

## IMPACT OF ICT ON URBAN DESIGN

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### Abstract:

*Information and communication technology as the main axis of the development of the Third Millennium has been proposed. In this regard, the city due to the transformation of urban space and the emergence of new information technologies and communication infrastructure is changing. The importance of information and communication technology era is far beyond its means (Internet, GPS, etc.) IT technology provides possibility that person be presents simultaneously in both real and the virtual. Therefore nature of urban space environment factors (physical and non-physical) and culture (material and spiritual achievements of a society) depends, will be transformed by new technology. On the other hand, the shape of the city performance, composition and distribution activities has always been extremely impressed with the capabilities of its network infrastructure. Therefore, as industrial revolution led to major changes in its texture, ICT infrastructure has also led to vast changes in the body of the city. According to depth and breadth of these developments, it is essential to understand the new direction of this flow through the physical transformation of the city affected by this new technology. Because what cause current concern about negative effects of new technology, is the result of an unplanned effects that occur in contrast to the virtual space and real space. In this paper by avoiding the issue of subjective attitudes toward information and communication technologies, study impact on the urban space, the body and the face of the city and finally, a new definition of urban design in the age of information and communication technologies is provided.*

### 1. Introduction

We entered to a new technological-cultural field that foundations of our thinking about space and urban space (where we live) challenged. Due to the growing presence of information and communication technologies in everyday life. The facts that people spend more time in front of a computer screen, aware them of the fact that their space is formed within the computer and belongings. Gradually, architecture and urban atmosphere, changed to adapt new activities and to provide Internet access. Technology makes it possible that a person can travel simultaneously in both the real and the permissible. For example, tool that is equipped with wireless internet and GPS technology, in urban atmosphere, where provides space-related technical data and visual and the user can understand beyond the establish scope of their physical space. New technology penetrates thoughts

of user that became as medium of knowledge and experience in living space. And user with information and analysis of the images achieved not very creative and independent knowledge of the environment. So, internet attempts to transform the way we see and understand space." (4) Since our perception of space depends on the presence (Presence). Ditton & Lombord (1997) argued that different technologies, cause different experiences of space. This transformation of the space have also seen in other early writers as Barbatsis (1999), where he says: "Space as a metaphor for our mind, will change whether it be in the realm of non-digital world. So the technology and information technology, with a new attitude and a new life, creating new atmosphere. That resulting conflict between traditional ideas and new technological possibilities of real atmosphere and cyberspace (cyber). a Combined space, that is remembered as Cybernetics (Cybernetic) atmosphere. On the other hand, the possibilities of this new technology, makes new infrastructure, for future town. The infrastructure of the urban environment, while increasing functionality and performance of the new definition, will change the body and the face of the city. In recent decades, urban literature, urban interactions and information technology under titles such as Digital City, Digital city)), the virtual equivalent of a real city (Parallel city) and Recombinant planning) confirms that the combination of ICT and traditional urban planning and management. This paper aims to identify the impact of technology and efficient use of information and communication technologies on urban areas, review physical transformation of the city, the physical transformation of the city, in three dimensions of urban space, urban landscape and body:

In the first part to identify the urban area, changes in information technology era, first with explore the nature of a future urban area (urban area and Cybernetics), pay attention to Comparative analysis of the spatial hierarchy and sequence of traditional and digital. Then transformation of urban spaces (streets and squares) are examined. With regard to the second part of the information technology infrastructure of the new urban, review focus on the impact on the urban body and landscape.

## **2. Section I:**

Transformation of urban space in the era of information technology:

- Cybernetics cyberspace

"The digital space (cyber) proof - the argument space". Mitra "the space of recognition components, by written and visual agreement elements can be possible" (4) cyberspace has no geographical boundaries - political, but that does not mean that there are no limits or boundaries; Constraints and boundaries of cyberspace are such names and passwords which control entire access to the site. Cyber infrastructure is technology; As Steve Jones refers to structure's Info (9). About Differences of cyberspace which oversees through computer **monitor** can be connected with it and real space, with inspiration comparing architecture and cinema, Eisenstein stated in late 1930:

In Monitor impact of conflicting perceptions passing in front of supervisor but in the real city, observer move within the set of phenomena that have been exposed and with his five senses, will understand their mental structure of the system based on the system itself. Heim says: "ideal Virtual reality and cyberspace should have ability to take the user to the real world beyond reality. Consequently, Real space, relegated to the background and visual become important. In summary, we can say:

Cyberspace and real space are two faces of one coin at a substantial disadvantage to the other - with all its consequences. But the city digital space – cyberspacean evolved product is interaction between cyberspace and real space not a Cyber. "The contrast between the real space and cyber space create a new hybrid forms that meet their specific characteristics And we'll remember it as the cybernetic space." (4) Cybernetic space, while realism (real space character) due to lack of limitations and constraints in real space, is more powerful. To Understanding the cybernetic space, system approach is governing and the whole system must be considered together. In this regard our attention to Wiener feedback and ideas on how one component will affect the whole cybernetic space

- **Urban Space Cybernetics:**

"Different approaches to urban space have different emphases, which allowed them to one of the many ways to search multifaceted phenomenon." (17) This paper focuses on the physical urban space and its today evolution. Nature of urban space into two operating environments (physical and non-physical) and culture (material and spiritual achievements of a society) depends both through new technologies evolve. DeCretive "The atmosphere in ways that are often used, are created." Thus creating the infrastructure for IT and digital technology will change new face the city the needs and activities. Based on this definition, it can change the atmosphere of the city: urban space, part of the public open space and the physical space available in the area of social interaction may Cybernetics.

