

Universal Design and Social Sustainability in the City: The Case Study of Tehran Iran

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Abstract. Following the proposal of Universal Design in 1974, a public society was founded in Iran in 1981, in order to aid the disabled victims of the Iran-Iraq war. Official authorities have also made legislation on this topic. During the last three decades many efforts have been made to apply this concept in public spaces. Unfortunately these have not succeeded. It means despite the existence of inherent rules and regulations and the general will to apply the principles of Universal Design in Tehran, urban spaces are still an improper environment for the independent presence and movement of people with disabilities. This problem is considered a serious threat for social sustainability in Tehran.

The main goal of this research is finding solutions for increasing social interaction and greater participation of people with disabilities in public spaces by applying Universal Design. The research is seeking to answer these questions: What is causing inefficiency in the regulation of Universal Design in Tehran? Why is social participation by people with disabilities limited in Tehran? Which factors are contributing to Universal Design in Tehran? The research is based on applied theory, field research methods and a mixed qualitative–quantitative approach. In addition, and the results include both empirical and functional solutions.

The consequences show that many of problems are rooted in cultural issues. The people must attend to disability as a public concern which can involve everybody. They must comprehend that all the members of the society, regardless of their physical condition, have the right to use public facilities independently. The second problem is related to lack of any integrated approach to applying Universal Design. This research proposes some solutions such as preparation a Universal Design master plan, an integrated approach for implementation project in all organizations, and public education for improving citizens' knowledge about Universal Design.

Keywords. Universal Design, social sustainability, people with disabilities

1. Introduction

Following the growth of technology, medical science and comprehensive health in the world, life expectancy is increasing. The decrease in births and the population growth control will introduce a new challenge, humanity will experience aging generations. On the other hand, it is expected that future generations, will have equal possibilities to use the facilities in their environment, regardless their physical level of ability.

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Many scientists believe the sustainable development is a comprehensive concept that satisfies humanity's entire needs. But in fact, the sustainable development has not been able to ensure the desirable life quality for the population and the satisfaction of the human society. In this context some of theorists have considered to the "justice oriented urbanism" as an appropriate substitute to the pattern of "sustainable development" in this century. Normalization, accessibility, barrier free design and the Universal Design are all concepts formed through this approach in the architecture.

In this research, firstly, studies were conducted through the theoretical pioneers point of views and the criteria of each theory was then applied to the research results on buildings and public spaces in Tehran (Iran). Considering the large number of people with disabilities as a consequence of the Iran-Iraq war, the authorities have made great effort to implement Universal Design. But unfortunately, in spite of all such efforts, the presence of the people with disabilities in the city is very limited, and with inadequate vitality.

This study is investigating the reasons for the absence of people with disabilities in the city. It has also been considered the solutions for the problems, and contributing factors to applying Universal Design and at the same time monitoring methods for its implementation. It seems that the sustainable development without the social sustainability is unrealizable.

2. Background

2.1. Defining the Research Problem

The principal challenge in the 21st century are the climate and demographic changes.

Following the numerous attempt, the scientists find sustainable development as a comprehensive solution to the climate changes and Universal Design as that solution to the demographic changes [1].

The concept of the sustainable development was presented in 1976 for the first time, have been presented a tridimensional pattern for the concept of sustainable development in environmental, social and economic aspects. But in fact, in applying the sustainable development, the social and economic dimensions have been omitted. That leads to decreasing the sense of satisfactory in the human life. In this context the concept of Universal Design as an effective theory to fulfil the social sustainability has been considered.

2.2. The Necessity of the Research

Regardless to the nature of human life, which his abilities are changed in his life cycle, during the eight years of Iran and Iraq war many victims in Iran experienced disability. Besides, according to the existing statistics, 10% of the entire population in Iran is formed by men having an age 35-50 [1]. It means that the 90% of the population includes children, women, elderlies and groups of persons that are not able to move easily in the urban spaces.

