture designers aim to enable the users to assemble the furniture according to the place by making production in modular units for the furniture whose user is unknown and not produced for a particular user. In this way, designers tried to ensure the harmony of space and furniture.



Figure 14. Example of Furniture Used for Different Functions

In Figure 14, the door surface can also be turned into a table tennis surface, and it can be shown as an example of a functional reinforcement element, designed for special uses, in which users can perform their hobbies in limited volumes.

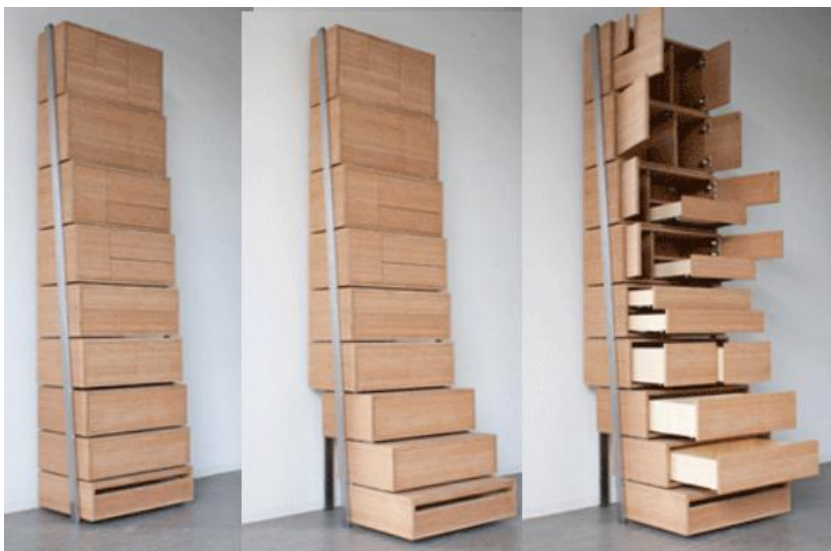


Figure 15. Furniture Example Used for Different Functions

The cabinet combination shown in Figure 15 serves as a storage with the shelf and drawer systems within its body, and it also provides access to the storage units on the upper parts by acting as a ladder by moving the drawer units back and forth on the rail. A cabinet unit designed in this way is an example that can be evaluated in order to increase the storage space in limited volumes with high ceiling height.

