International Academic Institute for Science and Technology

International Academic Journal of Science and Engineering Vol. 3, No.2, 2016, pp. 201-211.

ISSN 2454-3896

International Academic Journal of Science and Engineering

www.iaiest.com

Designing Tehran Information Technology Center Abbas Abad Areas with Cybernetic Architecture Approach

E. Dorostkar, S.Panahi*

Department of Architecture,Karaj branch,Islamic Azad university,Karaj,Iran

Abstract

Nowadays, information technology are so intertwined with people's lives as one of sciences having a history about a century, that imagination of an even in the world without role playing by IT[1] is impossible. It has even influenced other sciences and disciplines such as management's, which is affected by its full capacity. That is why the leading countries and cities are to seek access to information technology and its development as a sustainable capital and focus on creating centers, in which could use synergy of companies and Governments' capabilities in direction of scientific mutations in the sphere of information technology. Examples of centers of its kind in the world are available as abundant in various fields including aviation, shipping, medical and ..., some of them will be discussed in this study. In this paper, we reviewed the methodology, as well as Abbas-Abad lands that consists the site of this research were introduced in this area. In conjunction with research methodology, methodology, data collection, and analysis and in the second part of this paper, titles such as the introduction of Abbas-Abad area in terms of geographical location, slope and topography, geology etc. were presented. The position of the site and examination of such communications, direction of prevailing winds, topography, and slope of land, access of mounted and dismounted connection roads, and chart of the sun path relative to the target site were studied.

Keywords: Information Technology center, Tehran, Abbas Abad areas, architecture, cybernetic architecture

[1] Information Technology

Introduction

According to scientific and technological developments in architecture history, it can be divided into three periods so-called three wave. The first wave named agricultural era emerged in the wake of human being needed livelihood since three thousand years ago. The second wave was industrial age as its starting point can be found in the Industrial Revolution five years ago, which had a profound impact on architecture since emergence and not only changed the form, shape, and construction mode, but also transformed space concepts. The third wave is the electronic age as its beginning point can be spotted at computer and Internet innovations, which was another milestone itself in the field of architectural design (Mahmoudi, 2004, p. 5).

Nowadays, information technology are so intertwined with people's lives as one of sciences having a history about a century, that imagination of an even in the world without role playing by IT[2] is impossible. It has even influenced other sciences and disciplines such as management's, which is affected by its full capacity. That is why the leading countries and cities are to seek access to information technology and its development as a sustainable capital and focus on creating centers, in which could use synergy of companies and Governments' capabilities in direction of scientific mutations in the sphere of information technology. Examples of centers of its kind in the world are available as abundant in various fields including aviation, shipping, medical and ..., some of them will be discussed in this study.

Definition of the words

Cybernetics

In the culture of communication computer knowledge, cybernetics, or Command-line science is formally defined as the science of control and communication in animals, men, and machines; the science of communication and control theory that is concerned especially with the comparative study of automatic control systems (as the nervous system and brain and mechanical-electrical communication systems). Norbert Wiener has proposed the idea in 1948. The wide field of cybernetics theory is raised since 1940S decade as for interdisciplinary studies through connecting a variety of fields such as control systems, electrical network theory, mathematical logic, biology system stability, engineering systems sustainability, and neuroscience. Other scientific fields such as social systems, anthropology, general system theory, psychology, architecture, and designing stepped also into the realm of cybernetics by its subsequent developments (Jalily, 2010, p. 7).

Cyberspace

Cyberspace refers to a set of human internal communications via computer and communications means regardless of physical geography (Haji-Mullah-Mirzaee, 2009, p. 8). ICT[3] provides the possibility of emergence of a network society in which it gives people and communities new fresh identity; offers a new definition for man (Castells, 2001, p. 32).

