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BRIDGING THE GAP: DESIGNER'S "USER CONCEPT" AS A TRANSFORMATIVE TOOL BETWEEN USER KNOWLEDGE AND DESIGN

Meltem ÖZTEN ANAY [1]

ABSTRACT

Currently, growing public demand for an inclusive architectural environment points to a challenging task: effective integration of user knowledge to design. Addressing this issue, the purpose of the present study is to review the problem between user knowledge and design and to propose and examine designer's "user concept" as a potential answer towards bridging the gap between user knowledge and design. For this aim, "the definition of user knowledge," itself, and the nature of the prevalent design model are viewed and addressed as the two main sources of the problem. Designer's "user concept" is proposed as a transformative tool and its significant role both in identifying the need for user knowledge in design process, and in the integration of this knowledge to design is clarified.

Keywords: Knowledge and design, User knowledge, Design model, User concept.

KULLANICI BİLGİSİ İLE TASARIM ARASINDA BİR DÖNÜŞTÜRÜCÜ ARAÇ OLARAK TASARIMCININ "KULLANICI KAVRAMI"

ÖZ

Günümüzde, daha kapsayıcı mimari çevreye olan talep zorlayıcı bir görevi işaret etmektedir: kullanıcı bilgisinin etkin bir biçimde tasarıma entegre edilmesi. Bu çalışmanın amacı, bu görevi ele alarak, tasarım ile kullanıcı bilgisi arasındaki sorunu gözden geçirmek ve tasarımcının "kullanıcı kavramını" bu soruna, yani kullanıcı bilgisi ile tasarım arasındaki boşluğun kapatılmasına, yanıt olarak önerip incelemektir. Bu amaca yönelik olarak, "kullanıcı bilgisinin tanımı" ve tasarım modelinin "kabul edilmiş" tanımı problemin iki ana kaynağı olarak görülüp ele alınmıştır. Tasarımcının "kullanıcı kavramı" bir dönüştürücü araç olarak önerilmiş, tasarım sürecinde kullanıcı bilgisine olan ihtiyacın belirlenmesinde ve bu bilginin tasarıma entegre edilmesindeki önemi açığa kavuşturulmuştur.

Anahtar Kelimeler: Bilgi ve tasarım, Kullanıcı bilgisi, Tasarım modeli, Kullanıcı kavramı.

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1. INTRODUCTION[*]

The plain definition of user, in general sense, refers to "one who has or makes use of a thing; one who uses or employs anything," and related term "use" is defined as "to put into action or service; avail oneself of and to inhabit, reside, or dwell in or at a place" (Oxford English Dictionary 1983). Within design context, user is conceived as the one, whose needs are aimed to be satisfied by design solutions. Since 1960s, a great effort has been given to understand "user." User needs, preferences, and expectations have become main issues. Various methods, from analytical to observational and participatory, have been developed in order to provide effective representation of user in design.

Despite the accumulation of valuable body of knowledge about user, today, there is a growing criticism about designed environments, in terms of their quality and increasing demand for more user inclusive environments. This requires existing attitudes in architectural design to be reviewed and draws, once again, the issue of user to the fore (Worthington 2000; ACE Report 2004).

Considering recent problems and discussions, it is observed that one of the crucial emphases is still on the translation of user knowledge to design solutions effectively. It is mainly related to the problem between "user knowledge" and "design," which has been widely discussed since 1960s.

The present study aims to address this ongoing debate in design field by clarifying the role of designer's *user concept* in the relation between "user knowledge" and "design." It starts by a brief overview about the problem of user knowledge in design. Then, designer's *user concept* is underlined as a transformative position between user knowledge and design. To elucidate this role, the study focuses on designer's problem structuring and the role of preconceptions of designer in this process. On this background, *user concept* of designer and its role in the utilization of user related knowledge are clarified.

2. THE PROBLEM OF USER KNOWLEDGE IN ARCHITECTURAL DESIGN: A BRIEF OVERVIEW

2.1 The Problem of User Knowledge and Design

The integration problem between user knowledge and design is not a new problem. It has been discussed as part of a more general problem between "knowledge and design"[**] since 1960's. Actually, the problem is generally conceived in terms of translation of knowledge from different domains to design process. One of the core problems is application of behavioral research knowledge to design (Windley and Weisman 1977; Pastalan 1977; Schön 1988). The main constituents of this "applicability gap" between user knowledge and design are investigated since then.

