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THE RULE OF PUBLIC PARTICIPATION IN SUSTAINABLE DESIGN PROCESS

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ABSTRACT

In this article, we looked at a certain gap in the design process, namely, the question of how to participate users in the design process, analysis, synthesis and evaluation should be done. We have shown that Quality Function Deployment tool exists that deals with this question. Our paper attempts to challenge the process because of the importance of this question for the successful implementation of the design process and as a result, the design and planning for sustainability. The research question: Citizen Participation in what stage of the design process should be done? Qualitative Research Method is adopted in this paper which being supported by depth interview technique with questionnaire. The success of design clearly depends on the relationship between the design and the participation in three stages of design process. Many landscapes designed for further use to customers where as this research suggests that the introduction of participation into design can lead to a universal process without a loss of creativity or synthesis.

Keywords: Participation, Design process, Sustainability.

Contribution/ Originality

This paper is to propose a systematic guideline to find participant requirements on the relationship between the design and the participation in three stages of design process. In order to developing a sustainable landscape design, This model developed to meet sustainability in architecture and planning, which is examined in case of Iran, Tehran.

1. INTRODUCTION

Sustainable design has a lot to do with society, economy and environment's principles, and these elements should be considered in design process. Social aspects of sustainability, is in need of

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community participation. Participation in the design process especially in landscape architecture and design is one of the most important factors which are emphasized in recent years and new theories .Based on this; we can answer the question of how to achieve sustainability in the use of participatory design. Participatory design is considered activity based on the distribution of power among designers and people and interest groups (Mahdavinejada and Abedi, 2011). Every designer has a different way of working. This research started from personal questions about designing with people and the process was also a personal experience as well as a self-experiment in the field of Design Participation to understand the practice of other participation practitioners (Lee, 2006). Effect of traditional thinking and functional design flexibility to respond to new needs and sometimes exclusive emphasis on synthetic, leading to neglect or pay enough attention to the notion of historical, social and economic environment reflections of the physical form ignore of native knowledge and traditions are like them. In the past these processes follow organic process that the result of human interaction with the environment. In recent years this process are transformation and forced follows of the pattern. Low attention patterns due to natural conditions, sometimes in conflict with the social and economic characteristics. This subject often leads to the formation of process of the unstable cycle. In contrast to this process, a wide range of ideas aimed at sustainable development and reduce the effects of this instability has been adjusted.

Issues, encourage architects, interior designers and landscape architects to identify participation as an essential component for design processes (Armestrong, 1993) (Shibley and Schneekloth, 1995) (Ife, 2002) (Milburn and Brown, 2003) (Lawson, 2005) (Lee, 2006) (Project for Public Spaces, n.d.) (Mahdavinejada and Abedi, 2011) (Lombard, 2014). According to the principles of the design of such a dialectical approach based onreciprocal link of environmental and social and holistic approach cannot purely designtreat physical activity. But in addition to being physical, environmental issues, which in itself is a reflection of the social - economic. This activity since can follows the relatively stable conditions that reflect the characteristics of the environment, socio - economic and aesthetic. It since manifest of which is the interaction with people and native knowledge. Public participation in this process can provide a good substrate for the subjective and objective. This paper is to propose a systematic guideline to find participant requirements on the relationship between the design and the participation in three stages of design process. In order to developing a sustainable landscape design, This model developed to meet sustainability in architecture and planning, which is examined in case of Iran, Tehran.

2. RESEARCH QUESTION AND RESEARCH METHOD

2.1. Research Tools

Quality Function Deployment has been defined as a method for developing a design aimed at satisfying the customer and then translating the customer's demands into design targets and major quality assurance points to be used throughout the production phase (Akao, 1992). It is a highly effective and structured planning tool to deal with customer demands more systematically. In a refurbishment project, contractors' services may not always satisfy the residents' needs, expectations and quality standards, because refurbishment involves complicated and intensive work that is difficult to integrate. Problems in terms of refurbishment styles, delays due to incomplete

designs, misunderstanding of client expectations, rework, etc. are often observed (Dikmen *et al.*, 2005). QFD is a pro-active 'customer-driven planning process' so that problems could be found and solved at the very beginning of the product development and fewer people have to deal with the problems at the later stages (Day, 1993). Some research has demonstrated the benefits of QFD in reducing quality related problems (Ahmed *et al.*, 2003). Mahdavinejad and Abedi used QFD in implementation stage of design process for comparing two parks. QFD is a new technique in the field of engineering and a method used to identify critical customer attributes and to create a specific link between customer attributes and design parameters. Our investigations show that the applicability of QFD as a strategic decision-making tool in the field of sustainable design process. The demands of people as the most determining element in design process, may guarantee the success in operation stage. The developed model of QFD is to prioritizing demands and requirements of citizens regarding neighborhood parks (Mahdavinejada and Abedi, 2011). Qualitative Research Method is adopted in this paper which being supported by depth interview technique with questionnaire.

