

BASIC CONCEPTS OF FLEXIBILITY AND FLEXIBILITY IN ARCHITECTURE


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ABSTRACT. The ability to change or adapt to change in a short period of time with little cost and effort is one of the main definitions of flexibility. This concept, which appears in fields such as medicine, psychology, zoology, botany, sports, dance, educational sciences, and economy, is basically associated with the capacity to change and adapt to change. Flexibility in architecture is the level of meeting the desire of the users of the space to adapt the living space to itself in order to meet the current and future needs of the users. The fact that the desired changes cannot be made in the place due to the high cost of the transaction or the inconvenience of the planning creates negative effects in the financial context as well as in the quality of life. Within the framework of this defined problem, it is imperative that flexibility is questioned in the design process of architectural products. For this purpose, flexibility in working; The concepts of change, transformation, adaptability, mobility, modularity and inclusiveness are discussed and the place of these concepts in architecture is summarized.

Keywords: *Flexibility, Mobility, Modularity, Adaptability, Transformation, Inclusivity.*

INTRODUCTION

Flexibility is a phenomenon that concerns multiple knowledge areas. In its simplest form; Flexibility, which describes not being rigid and unchanging, should not be expected to have a single definition or an invariable, accepted explanation because of the meaning of the word. Flexibility, which defines the ability to make change in a shorter time and with very little cost and effort, expresses one of the main areas of interest of architecture in this respect.

The starting point of flexibility in architecture; Regardless of their income level, demographic structure or priorities, all users tend to personalize the space they belong to, and the expectations of the users from the residence change depending on their changing needs over time. The reorganization of the house comes to the fore due to reasons such as the desire of the user to customize the living space and the need for change over time, the physical/operational obsolescence of the house. The form, size, economic dimension of the reorganization; Since it creates a financial and moral burden for the low-income group, which constitutes a significant part of the world's housing users, it is a problem waiting to be solved. The concept of flexibility, which is one of the effective determinants of the housing's ability to respond to new expectations within the framework of sustainability with minimum resource use, comes to the fore in the search for solutions.

Various fields of knowledge and scientists working on these fields have tried to define flexibility by emphasizing its different properties and to adapt this phenomenon to their fields. Although the highlighted features of flexibility and the ways in which these features are used are very diverse, they still cover some common points.

FLEXIBILITY AND KEY CONCEPTS ABOUT FLEXIBILITY CONCEPT

Before discussing flexibility in a stable, bulky object producing field such as architecture, it would be helpful to address interpretations of flexibility in other fields of knowledge. Medicine, psychology, zoology, botany, sports, dance, educational sciences, economy are the main areas of use of flexibility. Definitions of flexibility are given below in order to identify some basic features from various fields of knowledge.

The ability to change or adapt to change in a short period of time with little cost and effort is one of the main definitions of flexibility. Flexibility in economics is the name given to the effect of the proportional change in one of the variables in a bivariate model on the proportional change on the other variable (URL-1). Both sides of the relationship have the capacity to change and adapt to change. The relationship between flexibility and production is explained as follows; “It is a production system that can be easily adapted to the changing product options and production techniques of manufactured products.” Diversity and speed are at the forefront in production (URL-2). In today's world where customer tastes and needs are constantly changing, the appearance and structure of the markets are determined by the consumers, and creating different products forms the basis of today's competition. The high diversity of parts that can be produced has brought the concept of flexibility in production to the agenda. Adapting to changes in environmental factors depends on the dynamics of the organizational structure and the flexibility of the production process. As the flexible structure in the business increases, the response to consumer demands and behaviours can be accelerated, and the target audience and market can be protected and enlarged. (Gönen and Çelik, 2004)

The relationship of flexibility with the process, the ability to adapt to changes with minimal loss in time, cost and performance is defined as operational flexibility. The relationship between the concepts that make up a flexible system requires a bidirectional structuring. (Topoyan, 2011). The relationship between flexibility and individualization is defined as “the potential to allow the desired change or to be personalized”. Flexibility during the acquisition of knowledge; It can be integrated into the concept of cognition, which refers to recalling and structuring previous information from memory. Thus, it is possible for an individual to use existing knowledge in different situations (Asıcı & İkiz, 2015).