Despite accumulation of great amount of user knowledge since 1960s, developments both in methods of eliciting user knowledge and in understanding design activity, similar problems are still discussed as to deficiency in the quality of designed environments (Mitchell 1993; Melican 2000; Zeisel 1984). There are two interrelated problem areas, which influence integration of user knowledge with design; the problem in the definition of user knowledge (for design) and the problem in the nature of design process. Following part focuses on these underlined problem fields.

2.2 Problem in The Definition of User Knowledge

This problem field is mainly related to the relevancy of user knowledge defined by researchers for design use. This assessment is based on the difference between the nature of scientific knowledge that is produced through research and the nature of design knowledge that is generated and used in design process. While, most of the research based user knowledge is descriptive, design is defined as prescriptive. Pastalan (1977) indicates that "divergent frames of reference," which guides understanding about design and user knowledge is the problem. He

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[**] Windley and Weisman (1977) state that this application problem of knowledge to design has their roots in the discussions on "relating knowledge to action" in social sciences at the end of 1940s.

explains this as stating, "[b]asic differences in the value systems and 'ways of knowing' characteristic of researchers and practitioners were in conflict… [researchers] trained for analysis, not synthesis. In dealing with a problem the scientist must dimensionalize phenomena and ascertain the contribution of individual variables and clusters of the variables to behavioral outcomes. The researcher is primarily interested in understanding behavior and is only secondarily interested in putting together knowledge having direct and specific application. On the other hand, the practicing architect must be synthesizer of knowledge, points of view and practical demands" (1977).

Mikellides (1980) exemplifies this difference from the perspective of research in architectural psychology. He states that psychologists interested generally in "second order" problems, which are related to underlying principles and seeking answers for the question "why." On the other hand, architecture mostly deals with "first order" problems, which involve specific questions. Because of this, user knowledge gathered from second order perspective cannot applicable to design situations easily.

Underlined problems seem mainly come from prevailing positivist understanding of knowledge, whose main goals are searching for universal principles and measurable features of the phenomena. Even in the design field, during 70's, Hillier et al. (1972) indicate the influence of this understanding, which requires that "research should bring as many factors as possible within the domain of the quantifiable, and progressively replace intuition and rules of thumb with knowledge of methods and measurement." Therefore, the role of research is defined as providing "factual information that can be assimilated into design" (1972).

The strong effects of this research approach and user knowledge produced through its methods are prevalent today in design field and underlined in relation to ongoing problem of applicability of user research to design. In his research on utilization of user research in creative design process, Melican (2000) grounds his study on this reappeared problem and states, "[a]s a new generation of designers has taken to the methods of user research, the applicability gap has reappeared… Due to their concern with the analysis and description of the current situation and current practice, ethnographic methods may be of limited value in confronting the transformational implications of introducing new

technologies. Established ethnographic methods have traditionally been used as means of analysis and description, not as means of inventing the future." The current situation also indicates limitations in the definition of user knowledge through its positivist conception and its methods, in terms of their relevancy for design use.

2.3 Problem in The Nature of Prevalent Design Model

As stated previously, the roots of the integration problems of user knowledge go back to the *design methods* discussions of 1960s. In this period, design process is conceived as the object of systematic approaches (Figure 1). The basic aims of these methods were described as "working out the rational criteria of decision making" and as "optimization of decisions" (Bayazit 2004).