2.2. Research Question

How can the users and potential users to participate in design processes are involved?
When can users take part of the design process that optimized?

2.3. Participant

The first step in the application is to identify the expectations of park users. To achieve this purpose, several methods can be used to establish customers' expectations: survey, interviews; questionnaires; observation, etc. A pilot questionnaire survey was made based on literature review and observation, and it was given to 36 park users. The final survey questionnaire was modified based on the pilot study. Results of customer surveys, interviews with park users have constituted the entries of House of Quality.

3. LITERATURE REVIEW

3.1. Sustainable Landscape Process Methods

3.1.1. Community and Advantages of Participation

Concepts such as 'community' and 'community participation' have been intensively problematized in recent decades in both developed and developing countries. Contexts are indeed different and varied (Guha, 2000). The word 'community' is an umbrella term that is defined and applied in a myriad of ways (Ife, 2002). Citizen participation is, however, a lot more than just consulting people for the successful resolution of social, cultural and economic issues related to environmental conflicts. The primary goal of participation is to give proper responsibility to people for, and control over, their lives (Lahiri-Dutt, 2004). The importance of community participation has been emphasized in the 5th Development Plan of Islamic Republic of Iran that highlighted the necessity community-oriented approaches, especially in landscape architecture.

3.1.2. Placemaking

In the U.S., research on communities began earlier and 'Placemaking' was proposed to efficiently plan and design a community in 1995 (Shibley and Schneekloth, 1995). Placemaking is a quiet movement that reimagines public spaces as the heart of every community, in every city. It's a transformative approach that inspires people to create and improve their public places. Placemaking strengthens the connection between people and the places they share. Placemaking is how we collectively shape our public realm to maximize shared value. Rooted in community-based participation, Placemaking involves the planning, design, management and programming of public spaces. More than just creating better urban design of public spaces, Placemaking facilitates creative patterns of activities and connections (cultural, economic, social, and ecological) that define a place and support its ongoing evolution. Placemaking is how people are more collectively and intentionally shaping our world, and our future on this planet (Project for Public Spaces, n.d.). Part of the problem relating to the recognition of effort in this context may be the state's inability to acknowledge informal processes as place-making. From an official perspective, the construction of urban places is normally associated with 'planning', and 'participation' in planning, which is formally structured, initiated and implemented. The longstanding association of 'planning' with regulatory systems (Campbell, 2002) means that it frequently fails to account for the multitude of other activities involved in the social and physical construction of place. Placemaking, then, offers potential to capture activities involved in the construction of place, which overlap with, go beyond, or fall outside formal 'planning' in this sense.

As an analytical lens, place-making offers a cross-cutting perspective on activities which are often categorized as either formal (such as planning by the state) or informal (such as land invasion by settlers). In this way, it offers a wide view of influences involved in the spatial and social construction of place, without resorting to standard binary divisions. A place-making lens offers the potential to see all types of activity as equally valid objects of study in the construction of a particular place, in an effort to move beyond normative judgments often entailed by binary conceptions. It allows a perspective which cuts across scale, to include activities in which individuals, families, streets, committees, neighborhoods, areas, representatives, municipal departments, and so on mouay all be involved. The benefit of a place-making perspective is that it values these analytical categories equally: therefore the individual place-making activities of one resident are as important as those of the city council, in analytical (although not necessarily normative) terms. The focus is provided by place, rather than by pre-ordained typologies or hierarchies of activities (Lombard, 2014). Intheory placemaking represents five section and equal with a transformation from voice of customer. These factors based on literature review of place making and observation (Table 1).