During the last three decades many efforts including preparing rules and regulation or implementation projects have been made to increase the social interactions. Unfortunately, the evidence shows in spite of the existing regulations and the public

will to applying Universal Design, the urban spaces in Tehran are still inappropriate for the independent and non-mediated presence of the people with disability.

In this article the authors have tried to find the reasons for the unsuccessful results in this regard in Iran and aiming to find solutions for the existing problems.

2.3. The Questions of the Research

In this research Tehran has been selected as a statistic sample, and this research through studying the public spaces, life circumstance and social behavior of the people with disability in public spaces is looking forward the answers to the following questions:

- What is causing inefficiency in the regulation of Universal Design in Tehran?
- Why is social participation by people with disabilities limited in Tehran?
- Which factors are contributing to Universal Design in Tehran?

This paper has tried to analyse existing circumstances and find the potentials to solving the problems.

2.4. Research Goals

The goal of this research is to find solutions to increase the quality and the level of desirability of the living spaces. A quality level where all the members of the society without restrictions, freely and with interest can participate to the social activities, feeling free and experiencing to be part of the living environment.

Additionally, other goals are including transformation of the opportunities in the Iranian social spaces to strengths, and increasing the social interaction. In this research we have looked for ways to overcome the difficulties for the applying the regulations and policies and the methods to monitor progress.

2.5. Research Method

This research is based on the applied theory purpose through the field research method. In the beginning the records, publications and documents have been studied in the libraries, then followed by the identification and study on the site of the buildings, public spaces and passageways in Tehran. Research tools like plans, graphs, pictures plans, imaging and statistic documentation have been used.

The following step was the hypothesis formulation based on researches experiences. In order to testing the hypothesis interviews, surveys and questionnaires have organized, this study follows the qualitative-quantitative research approach, and the selected sample is included people with disability in the public spaces of Tehran, samples selecting is based on nonprobability and randomly approach. Tools like applications, interview card, questionnaires and forms have been used. Then the collected data have been analysed by the deductive approach, and solutions have been proposed.

3. Definition of technical words

3.1. Sustainable Development

According to the description of Norway's Prime Minister Gro Harlem Brundtland in 1987, "sustainable development is the development that satisfies human's actual needs, without endangering next generation's ability to provide their needs" [3]. Sustainable development is presented through three environmental, social and economic dimensions

3.2. Universal Design

Mace is one the pioneers who developed the Universal Design concept in 1998. Universal Design is the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design.

The intent of Universal Design is to simplify life for everyone by making products, communications, and the built environment more usable by as many people as possible at little or no extra cost. Universal Design benefits people of all ages and abilities. Equitable use, Flexibility in use, Simple and intuitive, Perceptible information, **Tolerance for error**, Low physical effort, Size and space for approach and use are the seven principles for Universal Design [4].

4. Research Background

To find the reasons of successful application of Universal Design in some countries and the reasons of failure it in other parts of the world it is necessary to review backgrounds.

In Japan in 1964 the concept of normalization was applied for the first time. One year later, the citizens began their effort for the Universal Design. Then, in 1981 the year was entitled to the people with disability and in 1994 the law for the appropriation of the buildings was approved. In 2000 it transformed to the laws and in 2006 the unified and new appropriation law were approved. This process lasted 30 years and today Japan is one of the progressive countries on Universal Design.

Regarding Iran, this concept was introduced in 1981 during the Iran-Iraq war. Five years later the legal authorities edited the regulations regarding public and educational buildings. Two years later a book entitled the "Public spaces and people with disability", containing the regulations was published by authorities. Five years later the law for the support of the wounded in the war was approved. The process continued for 20 years, but Iran is still far from ideal conditions.

5. Analysis of the Conditions of Universal Design in Iran

5.1. Physical-Spatial Structure

In this regard the scientific-functional project including the supervising of Universal Design applying in 200 buildings, 4 passages, 39 squares and 26 parks in Tehran was implemented and interviews with people with disabilities was done.