It is noted that integration problem is mostly related to the design model that is based analysis-synthesis model of science, which assumes that theories -synthesis part- derives logically from analysis of facts (Hillier et al. 1972; Schön 1983). Applying this notion of science to design process leads both understanding of design problem as "well-defined" like natural science problems, which are definable, separable, and have findable solutions (Rittel and Weber 1974) and division of design problem into its parts in a separate manner, as data gathering, analyzing, and synthesizing design solutions (Jones 1970; Hillier et al. 1972; Ledewitz 1985).
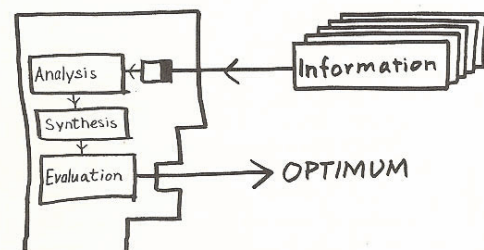

Figure 1. J. Christopher Jones' figure for systematic, rational model of design (Jones 1970)

Analysis phase contains the collection and classification of all relevant information relating to the design problem. Synthesis phase covers the formulation of potential solutions. Evaluation phase provides the attempt to judge the one most satisfactory solution (Luckman 1969). Ob-

jective and measurable behavioral knowledge of user take place in data gathering, "analysis," phase of the systematic design process, and it is assumed that collected data is incorporated into "synthesis," or problem solving phase in this approach.

The main problem seems to come from the divided process as analysis and synthesis. This process of design puts knowledge generation and design into discrete phases, accordingly, leads discontinuity between analysis and synthesis phases (Hillier et al. 1972; Ledewitz 1985). In this process, it is clear that translation of user knowledge to design solutions is difficult, due to the division between phases.

Therefore, this sequential, linear understanding of design contradicted specific, intrinsic characteristics of the design activity itself (Hillier et al. 1972). Ledewitz (1985) states, "[p]roblem-solving, as we understand it today, is not aggregation of objectively-derived facts, but a dialectic between pre-conceived solutions and observed facts."

Another difficulty is about the relevancy of knowledge provided in analysis activity for design use. The analysis phase is mostly dedicated to analysis of problem elements and involves mostly descriptive knowledge about them, which conceives user knowledge as empirical, objective, and generalized. On the other hand, designer's task is closely related to the specificities of the situation, contextual knowledge, and intentions and meanings. Despite the fact that this type of knowledge provides necessary information about components of the problem, it has limits to provide prescriptive, contextual, and up to date qualities and therefore, it is weak to support solution generation. The assumption is that this understanding of design excluded specific, contextual, non-quantifiable dimensions of user, like spatial experience of user, from design process and restricted reflection of knowledge to design solutions.

Considering provided design model, it is clear that user knowledge could not be actively used in analysis-synthesis model of design. It remains passive and could not affect solution generation sufficiently, which is essential for effective transformation of knowledge to design. With this kind of knowledge-design relation, user knowledge would not be part of active knowing and would not be transformed to design effectively.

Although, discussions on the nature of actual design activity start around 1970s, studies on systematization of design process become widespread, and it is still common in design practice and education today. In recent discussions, parallel to the criticisms of 1970s, negative effects of linear, sequential and separated understanding of design are underlined.

It is clear that generation and integration of user knowledge in design is still a significant problem and needs to be resolved. There are promising attempts to develop approaches to define characteristics of user knowledge for design use (Melican 2000) and to scrutinize the nature of actual design activity (Cross 2006; Restrepo and Christiaans 2003). At this point, present study aims to focus another significant component of the problem between user knowledge and design: the designer and the role of his/her *user concept* in defining knowledge need and use in design. Following part examines the role of designer's understanding about user, in terms of knowledge integration to design.

3. THE ROLE OF DESIGNER'S *USER CONCEPT* BETWEEN USER KNOWLEDGE AND DESIGN

With regard to the integration problem between user knowledge and design, which is one of the main reasons of the insufficiencies in representation of user in design, the influential role of designer has been strongly emphasized since 1970s, particularly by the descriptive approaches. This emphasis on designers' significant role in utilization of knowledge in design is getting stronger with the contribution of research on actual design activity of designer. This indicates that designer's capacity to understand user is essential to recognize and utilize user knowledge in design effectively.

To elucidate the role of designer's understanding about user in design, this section will focus on the nature of actual design activity, the role of designer between knowledge and design, and *user concept* of designer in this relation.