By this way, there is a new global civilization evolving with new forms of family, work, the new economic system, new political conflicts and, above all, has brought about a transformed awareness and

[2] Information Technology
[3] Information and Communications Technology

knowledge (Toffler, 2001, p. 2). Many definitions and key concepts of the past has undergone transformation by arrival of new communications technology in recent decades, and at present, as "Nicholas Negroponte" states, a kind of world has formed that is digitalized. The architecture has also influenced by this transformation too; once again the meaning of the buildings has changed and the need is felt for new meanings that are suitable for temporary information society (Shoar, 2004, p. 4).

These new dynamic needs, which have caused a wide range of reactions amongst architecture and interior designers, require an appropriate architecture and a building reflecting that architecture. If you consider the idea of "time soul" put forward by Charles Jencks, you will find out that if industry and the industrial revolution in architecture led to construction of work places and industrial plants and to mass construction in residential aspect, you will easily feel the need for new spaces and buildings in information age nowadays (Mahmoudi, 2004, p. 8).

The concept of space

The concept of **space** is a term with no a certain consensus in relation to it yet. That is a concept that has many applications/functions in various fields of physics, mathematics, anthropology, psychology, sociology, and off course, in architecture. Edward T. Hall emphasizes on perception of space through senses such as sight, hearing, smell, and touch determining its coordinates, but admits implicitly that the perception of space through the senses have been affected by issues such as culture, language, and religion. Accordingly, the Eskimos living space is called a vocal-olfactory space, because visual sense is reduced or became even useless in their living environment due to the relative monotony of landscape (Arasteh, 2011, p. 6). According to Kant, the space belongs to the subjective structure of thought rather than being a concept derived from experience acquired from external world. Albert Einstein said, absolute or relative concepts of space both are "free creations of human's imagination; some means to understand our sensory experiences easier"; therefore, space is often borderless (Arasteh, 2011, same page).

Space and architecture

The term "architectural space" has a history beginning since the WWI[4] in Europe that is usually used to describe a place quantitatively; i.e. a large space, small space, massive space, and so on (Memarian, 2005, p. 24). As stated by Quaroni, if human is put within a space scaled as a room, it can be called an architectural space, and if the placed was a city square, it is called an urban space (Noghrekar, 2010, p. 31). Space is a concept that has attracted much attention to it in architectural work and some believe that architecture is basically creating the space. On the word of Bruno Zevi, "the architectural essence neither lies in material limitations created nor in space freedom; instead, the way, through which the space is significantly organized by the process of limiting. Gideon in his famous book, "*Space, Time Architecture*," defines the space as the central core of the architecture. In other word, architectural space is the physical description of "place", in which a part of the human life activities is carried out (Arasteh, 2011, p. 8).

Commonly all architects recognize the space as one of or the most original architectural elements. According to Sir Denys Lasdun, the space is defined as the most complex aspect of architecture, but its distillate at the same time. In his perspective, the space is a target point that architecture must move towards it. Therefore, the space is the ultimate goal of architecture according to his opinion. The different

[4] World War the First

definitions provided for architecture till now has often emphasize the importance of space in architecture, so that many of them share the definition of architecture as the art of organizing space.

Nikolaus Pevsner defines the architectural history as the history of the formation of space by human. Architecture have been involved in all ages with concepts like space lighting, space arrangement, space purity, space lightness and heaviness, space diversity, space being multi-valued, space richness, and so on. Space is the basic element of architecture and the ability to understand and find the key to understanding it depends on space recognition (Kashaf-Rashti, 2011, p. 3).

Space experience

The spacer limited by levels in various forms and meets determined functions; the space created by vertical and horizontal levels is the subject and the essence of architecture. In other words, the main subject and the essence of architectural is in fact the space. In accordance to a modern Space orientation, the good architecture is an architecture that has interiors space and attracts human, trains him, and tames him spiritually; bad architecture is an architecture that its interior space irritates human and scares him (Von Meiss, 2005, p. 26).

William Gibson organized the imaginary electronic space with possibility of entering into it as far as the world was finally predicated to the world formed under technology and at the end of the twentieth century; it established its existence as an integrated network of information and communications interconnecting machine and man. Experience in cyberspace is a subjective experience; thus, the nature of space in cyberspace is perceptual; a perception without the physical presence of man and formed only by his help. Cyber space is a place for learning of minds, thought exchange, and perceptual experiences and therefore, its nature is immaterial same as the mentality.