Cañas (2005) defined the relationship of flexibility with the cognitive system as “cognitive flexibility is the ability to regulate one's information processing strategies against new and unexpected situations in the environment”. In general terms, the "cognitive" part of the concept of cognitive flexibility refers to the mental structures during the acquisition of information, and the "flexibility" part refers to the ability of individuals to use this information flexibly in alternative situations. Martin and Rubin (1995) see cognitive flexibility as the ability of individuals to adapt to changes. Dennis and Vander Wal (2010) define cognitive flexibility as the ability of a person to change their own cognitive patterns against environmental changes and adapt to new situations. In this context, cognitive flexibility requires awareness of alternative ways and options in order to adapt to situations. Individuals who are aware of possible alternatives (behaviours, solutions, etc.) related to a situation are cognitively more flexible than individuals who show only one correct behaviour (Martin, Anderson, & Thweatt, 1998; Payne, Bettman, and Johnson 1993) described three distinctive features of cognitive flexibility, which they defined as the adaptive capacity of the individual, as follows: Cognitive flexibility, as a skill that expresses learning processes, can be acquired

through experience. Cognitive flexibility involves adapting information processing strategies. It is the ability of an individual to adapt to new and unexpected environmental changes after performing a certain task. Considering the many problems and changes encountered in social life, the importance of cognitive flexibility for individuals emerges once again (Cañas, Fajardo, & Salmeron, 2006, Ereyi, 2016). Psychological flexibility can be defined as the ability of human intelligence to make connections between situations and produce new conditions. In short, psychological flexibility prepares a strong ground for the individual to participate in the existing world fluently and in the most appropriate way, instead of fantasizing the world that is desired to be permanent (Başoğlu, 2017).

The ability of flexibility to allow for differences was emphasized by Hertzberger. According to him, the basis of flexibility is based on the understanding that mechanisms to support different uses are included in a design (Hertzberger, 1991). Flexibility is defined by Bayazit as "the ability to return to its original state after being deformed under the influence of an external force". (Bayazit, 1979). In this definition, attention is drawn to the ability to maintain its existence and preserve its properties, not disappearing when exposed to influence.

Utkutug (2006), who associates flexibility with the concept of quality, defines the concept of quality as "the sum of the characteristics of a good and/or service based on its ability to meet specified or potential needs". Utkutug draws attention to the fact that flexibility is a quality indicator.

Based on the above definitions, it is possible to define flexibility as a situation where the existence of a border is controversial. Thanks to flexibility, although the limit does not disappear, its quality changes with permeability, variability, transformability according to conditions, adaptation and redefinition, and becomes open to new possibilities. This may be mutual between two groups affected by the relationship, or it may occur in the form of one adapting the other to him. According to Kronenburg (2011) the keywords that can be used for flexibility are "adaptation, mobility, transformation and interaction". Flexibility approaches associated with architecture are defined by Kızmaz (2015) as transformation, adaptation, mobility, modularity and change; By İslamoğlu (2018); can be added-removed, mobility, modularity, neutral areas, combining-division, multi-purpose use, different plan types, different plan types.

Within the scope of the study, the concepts of transformation, adaptability, modularity, mobility and inclusiveness and their relationship with architecture is briefly explained so:

Transformation: The concept of transformation is defined in the TDK dictionary as "to take another form, to take another state, to change shape". Although it generally describes a conscious and desirable phenomenon, transformation has created an unconscious or uncontrolled perception of situations such as migration, collapse of the status quo, rebellion, social events, wars and natural disasters throughout its historical process (Bergen, 2010; Örs Demir, 2008).

Adaptivity: The concept of adaptability, which is used synonymously with adaptability, is not an invention but a discovery in the historical process (URL-3). That is, existing in nature; It is the reflection of a reality that living things use to survive with components such as adaptation, change, transformation and flexibility (Özek and Minsolmaz Yeler, 2011).

The capacity of any genotype in nature to adapt to its environment, that is, its success in the field of adaptability, is determined by the changes that occur in that species.

Ekinci and Deniz (2016) argue that this concept is considered together with sustainability today.

Mobility: The word "mobile", which was transferred to our language from French, was first used in the 15th century. found in astronomy texts. The word originating from the Latin "mobilis"; movable means movable, able to change place (Delalex, 2006). Mobility is; mobility is mobility (URL-4). There may be time and limit for mobility. This concept can express physical mobility, as well as social horizontal and vertical movements (URL-5).

Modularity: The concept of module refers to units that complete each other and undertake different tasks and functions. Modularity, on the other hand, is a special type of design that deliberately creates a high degree of independence or "free assembly" between parts by standardizing the interface definitions of parts (Sanchez and Mahoney, 1996). In this context, standardization is one of the necessary conditions for modularity.