3.1 The Nature Of Actual Design Activity And Problem Structuring

In the field of design, with the developments in philosophy of science, such as Karl Popper's and Thomas Kuhn's works, and descriptive studies that focused on designer's actual design activity, the nature of design activity is clarified, particular character of design prob-

lem is defined, and the role of designer in this process, in terms of knowledge use, is underlined. For Popper, it is in the interplay between the tentative theories (conjectures) and error elimination (refutation) that scientific knowledge advances toward greater and greater problems (Figure 2).

$$PS_1 \rightarrow TT_1 \rightarrow EE_1 \rightarrow PS_2.$$

Figure 2. J. Popper's formula about the advance of scientific knowledge that was influential for the development of conjecture-analysis model of design. In this process; in response to a given problem situation (PS_1), a number of competing conjectures, or tentative theories (*TT*), are systematically subjected to the most rigorous attempts at falsification possible (Popper 1972).

Cross (2006) states that "these studies tend to support the view that there is a distinct 'designerly' form of activity that separates it from typical scientific and scholarly activities." He underlines that while science is analytic, design is constructive. This intrinsic nature of design is defined as "designerly way of knowing" and the main aspects are described as follows (2006); "designers tackle 'ill-defined' problems; their mode of problem-solving is 'solution-focused'; their mode of thinking is 'constructive'; they use 'codes' that translate abstract requirements into concrete objects; they use these codes to both 'read' and 'write' in 'object languages'."

The process of problem structuring can be underlined as the key feature of design activity (Hillier et al. 1972; Schön 1983; Restrepo and Christiaans 2003). Therefore, as Cross (2001) underlines, designing involves "finding appropriate problems" and solving them and "includes substantial activity in problem structuring and formulating, rather than merely accepting the 'problem as given'." The early formulation for problem structuring in design is made by Hillier, Musgrove and O'Sullivan (1972), with the notion of "pre-structuring." In their "conjecture-test" model of design, they suggest that design problems are only understandable in relation to the design solutions and this process is achieved through defining boundaries of design problem suggesting tentative solution with the guidance of designer's pre-existing cognitive capability (Figure 3).
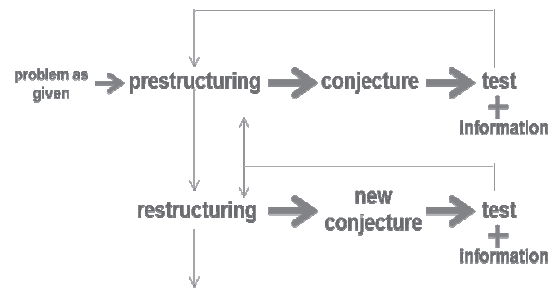

Figure 3. The process of conjecture-test model of design, which is based on Popper's conjecture-analysis model for the advancement of scientific knowledge (drawn by the author).

3.2 Pre-conceptions of Designer in Problem Structuring

It is underlined that structuring of design problem begins with designer's interpretation. These early interpretations of designer have a great influence on how the process continues. Rittel and Webber (1974) state that designer's "choice of explanation determines the nature of the problem's resolution," in other words, "the analyst's "world view" is the strongest determining factor in explaining a discrepancy and, therefore, in resolving a wicked problem. On the influence of designer's world view, Harfield (2007) notes that "knowingly or unknowingly, each designer thus brings to bear on the problem as given a viewpoint or a position, a set of formal and aesthetic and technical sensibilities, based on prior experiences and preferences and prejudices, which determine not only how the problem at hand will be solved, as if it is somehow neutrally presented for the most efficacious solution, but just what problem the designer will choose to solve."

Hillier et al. (1972) explain designer's role with reference to their notion of "internal constraints," which are defined by designer's prior knowledge, and they underline the importance of pre-existing cognitive map of designer on the guidance of problem structuring. They point out that "[it] is largely through the existence of such maps that any cognitive problem solving activity can take place. They are, and must be, used for the problem solver in order to structure the problem in terms in which he can solve it. It acts as a plan for finding a route through problem material that would otherwise appear undifferentiated and amorphous. Its role is equivalent to the role of theory and theoretical frameworks in science" (1972).

The chief elements that constitute designer's pre-existing cognitive field, which triggers his/her pre-structuring, are categorized as knowledge of instrumental sets, knowledge of solution types, and informal codes. Instrumental set represents the knowledge of technological means. Solution types provide the knowledge of past solutions of similar problems. Informal codes, on the other hand, linking abstract functional requirements and instrumental sets, constitute a theory-like role and provide route for pre-structuring of designer (Hillier et al. 1972).