In field research inspections including details such as stairs, ramps, lifts, entrances and so on were conducted. Also in public spaces, the existing barriers, the signs and others were considered. Interview of target groups and NGO s was done.

According the site visits in Tehran, the problems can be classified in three categories: Phase of design (see Figure 1), phase of operation (Figure 2) and phase of planning (Figure 3).



Figure 1. Inattention to the Universal Design principles during the phase of design



Figure 2. Inattention to the signs and equipment for people with disabilities in operation



Figure 3. Lack of a continuous access network

5.2. Social-Cultural Structure

According the site visits, some problems are caused by structural considerations and others have cultural and social roots. It seems in Iran social consideration outweigh to other causes. To test this hypothesis people with disabilities have been interviewed about four key subjects. Quality and quantity of accessibility in the city, obstacles against social interaction and the reasons for isolation of people with disability.

Most of the people interviewed believe that just 10% of the urban spaces are usable for them. The reason is related to lack of integrated network to connect the existing equipment. For this reason existing facilities and appropriate spaces are not usable. So they prefer to ask help others for their personal affairs which leads to harms their human dignity.

Regarding to sufficiency of accessible spaces should say those are enough, but because lack of public concern to disability, separation and isolation was happened. This separation leads to distinctiveness and discrimination so his dignity is offended.

Most of them complain of social behaviours. They say citizens don't respect to their rights, or in some cases they exaggerate the sense of compassion or they have a discriminatory behaviour. This means that any abnormal positive or negative attention hurts the people with disability, pushing them to the unpleasant sense of isolation. They want that concerning to their right for having an independent life entirely.

Sometimes there is this approach between specialists. For example when they say "regulations for people with disability", "park for people with disability", "park for women", this distinguishing point of view which leads to discrimination, isolation and consequently the rupture of social ties. This is the most important factor that limits the presence of the people with disability in the society.

6. Data Analysis and Proposed Solution

6.1. The Empirical Methods to Face the Problems through the Target Groups

Among 60 people, interviewed, four persons have been considered particularly. One of them is a young girl born with disability. She is a professional graphic artist. Because of her physical disorders she prefers to work in her private house. Different commercial companies are her clients. She can successfully express the difficulties of target group by a graphic approach. There is a brochure was designed by her to present Universal Design concepts for primary school [5].



Figure 4. Graphic expression of difficulties facing people with disabilities

Another person is a woman at the age of 15 during a surgery operation lost the ability to walk, she is a Ph.D. course student and a champion in sport. Additionally, she is the chief of the cultural commission of international union of people with disabilities WDU. Also, she has cooperation with NGOs of this international union, she believes that:

Physically disable people do not need support, it is enough that their rights are respected, and their presence in the society is recognized officially. She is trying to change the approach of the people through her social activities [6].

Another case is a man who when he was nine years old he fell down from a building, hurting a leg and actually he uses a walking stick. He is the founder of a NGO

active for the support of people with disability and their rights through social activities. He is trying to create job opportunities for the people with disability. He believes:

If we build the cities for the persons and we accept the man is the axe of development and if we pay tax for urban services, so everyone should have a comfortable life, and a barrier free city, accessible and liveable, especially of people with disability [7].

The fourth person is a mechanical engineer, specialized in medical engineering. He is the executive director of a company specialized in medical equipment for people with disability. He is the founder of a society where 70% of the employees are people with disability. He is also responsible of a NGO and author of many books regarding the people with disability and their problems. He has also registered two inventions for people with disability' equipment. He says:

“The first problem in our society is the lack of a public education about people with disability. Without a public preparation and until the disable is seen in a humiliating way, this approach causes troubles to the people with disability, because they are scared what is unpleasant. If these cold behaviour is over it will have two important effects.

1. It encourages the people to work.
2. It makes the conditions that the problems are identified and the appropriation process begins. He believes that most of the problems regard the difficulties of movement a problem that exist also for the elderlies” [8].