Table-1. Requirements of users

Access and connection	1. Having continuity directions
	2. Having connections to both directions
	3. Legibility Directions
	4. Walk around the paths being
safety	5. Tangible and non tangible Care
	6. Proper lighting at night
Health	7. Health Rates
Sociability	8. participative
Vitality	9. Economic vitality
	10. retail sales

3.2. Participation in Process Design

3.2.1. Process Design

The design process is not linear but dialectical, taking the form of an argument between problem and solution. 'It is clear from our analysis of the nature of design problems that the designer must inevitably expend considerable energy in identifying problems confronting him (Moughtin *et al.*, 1999). To produce an object-design and, as far as necessary, a realization design, one may want to design the design process itself. However, as in the realization process, in many cases already some kind of design process may be in place. Experienced individual architectural or engineering designers, or small teams of them, tend to use informal procedures for their design processes, which they have developed over time through their initial professional training and through subsequent experimenting and learning…Professionalization of process design has progressed much less than in object and realization design. As we will see this may be related to the fact that in object and realization design one designs respectively material objects and processes with strong material elements, while in process design one designs human action systems, which are of a fundamentally different nature (Aken, 2005). It seems more likely that design is a process in which problem and solution emerge together. Often the problem may not even be fully understood without some acceptable solution to illustrate it. In fact, clients often find it easier to describe their problems by referring to existing solutions which they know of. This is all very confusing, but it remains one of the many characteristics of design that it so challenging and interesting to do and study. A map of the design process shows this negotiation between problem and solution with each seen as a reflection of the other (Lawson, 2005). Design is seen as a process of negotiation between problem and solution through three activities, analysis, synthesis and evaluation.

3.2.2. Importance of User's Participation in Process Design

Functionalism, Design Research and Design Methods all belong to Design Participation for innovation at the role of designer autonomous design participation. The next two types are those working in the in-between spaces. Community Architecture, Participatory Design, Collaborative Design, and Inclusive Design are examples of Design Participation for collaboration that are one of the mixed realms of designer + user (Lee, 2006). Armestrong (1993) observed that the individual has a natural claim to participate in decision making related to his/her situation with both

psychological and social needs to feel control over his or her own life conditions. He explains that decisions become better when the persons who are affected become a part of the decision making process (Armestrong, 1993). if one longs for decision making and esteems the design of expert and participative technical solutions over those designed through , object and realization design, the technical/ participative approach is likely to be used. Main stages of the design process can comes into account a general decide model Identify, design, selection, implementation and evaluation of environment are the main stages of the design process (Mahdavinejada and Abedi, 2011).The literature models identify participation as having three key roles: development of participation for concept evaluation before design; and development of general rules for participation during design; and evaluation of design success after design.

4. CASE STUDY USING THE CONCEPTUAL MODEL

Various applications within the literature can be grouped under three categories as: QFD implementations before the design stage; QFD implementations during the design stage and QFD implementations after the design stage (Dikmen *et al.*, 2004).

4.1. QFD Implementations before the Design Process

The idea is that people are invited to influence the decisions made by the organizers by expressing their positions. People are encouraged to take the opportunity to have their say. Their comments are then collected using different methods and are used to inform policy reforms or civic education campaigns. These consultations are initiated by policy-makers, public service agents and other public sector figures. Since most of these projects are policy-oriented, their aim is to understand some specific public issues from the policy makers' perspectives i.e. top down approach from the world of experts. Designers are part of the expert group that give advice on the construction of the project (Lee, 2006). The beginning of a new design, the designer can work on very limited information that may justify putting ideas to consider adequate. However, it is very unusual to find that the design was completed in fulfillment; initial ideas are translated into reality without any revision.

QFD was originally proposed, through collecting and analyzing the voice of the customer, to develop products with higher quality to meet or surpass customer's needs. Thus, the primary functions of QFD are product development, quality management, and customer needs analysis. Quality management and product development are achieved in QFD through customer needs analysis that, in fact, is always the very first step of a QFD process and is thus an important functional field of QFD (Chan and Wu, 2002). Weight of technical measures by multiplying Requirement importance of each customer with respect to the same row and improvement factor column is calculated (see Table 2).In this fig A Park is a park that will be developed in the future. In order to decide on specific goals for technical measures, the implementation of rival park (South Park Police) was evaluated according to each technical measurement.