Inclusiveness: To include is defined as to take in, to contain. Inclusive, on the other hand, is defined as the opposite of vicious circle, which includes all features and subtleties (URL-6). Inclusiveness can be thought of as giving opportunity to differences, while being used in the meaning of accepting different possibilities, neutral, unbiased. Another term that supports the meaning of inclusiveness is defined as possibility, the state of being possible, and possibility as the appropriate condition or situation used; possibility. As can be understood from the above statements; the potential to have all the variations that can be real, seen as possible, can be characterized as inclusiveness.

FLEXIBILITY IN ARCHITECTURE

Regardless of their income level, demographic structure or priorities, all users tend to personalize the space they belong to, and besides, the expectations of the users from the residence also change depending on their changing needs over time. The reorganization of the house comes to the fore due to reasons such as the desire of the user to customize the living space and the need for change over time, the physical/operational obsolescence of the house. The form, size, economic dimension of the reorganization; Since it creates a financial and moral burden for the low-income group, which constitutes a significant part of the world's housing users, it is a problem waiting to be solved. The concept of flexibility, which is one of the effective determinants of the housing's ability to respond to new expectations within the framework of sustainability with minimum resource use, comes to the fore in the search for solutions. While revealing the relationship of flexibility, which is an important component in the design and sustainability of space, with architecture, it may be useful to define the concept of space and to examine the formation process of the flexibility-space relationship.

Schulz defines architectural space as a piece of space that meets the physiological, psychological and social needs of the users living in it (Schulz, 1963). Space, in Plato's words, is a nothingness that exists as an entity in the outer world, in which objects can hold. Even in the absence of these objects, space; a void will still exist as an unlimited container. (Lefebvre, 1992). While Schulz's definition of space is related to the tasks covered by the space, the space defined by Plato continues to exist and be inclusive regardless of the object in it. Based on Schulz's definition, it can be said that the flexibility of the space will be demanded with the change of the tasks of the space. All the components of the space, created to meet the physiological, psychological and social functions that the user needs, create some effects in their relations with the other spaces they exhibit among themselves or in a neighbourhood relationship. In accordance with

the purpose of installation of the space; effects such as being central, limiting, inclusive, close, inviting, isolating, determining, prohibiting, continuous, separating, directing, and unifying (Kırcı, 2013). The above-mentioned features are psychological effects and can arouse different feelings in individuals. Since space is personal and includes psychological experiences. The origin of psychological space is based on perception (Zorlu, 2013). Since the subject of space is closely related to perception and psychology, it is not possible for all users of a produced space to feel the same and be equally satisfied. Due to the very natural personal differences, it is important that the space be flexible enough to adapt to the characteristics and desires of the user. It may be desired to meet the current needs depending on the time and the user, to change the existing features of the space, to adapt it to various possibilities, and to transform it.

According to Lefebvre, space is a social product (Lefebvre, 1992). The concept of creating space; should be evaluated with the fact that the space created is a social product. If space is a product, its reality is the self-expression options it allows the user. (Pellegrino, 1995; Suvanajata, 2001). If the reality of the space depends on allowing the user to express himself, this reality is expected to change. In this case, the reality of the space depends on its capacity and flexibility to adapt to the variability of the user. The expectations of the users from the space are that they can get the opportunity to perform the mental activities they need - exploring - and social activities. If space is a social product, flexibility will affect the social relationship that people establish with themselves and with others, and will enable them to evolve into the desired shape.

If space is a power of representation, it is the whole of what the space expresses and human behaviours that can be expressed in the space. Therefore, in the reproduction of the space, basically the reconstructing of social relations predominates. This transformation can only occur as a result of the spatial unit interacting with all the forms and structures surrounding it (Pellegrino, 1995; Suvanajata, 2001).

In summary, the diversification and change of human behaviour and use in space and the re-establishment of social relations require transformation in space. However, while architecture produces the built environment, it defines the volume. To be able to provide the desired flexibility, the space part in Plato's definition is related to the physical properties of the space, which is the boundary of the space. Physical space; It is possible to classify in three basic ways as indoor, outdoor and semi-open space. All physical spaces are spaces with boundaries and include measurable distances. The fact that these distances, boundaries, and features of the space, together with its components, can change, transform and adapt for a new plan are indicators of the flexibility of the space. It is important that the space constraints, namely the surface, form and structure, are suitable to provide this. Broadbent (1973) states that the built environment, on the one hand, limits human actions, and on the other hand, provides opportunities for transcending these limits. He interprets the concepts of "possible environment" and "effective environment" defined by social scientists as:

A created physical space is a possible environment and an environment in which many possibilities are reconciled. The effective environment is formed as a result of the interaction between the user and his physical environment. It is in question that people perceive this environment and create all their cultural values.