6.2. Functional Solutions to Deal with the Challenges of Universal Design

6.2.1. Disability as a Public Concern

The public believe everybody in his life can face similar problems of disability. Disabilities caused by age, accidents, pregnancy, and illnesses can harm everybody and it doesn't violate the citizen's rights. The people regardless their physical ability must have access to the environmental facilities.

6.2.2. Disability as a Characteristic and not a Stigmatization

Feelings like fear, stress, unavailability, panic, giddiness, shame, loneliness in urban environment and public spaces are characteristic to the people with disability, and this is the reason that they have problems to establish relationships with their environment. The stigmatization may happened by himself and consider the disability a dishonour or a sensation dictated by the other people, having also roots in personal and familiar believes

6.2.3. Preservation of Human Dignity of People with Disability

In this regard cultural approaches had their negative impact on engineering sciences, because the engineers and other responsible persons that are involved in activities to create appropriate spaces for the people with disability, consider these activities useless formalities and not as a mandatory action. In some case where they have to respect the regulations, they “satisfy” the requests and needs of the people with disability, using hidden or unutilized spaces, spaces for the people with disability access, ramps, and rail guards and so on. These structures are designed but in fact they are useless and

somehow try to ignore the human dignity of the people with disability, stressing on their physical peculiarity.

6.2.4. Passing from a Compassionate Approach to a Right oriented Approach

Other cases that have a cultural base is the feeling of compassion that the people has. This fact is caused because they don't know how should they act and establish contacts with the people with disability

Sometimes we assist to the behaviour of adults that causes unpleasant sensations to the people with disability. When they insist to help a disabled person, it create the conditions that he feels really unable, a person that sees his personal independence blocked and imprisoned. In reality the spaces and personal fields must be designed in a way that the people with disability can feel free to move and act without the help of other persons. This is the sense and concept of R. Miss regarding the appropriation.

6.2.5. Spirit of Amity and Human Interactions

In many cases it is impossible to applying structural repairmen's in order to Universal Design, because of historical and heritage considerations. In this case public education can be a solution, personal training to help the people with disability to access can replace to expensive constructional repairman's.

Inattention to the signs and urban indications like the parking for people with disability, special chairs for people with disability in the urban furniture or the priority to use the lifts for the people with disability, all show the lack of a cultural education to face the problems of the people with disability [9].

7. Summing Up and Classification

7.1. Classification of the Existing Problems

To sum up we can classify the existing problems in Universal Design into four subjects:

7.1.1. Weakness in Design

Sometimes the designers ignore the regulations of Universal Design. The negligence happens when the designers ignore the standards or when they are not mandatory, or when they consider these acts useless or luxury operations. Saving on some operations during the building phase they do not respect some of the regulations.

7.1.2. Problems in Reconstruction

Unfortunately many buildings were built after the edition and approval of Universal Design regulations, but ignored at that time, later when they are obligated to respect the regulation, they must sustain high costs, demolitions, reconstruction and equip the spaces.

7.1.3. Disorders during the Exploitation

Most of the dissatisfaction of people with disability and their absence related to social interactions issues [10]. They believe if their rights are respected and their presence is not considered unnecessary, they can independently participate to the social activities. Some equipment for Universal Designs and the obstacles to their exploitation are presented in Table 1. Some damages and the reasons that cause them are presented in Table 2.