Table-2. HOQ matrix (before design process)

													PLANNING MATRIX				
STAKEHOLDER REQUIREMENTS	MANAGEMENT RESPONSE	Requirement importance	Open path	Intersection	Signpost	Pedestrian direction	**Centers and individuals to care**	Lighting equipment	Health service equipment	Places and social gathering	Business units	Retail sales	Park A	South Park Police	Goal	Improvement factor	Weights
Access and connection	Having continuity directions	3	9	9		1							3	2	3	3	9
	Having connections to both directions	4	3	9	9	1							2	4	4	2	8
	Legibility Directions	9	1		9			9					4	3	4	1	9
	Walk around the paths being	4	1			9	3	3		1		3	4	4	4	1	4
Safety	Tangible and non tangible Care	9					9	9	9	1	3	3	3	2	3	1	9
	Proper lighting at night	7	1	1		3	9	9	1		3		3	3	3	1	7
Health	Health Rates	9	1			3		1	9	3		1	4	3	4	1	9
Sociability	participative	3								9			3	2	3	1	3
Vitality	Economic vitality	3					3				9	9	4	4	4	1	3
	Retail sales	5				3	9				9	9	2	3	3	1.5	7.5
	Priorities		68	70	117	106	210	184	169	67	120	120					

The results achieved in Table 2 shown that, the four most important technical measures which contributed to the success of the project were; 'Having continuity directions', 'Legibility Directions', 'Tangible and non tangible Care' and 'Health Rates'.

4.2. QFD Implementations during the Design Process

This type of Design Participation is based on the spread of community action and social movements fighting for social democracy in the 1960s and early 1970s. These projects and proposals are reactions from the design community to critiques from the public, especially those against functionalism and form-oriented design practice. These groups react and work in an area where abstract and concrete space merges. They form platforms for designers and users to interact in order to get better design feedback. Some design community members have developed new methods to interact with users and are initiators of Design Participation for collaboration. Their aims are to encourage user involvement as an extension of design processes and an enhancement of user experience. These new methods can be divided into two main applications: community based environmental design and product development, especially in IT system design (Lee, 2006). After QFD implementations before design process the decision-making process implement during design process. Goals have been set in which exist different limitations of design with design tools such as computer. The end affected the revised weights of the requirements. When the revised weights, which show the order of importance to the decision-makers has been investigated, it is observed

that many of the weights such as' Having connections to both directions' have been increased. Setting goals by benchmarking the performance of the rivals increased the weighting of the customer needs requiring urgent improvements. According to the results obtained, the two most significant customer requirements have been ranked as; 'Having connections to both directions', and 'Legibility Directions' (Table 3).

Table-3. HOQ matrix (during design process)

													PLANNING MATRIX				
STAKEHOLDER REQUIREMENTS	MANAGEMENT RESPONSE	Requirement importance	Open path	Intersection	Signpost	Pedestrian direction	**Centers and individuals to care**	Lighting equipment	Health service equipment	Places and social gathering	Business units	Retail sales	Park A	South Park Police	Goal	Improvement factor	Weights
Access and connection	Having continuity directions	3	9	9		1							3	2	3	1	3
	Having connections to both directions	4	3	9	9	1							4	4	4	4	16
	Legibility Directions	9	1		9			9					2	3	3	1.5	13.5
	Walk around the paths being	4	1			9	3	3		1		3	3	4	4	1.33	5.32
Safety	Tangible and non tangible Care	9					9	9	9	1	3	3	3	2	3	1	9
	Proper lighting at night	7	1	1		3	9	9	1		3		4	3	4	1	7
Health	Health Rates	9	1			3		1	9	3		1	5	3	5	1	9
Sociability	participative	3								9			1	2	2	2	6
Vitality	Economic vitality	3					3				9	9	3	4	4	1.33	4
	Retail sales	5				3	9				9	9	2	3	3	1.5	7.5
	Priorities		68	70	117	106	210	184	169	67	120	120					