Experience of space, humans and space

Human and the time factor cause the various experiences and sensations in a space. Man experiences a space with presence in a place and in order to experience new space, he has needs movement and relocation to be able to experience new spaces in new places. In fact, movement in space during the time allows full understanding of space presence. Nonetheless, using technology and digital architecture have provided man the ability to experience many spaces with no delay just by passing the time while staying still in the same place. That is what can frequently be seen in the media architecture as piece of cake. Physical and virtual architecture have formed a kind of symbiosis that the information of architecture aspects is made wider.

Third Wave and electronic revolution have created such conditions that requires aesthetic and functional principles of architecture be revised. Indeed, the history of architecture has been entered to a new direction coincided with the advent of communicational and multimedia technologies. What is worth not to be ignored is the temporary technology followed by architecture that has been significant during all the architecture history, whether in new age or ancient era. That is to be remembered that architecture never emerged to boast human's technological capacity or intellectual ability, but it was set for life (Shahcheraghi, 2005, p. 5).

Some define cyberspace as the Internet, while the Internet is not cyberspace, but it contains all the content that is available and can be used through Internet technology. Cyberspace is a social system depended on the structure created by technology system that consists of people, advantages, capabilities, and various values. In general, one can say that cyberspace has brought a new world; a world parallel to the physical

world was created and supported by communication lines and computers of the world; a world whose the most important characteristics are global exchange of knowledge, secrets, sizes, indexes, entertainment, and activities (Jalily, 2010, p. 14).

Cyberspace, which is formed through information technology development, has affected today's world architecture in different aspects and has changed it too. The profile of these effects can be studied in two different areas at a general glance:

1. The impact of cyberspace on architectural spaces;

2. The impact of cyberspace on architectural design process.

The concept of space has changed combining with cyber so that a new area of activity has started that did not exist in the past. In other words, space concepts have changed by cyberspace. Virtual museum, virtual or cyber cities, virtual stores, computer modeling, etc. are examples of virtual architecture in cyberspace. The following table consisting of cyber equivalents of different architecture spaces shows that the need to build physical spaces is decreasing day by day. No doubt the influence of the Internet and virtual companies and stores will reduce the amount of construction in near future. Hence, cyberspace with its significant presence requires less and less architectural, and finally it will make it unnecessary.

Cyberspace has been able to give a new aspect to architecture and create a new vision and means. Architect deals with a wider range of data day by day to produce its artworks. The increasing data reduces his/her ability to control him moment by moment. Development of software and data expression systems, and information and their monitoring organization in the field of architecture has provided the architect with a new ability, based on the foundation and capabilities of previous systems. These applications have almost been able to replace the previous systems and bear large volumes of logic load of architecture space (Bazrafkan, 2006, p. 8).

Due to the impact of cyberspace on the architectural design process described above, one can distinguish between three types of architecture in the present age:

1. The actual architecture, also called natural or built architecture; the architecture to be built using physical materials.

2. The architectural on paper, also called conceptual/fictional architecture; it represent the projects and plans of buildings and cities that have never been made. This kind of architecture can be named as architecture stopped at the conceptual stage of procedure.

3. Virtual architecture presented by cyberspace modern technologies. Virtual architectural space is a space represented by computers. Virtual architecture provides opportunity to produce a project regardless of limitations of Euclidean space, context, texture, attraction, and regulations and is used to evaluate a project before construction as a more advanced tool than planning and architecting on paper. Cyberspace is used in virtual architecture as a means of providing a true representation of physical space. Architecture experiences fundamental changes in this space, to the extent that there would not be need for designing physical elements and controlling Structural connections of building and respond to climate conditions and so on.