Therefore, above explanations indicate that problem structuring, as a core pattern of designerly way of knowing, is vital to connect knowledge and design with the guidance of designer's cognitive capabilities. Following part clarifies the role of *user concept* in problem structuring as part of prior knowledge of designer.

3.3 *User Concept* of Designer

Concepts can be treated as cognitive tools for coping with the world and solving problems. Plainly, "concept" can be defined as something conceived in the mind, thought, idea, notion, or a general and abstract idea (Merriam Webster's Unabridged Dictionary 2000). In his book *Displacement of Concepts*, Donald Schön (1968) points out that "there are no observations, data, perceptions, objects, independent of concepts. We cannot even name things without giving clues to the concepts which make 'things' of the situations confronting us."

User concept of the designer can be conceived as a knowledge structure, which is formed by the accumulation of personal experiences, experiences and knowledge about user provided by design education and practice. It determines designer's stance about user in approaching any design problem. Peter Stringer's (1980) notion about the models of man may help to clarify the role of the *user concept* in architectural design. He states that designers' set of assumptions about user constitutes their models of human being, "… which may lead to quite different views of architecture for people… They are often implicit in professional matters. They regulate the kind of architectural or psychological theories we might develop, and as a result determine our practical strategies for designing buildings or studying and developing people's behavior and experience" (1980).

Grounding on this base, it is clear that *user concept* of designer, as a knowledge structure, is

an important component of designer's prior knowledge and is formed by accumulation of knowledge, experiences, and values, which are gained through designer's everyday experiences, learning experiences, and experiences in practice in time. These experiences, knowledge, values, and relations in turn form a mental image about user in designer's mind. With this knowledge base, it can be stated that *user concept* has two potentials in problem structuring in any design situation (Özten Anay 2010);

- provides designer a stance, a framework as a theory-like structure to define the situation and to predict the future needs,
- provides designer a knowledge repertoire to be used as a base in problem structuring and to support concept generation and evaluation of the solutions.

On this basis, taking account of the idea that design inevitably depends on designer's perspective, interpretation, actually, structuring of the design problem, to be solved, it seems possible to state that *user concept* of designer, as part of his/her prior knowledge, has potential to guide need for knowledge and generation and integration of it in problem structuring, in terms of user (Figure 4) (Özten Anay 2010).

Figure 4. The *user concept* of designer between user knowledge and design solutions (drawn by the author)

In this process, *user concept* provides designer a framework to conceive user, to determine need for knowledge and to filter required knowledge and a base to contribute building user model for design problem at hand and to support concept generation providing concept knowledge (Özten Anay 2010).

4. CONCLUSION

In the introductory essay of his edited book, *Architecture for People*, Byron Mikellides (1980) provides a brief overview on human needs, research in social sciences and architectural design, and gives a mindful framing about conceiving user needs by architects in design activity. He argues that "[k]nowing about human needs is an important first step, understanding these needs is a vital second, but evoking and

expressing them through their translation in built form is a culminant third." All these constitute the main discussion fields of the problem between "knowledge" and "design" and at the same time, they are necessary components to achieve inclusiveness in design.

In this relation, between "knowledge" and "design," designer's *user concept* has a significant capacity to contribute his/her knowing, understanding, and communicating user needs, constituting a user related framework in the "problem structuring" process. With this role, it has the ability to support generation of design solutions in terms of user needs and expectations, and creates a need for user related knowledge.

Designer's guiding role can be underlined as significant as the role of nature of design and the role of qualities of knowledge provided during design activity. It can be stated that the effectiveness of *user concept* in problem structuring depends on its capacity to cover qualities of user sufficiently and on its capacity to support translation of these qualities to design solutions.

Clarifying the nature and the limitations of designer's *user concept* is worth to be investigated for the achievement of effective integration between user knowledge and design. Since, design education, particularly the design studio, where the basis of necessary skills, attitudes, and knowledge for design activity are developed, has an important role in the formation of *user concept*, it is essential to investigate dimensions of the formation of *user concept* in the architectural design studio.

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