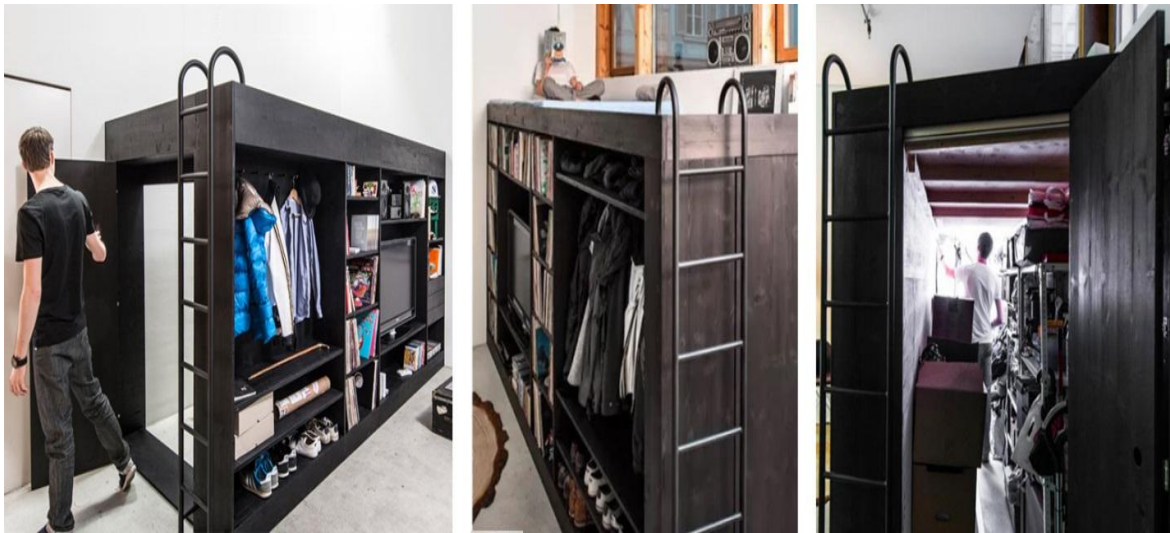
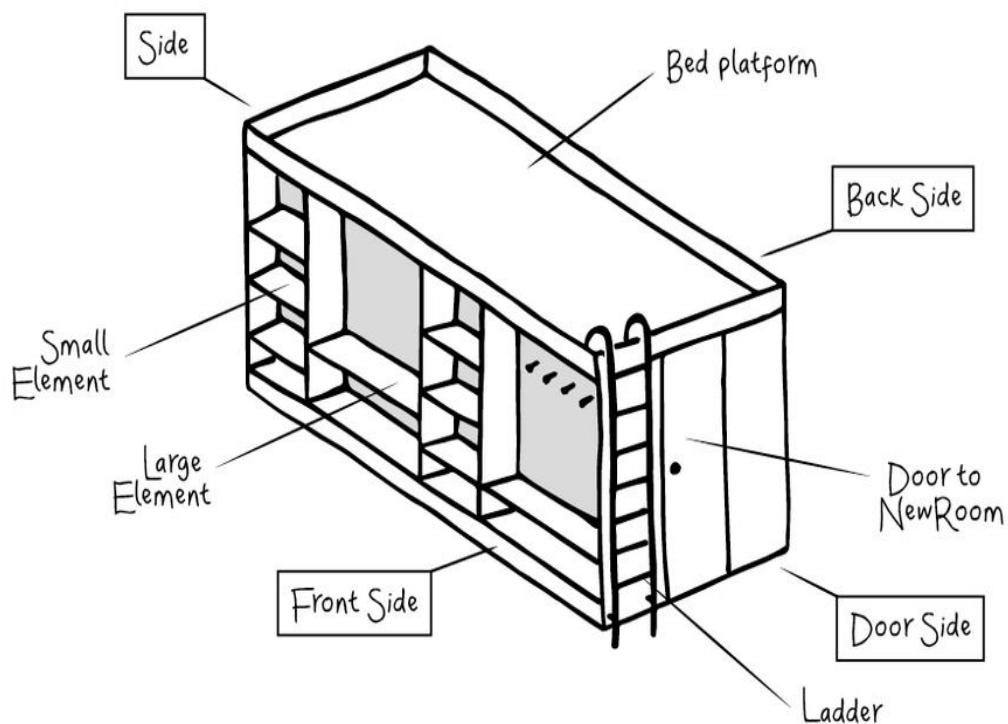


Figure 16. Furniture Complex Containing Different Functions- Life Box

The furniture complex, known by the name "Life Box", designed by German designer Till K  nneker, was designed to create a space-independent living space. There are three different usage alternatives: open-face, single-face wall-mounted and two-face-wall-mounted. Two surfaces of the furniture complex are wall-based in the above image.



There are storage areas with shelves and hangers on the unit. The upper surface, which can be reached by stairs, is planned as a lying area. The space, which is under the sleeping area and entered through the door, offers a wide storage opportunity to the user. The functions and dimensions of the cabinet complex also have the opportunity to be shaped according to the needs of the person. With this living box, the designer offers the user the opportunity to perform many different activities with a single furniture unit. Furniture, which are the complementary elements of the spaces and the spaces, have an absolute interaction with each

other. As furniture should be considered as an important input in residential interior design; In the furniture design process, residential interior features should be taken into consideration.

RESULT

In order to enable the user to make maximum use of the space in these residential spaces, a design scheme was created after the detailed “need analysis” by the designers and the spaces are generally divided into living spaces and privacy areas. Then, the space arrangement was made with the design of the fittings that can respond to the analyzed functions. The advantages of technological developments have been used in the space setup, and functional furniture systems have been created with modern production techniques and detailed solutions. In this way, the furniture used in the space is sometimes divided in a way that can be converted into more than one unit, sometimes they have different functions in different time periods of the day, they have been opened, closed, collected or removed, and provided the greatest support for the residential user to offer a fluid space experience. It is a deliberate attitude for the study to choose in the footage that is thought to be impossible to live in. In this way, it was aimed to emphasize the fact that individuals can successfully meet their needs even in extra small areas with specified quantities. The idea of living in small dwellings is primarily a way of life, perhaps it may not be a way of life that every individual can fit in, but this does not lead the conclusion that “small dwellings are not suitable dwellings for life”. It would be wrong to say that the size of the floor area of the living space increases the quality of life in the space, the fact that the space can meet the different needs of different users is largely related to the flexibility and functionality of the space.

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