Table 1. Some Equipment for Universal Designs and Obstacles to their Exploitation

Equipment for Universal Designs	Disorders in operation
Lift for people with disability	Obstacle in use via putting vase
Tactile paving in pavement	Obstacle in use by shop goods or parking cars
Separating sidewalks and roads	Obstacle to enter of bicycle in pavement
Sanitary services for people with disability	Occupied by else in peak times & neglect the sign
Seats for handicapped people within the train	Occupied by else in peak times & neglect the sign
Elevator for people with disability	The influx of healthy people to use the elevator
Handicapped people parking signage	Occupied by healthy persons Ignoring the standard distances park other cars
Prevision of ramp for wheelchair	Installation in subsidiary entrance

Table 2. Damages and the Reasons

Damages	Reasons
Disregarding Universal Design in the design	Lack of mandatory & integrated legislation
Applying Universal Design in an existing building	Repetitive costs for demolition & reconstruction
Neglect to Universal Design as an urgent matter	Lack of public concern as an inclusive needs
Lack of sufficient supervision to applying	Lack of rigid legislation for disobedient

7.2. Effective Solutions to Answer the Challenges Ahead

7.2.1. Edition of a Comprehensive Appropriation Plan

The partial vision of Universal Design had some consequences such as many local parks or public building but for the lack of integrated approach to applying this concept there is no continuous network to connect them. So, urban facilities are not available for people with disabilities. The prevision of a comprehensive plan for Universal Design connects all the points and spaces and ensuring the active and multilateral participation, increasing the social interactions and leads to social sustainability.

7.2.2. *Inter-sectoral, Integrated and Obligatory Legislation for Universal Design*

Legislation for Universal Design have been done in Iran. But they are not hardly imposed, it is possible to obedience. It is necessary to hard supervision and monitor process of Universal Design introduction during the design, building phases and the emission of the building works end license, defining hard penalties for obedient.

Another fact related to the lack of awareness of executive offices about other organization activities. For this reason, Universal Design is not correctly realized. For example, installation of a lighting column, or a letterbox, a telephone cabin or wastewater installations are located on tactile. All these problems are the direct consequence of the lack of an integrated approach to the Universal Design.

7.2.3. *Public Education and Realization*

The public education includes not only whole citizens but also the target group (people with disability). In order to make public awareness about necessity of new definition of sustainable development which leads to social sustainability and equal opportunities to use the environment and urban facilities [11]. To know about citizen's right, and the ways for social supervising and reporting to authorities in disorder cases. This education should began from the lowest levels like the primary schools, and then generalized in whole of society to accept people with disability within the society in equal rights. In order to realization of this matter it is necessary to have an intersectional approach to Universal Design. For example, production of dolls with disabilities helps children to learn interaction with their classmate with disabilities.

8. Conclusions

The Universal Design presents a vast spectrum of efforts for social sustainability that provides an impartial platform with equal opportunities for all under the protection of law.

Answering the initial question can assert the lack of accountability and executive guarantees, besides miss management and inefficient administrative system as well as laxity of laws are the main reasons. Another reason is related to lack of public concern to Universal Design issue. The third reason is lack of integrated intersectional approach to applying Universal Design.

Regarding the second question can say the lack of public awareness about rights of people with disability, lack of well-defined laws and poor law enforcements are the reasons. It is necessary to find comprehensive solutions in order to passing from a compassionate approach to a right oriented approach to preserving the human dignity of people with disability.

Considering to the third question can assert that the application of Universal Design without an interactional approach will not be possible. Intervention and cooperation between experts in different fields such as urbanism, architecture, social behaviour, electronic technologies, installation systems specialist, telecommunication, informatics network experts and so on can be effective in applying Universal Design entirely. In the other word both hardware and software solutions are contributing factors.

This approach will permit us to create a fair platform where all the members of the society, can live together without discrimination, with strong social ties and sense of

belonging. This means that the elderlies that spent their entire life in a specific environment, having many memories and a deep sense of belonging to their habitation place, can through the facilities offered by the Universal Design, through the physical flexibility and ease of the use of the spaces, remain in the same places, avoiding huge expenses of financial resources for the demolition and reconstruction of their habitations, in order to satisfy their needs. This approach will protect the familiar links, respecting the rights of the generations.

By Universal Design, people with disability can like the other members of the society, have an active participation in the social spheres, having an independent activity, enjoying at the same time the sense of human dignity, being respected and enjoying the attention of the society, like the other members.

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