4.3. QFD Implementations after the Design Process

In past research, Mahdavinejada and Abedi illustrated Actions of A categories will be dedicated to the rows that park designer should evaluate rival (South Police Park) and possibly to an imitation of it. Because of customer view, South Police Park is in conditions better than North Police Park. Actions of B categories shall be adopted in circumstances that South Police Park advantage is less than North Police Park. We can evaluate along with the South Police Park other projects intended to pay them among the best designs can be selected. Actions of AC categories: In these conditions, the South Police Park and Police Park of the North don't have good conditions and better to designer looking for new ideas. For instance, HOQ shown that, 'Legibility Directions' is customer requirements and located in Actions of A categories and possibly to an imitation of South Police Park. In the relationship matrix of the HOQ matrix, there are the highest the relationship matrix of the HOQ matrix between 'Number of signpost' and 'Number of lighting equipment' and a medium relationship with 'Number of directions without deadlock'. The

relationship matrix of the HOQ matrix indicate 'Number of signpost' technical specifications no negative impact would be on other technical characteristics But there is negative correlation between the ' Number of lighting equipment ' and ' Number of centres and individuals to care for ' That is increasing ' Number of lighting equipment ' from ' Number of centres and individuals to care for ' is reduced. Designer examining on South Police Park a few ideas and test innovative engineering, Legibility Directions according to two technical characteristics increases (Table 4).

Table-4. HOQ matrix (after design process)

													PLANNING MATRIX				
MANAGEMENT RESPONSE / STAKEHOLDER REQUIREMENTS		Requirement importance	Open path	Intersection	Signpost	Pedestrian direction	**Centers and individuals to care**	Lighting equipment	Health service equipment	Places and social gathering	Business units	Retail sales	Park A	South Park Police	Goal	Improvement factor	Weights
Access and connection	Having continuity directions	3	9	9		1							3	2	3	1	3
	Having connections to both directions	4	3	9	9	1							3	4	4	1.33	5.32
	Legibility Directions	9	1		9			9					2	3	3	1.5	13.5
	Walk around the paths being	4	1			9	3	3		1		3	2	4	4	2	8
Safety	Tangible and non tangible Care	9					9	9	9	1	3	3	3	2	3	1	9
	Proper lighting at night	7	1	1		3	9	9	1		3		2	3	3	1.5	10.5
Health	Health Rates	9	1			3		1	9	3		1	2	3	3	1.5	13.5
Sociability	participative	3								9			2	2	2	1	3
Vitality	Economic vitality	3					3				9	9	2	4	4	2	6
	Retail sales	5				3	9				9	9	2	3	3	1.5	7.5
	Priorities		68	70	117	106	210	184	169	67	120	120					

In order to be able to compare the data from the user requirement with the weights from the QFD implementation in three stages of design process, the user evaluation scores first had to be translated into relationship matrix. This was done as follows: the difference in user evaluations between W1 and W3 was calculated taking into account 'Tangible and non-tangible Care'.The rank of 'Legibility Directions' and 'Health Rates' equal with rank of stakeholder requirements. Compared with the result of weights from the QFD implementation in three stages of design process, the ranks achieved by total of weight have differences. Results have shown that the sum of the weights in column W2 is more than column W1 and W3, Furthermore W2>W3>W1>RI(Table 5).

Table-5. Rank of three stage of design process with QFD implementation

Stakeholder Requirements (SR)		Requirement Importance (RI)	Weights(QFD implementations)		
			Before design process(W1)	During design process(W2)	After design process(W3)
Access and connection	1.Having continuity directions	3	9	3	3
	2.Having connections to both directions	4	8	16	5.32
	3. Legibility Directions	9	9	13.5	13.5
	4.Walk around the paths being	4	4	5.32	8
Safety	5.Tangible and non tangible Care	9	9	9	9
	6.Proper lighting at night	7	7	7	10.5
Health	7.Health Rates	9	9	9	13.5
Sociability	8.participative	3	3	6	3
Vitality	9.Economic vitality	3	3	4	6
	10.Retail sales	5	7.5	7.5	7.5
	Total	56	68.5	80.32	79.32

5. CONCLUSION

The success of design clearly depends on the relationship between the design and the participation in three stages of design process. Many landscapes designed for further use to customers where as this research suggests that the introduction of research into design can lead to a universal process without a loss of creativity or synthesis. It also provides flexibility for the individuality and prescription that are inherent parts of design. Finally, the model illustrates that the stages presented by the literature equal during design process, and 'During design processes a little more than other stage of design process. The model provides the justification and rationale for the interaction of participation and design in the design process. Other advantageof this model is associated with manipulating the designer combined with the requirements to keep them up to date At all stages of the design. As a communication support, requirements must be regularly updated. Therefore, use of QFD tools is an effective aid in this field.

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