Review of literature

In an article titled "The Concept of Cyber in Explaining and Creating Architectural Space" written in 2010 by T. Jalily, the concept of cyber architecture and its role in defining the architectural space is explored as a modern approach in the field of architecture. The results of this study states that, "basically, architecture is understood in the gap between the real and virtual. Man's inability in implementing what has imagined or dreamed, does not prevent him to develop his inventing ability beyond the world of realities, routineness, possibilities, etc. and to think about new designs in this regard that will promise some new indication for the future. Accordingly, virtual architecture, as an imaginary architecture, smooth the way for innovations have great attraction and will be stimulating for modernization that considers architecture in numerous aspects, with extended acquisition power, highly abstract forms, and very far from what is considered routine. Architecture in cyberspace belongs to the intellectual atmosphere that recognizes architecture being virtually as a principle and in this regard, considers having new computer systems as helpful for representing and delineating the cyber architecture designers' ideas."

In a study entitled "*The Impact of Architecture of Virtual Spaces on the Human Environment*" undertaken in 2010 by Ekhlasi & Ghamary, an exploration was done about the impact and interaction between ICT and architecture in the virtual environment and human environment. This paper first, has discussed the concepts of cybernetics and cyberspace. Then, the new interpretation of space in digital domain, the distinguishing feature between physical space and the new concept of virtual space has been investigated, and at the end, interacting aspects with a virtual environment and interaction of it with the real world, society, and people criticized and the possibility of switching to reside in a virtual environment has responded.

In a study entitled "*The Impact of Technology on the Development of Architectural Space with an Emphasis on Virtual Architecture*" performed by Zahra Kashaf-Rashti in 2013, the science and technology of temporary world in architecture and different kinds of architecture in Electronic world have been studied and understandable spaces is assessed on the basis of these achievements. The results of this study states that cyber is now a familiar term in common language will include all spheres of life to the fullest and architectural space will get cyber suffix too. Profound effects that this phenomenon has left on the people as a habitable space besides the physical space has caused architects around the world consider it as a thinkable issue. Cyber space is introduced as a space requiring to be organized and contrivance.

In a study called "*Cybernetic Architectural: Design for Special Occasions in Humanitarian System*" that has been done by Minati and Collen in 2009, have been studied new features in relation to human settlement using cybernetic architecture. In this study, the persistence of the phenomenon is discussed as a project, modeling in that regard, designing, construction of human habitation, and the ways in which space is available to perform daily activities.

The advent of information and electronic technology promises virtual era in near future that undoubtedly will lead to dramatic changes in architecture. Cyberspaces play an important role in changing the quality and quantity of physical spaces of architecture as one of the aspects of modern architecture. Cyber space is a space full of electronic data, including interconnected network of all communication channels. These cyberspace features will bring broader definition in architecture the emergence of a new form of architecture.

The introduction of the study site

One of the sectors of Tehran near located in Section 7. The name of the sector's main street is "Abbas-Abad" that was changed to "Shahid-Beheshti" after Revolution. The main streets of this sector are Suhrawardi, Apadana, Niloofar, Nobakht, Mahnaz, Andisheh, Surena, Mir-Emad, and Parsa. The district covers an area of 590 hectares, leading from east to Shariati St. (Qasr Cross Road), from north to Resalat Highway (and Abbas-Abad lands), the from and west to Modarres Highway, and from South to Takhte-Tavous (Motahhari) St.



Figure 1. A 3D map of the lands of Abbas Abad (Source: Modernization of Abbas Abad Company, 2014)

The site is located in Abbas-Abad, which is selected in accordance with planning. Since todays there has been much change in the perception of space and space is no more considered as an enclosed place consisting of bricks and mortar, buildings and cybernetic centers represents information are important in informing people in addition to their construction and architectural functions. Urban data center design makes people get familiar with a new form of space visiting the various types of technologies used in these designs.

Due to the proximity of the site to downtown and presence of Institutes, libraries, etc., and because of the constant movement of people from this area, as well as the absence of such a center, people will visit and become familiar with the center and cybernetic architecture.