Lang's concepts of "flexible environment" and "adaptive environment" take shape in a similar way. Flexible environment means the environment that allows change by

playing the elements of the environment in that environment. Adapting environment is an environment that provides various possibilities due to the elements it contains and allows different actions in it.

In Gibson's (1986) "Theory of Possibilities", he drew attention to the potentials of space. Although creating a space is the first step for human beings to develop the relationship defined by spatial behaviors, as well as performing their behaviors and actions in the space, it is the possibilities offered by the space that are important for all this interaction process. According to Gibson, convenience is the features of any object that enable it to be used for a specific purpose/action in terms of its form and setup (Kahraman, 2014).

Rapoport some environmental concepts in human-environment relations; environmental determinism is summarized as possibilism and probabilism. In environmental determinism, it is argued that the physical environment determines human behavior. Likelihood is the view that people make choices based on some other criteria, mainly cultural, and that the physical environment they live in provides opportunities and necessities. Probabilism is a concept that describes a situation where the physical environment provides and does not limit possibilities for choices, but where some choices are more likely than others in a given physical location. As a result, it can be said that the physical environment provides opportunities for human activities, and that people interact with this environment in a complex way and form their effective environment (Ertürk, 1984).

While flexibility was part of the modern architectural culture of the 1920s and 1930s, pre-war strategies of flexibility are placed in a different position by architectural historians and critics than after 1945. Early flexibility strategies; It is based on equipping a space with mechanisms that will enable it to transform into a limited number of spatial variations in order to serve a few specified functions. From this point of view, the link between each spatial variation and function exactly coincides with the phenomenon of functionalism, which Hertzberger defines as "the specialization and separation of spaces according to functions". The notion of flexibility, which is one of the features desired to belong to the space rather than an architectural trend, is "a kind of functionalism" according to Collins in this period (Hertzberger, 1991; Forty, 2000).

Indeed, functionalism should not be judged solely on the functional efficiency of form and function. Instead, both functional flexibility and functional stability can be positioned as sub-expansions of functionalism, when it is read as a sensitivity aiming efficiency by centering the function in architecture. In the functionalist period, where the discussion of flexibility has just found a place in the discipline of architecture, there is the creation of a space or a new use that was not foreseen by the architect. In this context, functional flexibility as well as functional stability can be compared to a closed-circuit broadcast broadcasting more than one channel (Forty, 2000).

According to Forty, especially after the 1950s, flexibility strategies, by also putting forward time and uncertainty; It aims to purge functionalism of deterministic excesses". Forty states for the first time that since the 1950s, flexibility has come to the fore as an architectural principle. According to him, the understanding of flexibility, which removed the oppressive determinist rules from the agenda after the war, popularizes the opinion that the notions of function and use are resolved with a new kind of flexible space based on three ambiguities (Forty, 2000).

The determination of the functional performance of the space with non-evaluable criteria also legitimizes solutions that cannot be reconciled with reality. In this context,

Van Eyck has brought very fundamental criticisms to the post-war flexibility strategies since the 1960s and compared the flexible space to a glove that can enter any hand, but is not actually designed for anyone's hand. On the other hand, the notion of flexibility still exists when it is instrumentalized in architectural design, ignoring the fictional contradictions it contains (Van Eyck, 1993).

CONCLUSION

Flexibility is related to many fields apart from architecture and with its own unique methods in every field; It is a situation that describes being changeable, transformable, adaptable for various possibilities and having the scope and quality to meet them. The importance of flexibility in terms of architecture, in its most basic form, emerges due to the user's tendency to personalize the space.

Regardless of their income level, demographic structure or priorities, all users tend to personalize the space they belong to, and besides, the expectations of the users from the residence also change depending on their changing needs over time. The reorganization of the dwelling comes to the fore due to reasons such as the desire of the user to customize the living space and the need for change over time, the physical/operational obsolescence of the dwelling. The concept of flexibility is considered as an important element in terms of meeting the user's needs and personalization needs in a sustainable manner and with minimum resource use.

The relationship of flexibility with architecture; transformation, adaptability, mobility, modularity and inclusiveness, which are identified as the basic components of flexibility. Then, the concept of space was defined and the formation process of the flexibility-space relationship was examined. It is aimed that the literature study can create a basic perspective for flexibility strategies and flexible design criteria for space design.

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