Figure 2. The position of the site in Abbas-Abad (Source: https://maps.google.com)



Figure 3. Connecting roads close to the site (Source: https://earth.google.com)



Figure 4. Topography and slope of the site land (Source: author)



Figure 5. Mounted and dismounted access to the site (Source: author)

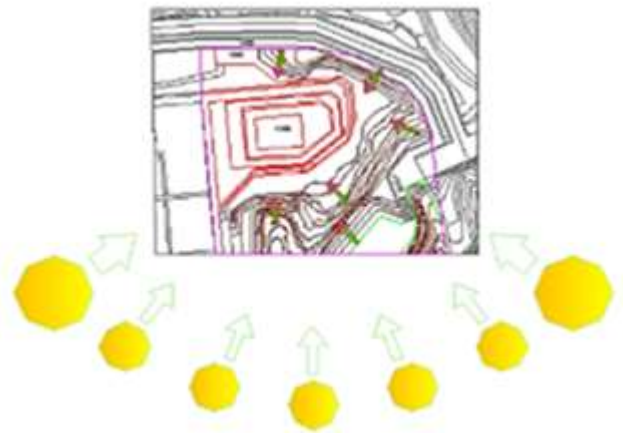


Figure 6. The charts of the sun path relative to the target site (Source: author)

Conclusion

In this paper we reviewed the methodology, as well as Abbas-Abad lands that consists the site of this research were introduced in this area. In conjunction with research methodology, methodology, data collection, and analysis and in the second part of this paper, titles such as the introduction of Abbas-Abad area in terms of geographical location, slope and topography, geology etc. were presented. The position of the site and examination of such communications, direction of prevailing winds, topography and slope of land, access of mounted and dismounted connection roads, and chart of the sun path relative to the target site were studied.

References

Araste, Shiva (2011), Historical evolution of the concept of space, Journal of architectural thinking, No. 24.

Castells, Manuel (2001), the information age: economy, society, culture, translated by Ahmad aLIGHOLIAN and Afshin Khakbaz, Tarhe Now Pub.

Fan Mais, Pierre (2005), Architectural elements from pink to place the translation process knowledge, martyr Beheshti University. Naqsh-e Jahan Pars Consulting Engineers (2005), a strategic document Master Plan, Iran's Supreme Council for Planning and Architecture.

Fardanesh, Farzin (2003), Space, location, architecture: an overview of the architectural elements of the form to book a place, Journal of the Academy of Arts.

Fokouhi, Mohamed Mansour (2002), the theoretical roots and tendencies of architecture, Faza Pub..

Haji Mullah Mirzaee, H. (2009), the virtual space in Islamic-Iranian civilization, Danesh Pub. Number 117.

Jalili, T. (2010), Defining the concept of Cyber and creating an architectural space, the first National Conference and 4th. Conference of Khavaran Institute of Higher Education, Mashhad.

Kashaf Rashti, Z. (2011), the impact of technology on the development of architectural space with an emphasis on virtual architectural space, the first annual conference (National) future building, Mazandaran.

Kashanijou, Khashayar (2003), Architecture in the Age of Information, Abadi Journal, No. 37.

Mahmoudi, M. (2004), Review of virtual architecture, architecture and culture Quarterly, Issue 17.

Mahvash, Maryam (2004), Changes in technology and the quality of light in architectural space, Journal of Architecture, No. 75-74.

Memarian, GH (2005), A survey in theoretical principles, Danesh va Memar, Soroush Publications, Tehran.

Molanaie, Salahuddin and Talebi, Munib (2012), the cultural impact of cyberspace on contemporary architectural space perception Iranian territory, National Conference of Iranian-Islamic architecture and urbanism, Mashhad.

Noghrekar, Abdul Hamid (2008), An Introduction to Islamic identity in architecture and urbanism, Department of Housing and Urban Development, Tehran.

Noghrekar, Abdul Hamid (2010), The theoretical foundations of Architecture, University of Payam Noor.

Omidbakhsh, Mahmoud (2008), Social interaction in virtual communities, Chista, No. 252.

Shoar, M. (2004), Echoing with the Age of Communication, Journal of Computer Architecture and Building, the first issue.

Toffler, Alvin (2001), The Third Wave, translated by Shahindokht Kharazmi, Elm Pub.