- A comparative study of the spatial hierarchy and sequence of traditional and digital city

Spatial hierarchy includes: 1 - open, semi-closed and closed 2 - public, private and semi-private.

1 - Open and closed area

The interaction between filled and empty spaces (open and closed - mass and space) gives the physical nature of the system. Regardless of the historical moments of the evolution of thought in architecture and urban space is preferable to mass or vice versa (emphasis on conflicting modernist and postmodern space and mass) These two has equal value and only separated to facilitate designing .things in The physical city as open space or a closed space and mass are used, the amount of space available and unavailable as a cybernetic space.

1 - Public space, private and semi-private space

Public and private space in the physical city with Privacy borders and territorial space based on ownership of physical barriers - physical is characterized. But in cyberspace Privacy and territory, any space related to activities and how to access it. in Hierarchy cyberspace access, although following different patterns, but similar hierarchy of physical urban space into three general categories, public and semi-private split. (For example, some sites are private and request proprietary code they enter, some are semi-public with the invitation to enter the code and some are public and available to the public) Sequence space, is based on space-time experience that in both the real and digital urban space- but in two different ways - is understandable. (In the digital space, understand the sequence space through images and impressions are induced by monitor.)

### 3. Types of urban space:

With the changing lifestyle of urban structure, urban areas will be changed in future developments here, "the two basic elements of urban space: Street and Square," Krier checked.

1 - Street:

- New technology eliminates the boundaries between public and private space, so the effects of each of these two spaces can be searched for in other

- Walled city, from state of the current rigid change to permeable and flexible form(10)

- Sign of Urban, paintings and furniture of city transform:

Physical signs of urban cities are added to the system.

Navigation via GPS eventually end with eliminate municipal boards.

Urban furniture is equipped with digital systems.

- According to e-commerce systems shop become smaller

- The urban travel demand reduction and better public transport facilities, streets again - after the Industrial Revolution and the machine age joins within the walk.

Street will be living space, with variable information - in the local community and beyond - will be. (Digital painting Wall Street urban form to create a variety of information and advertising, as well as signs and city are used.)

- Intelligent Traffic Control and Parking

- Increased safety due to continuous digital monitoring

1 – Square

- Due to delete or modify many of today's applications, Changing segmentation of urban and mixed land uses form city strongly as the past, was not bound to the transport network And social functions - symbolic field is preferred.

- Walled city (including square or street) in front from digital images - to inform, promote or changing the views urban

Thus, Field space will be a cybernetic space consists of physical dimensions and cyber that provide the simultaneous presence in different space and time.

- Public spaces of the city imposing visual data - information (Through artistic expression - Digital walled city)

- New Qualities of the space, will affect the aesthetic criteria.

- Space field to meet and benefit from digital equipment becomes. (Environment, social interactions in both local and global - together - occurs.)

<b>Transformation of urban space</b>	<b>Nature of urban space</b>	Part of public open space and the physical space which is available for social interaction place	
	<b>Hierarchy</b>	Open and closed space	<b>Real space: equivalent full and empty space (heap space)</b>
		<b>Cyber space: accessible and inaccessible space</b>	
		Public and private space	<b>Real space: depends on the type of ownership and access.</b>
	.Cyber space: space on the field and how to access		
Sequence space (based on the experience of urban space and time to understand		<b>Real space: track motion in space (time) own by observer but body-spatial is result of designer work.</b>	

	both the real and digital space - but in different ways(		<b>Cyber space: spatial sequence by providing data through monitors is understandable(time is control by designer)</b>
	<b>Types of urban space</b>	<b>field</b>	symbolic field is preferred --Social functions city walled are cover with digital images And field space and a cybernetic space will contribute body and cyber dimension that provide simultaneous presence in different space and time. - Public spaces of the city imposing visual data - information --Qualities of the new space, will affect the aesthetic criteria -Field turned into an atmosphere to meet and get benefit from digital device
		<b>Street</b>	-Fading boundaries between private and public space -Walled city, changed from current rigid state to permeable and flexible form. - Signs of urban citizens, are added to the system GPS navigation through the city to remove the fixed panels - Urban furniture is equipped with digital systems. According to e-commerce systems, shops become smaller. Street - again - after the Industrial Revolution and the machine age-join pedestrian realm -Street is living space, with variable information - in the local community and beyond - Intelligent Traffic Control and Parking - Increase safety due to continuous digital monitoring

**4. Part II: information technology city of New Infrastructure:**

According to the previous network infrastructure - such as water supply networks, railways and ... In shaping the structure and pattern of city texture -And given that this usually introduces a new infrastructure that will fundamentally change the city and its development process, (5)The impact of the new building - High speed digital telecommunication or what Steve Jones it refers to as Infrastructure -will be As Revolutionary impact of old infrastructure.In general,urban infrastructure by 2 ways influence city:

1 - Increase environment ability:Modern urban infrastructure, improve the quality of life, communication, provision of information, enhanced participation, economic development and transformation of urban space.2 - Activities to support: the interface and the body have changed in different historical periods. New communication technology infrastructure in the context of the modern city - with the idea of following up the body from activity,achievedidealldea of the modernism.FutureCity by the revolution that is occurred in the nature and delivery of municipal servicesEmphasizes action, not body.

DoctorJalali is described electronic infrastructure in three parts: (18) 1 - life electronic (e-life): education, entertainment, communication and electronic transactions 2 - the electronic (e-

organization): Trade, Service, System relationship management, enterprise resource planning and e 3 - electronic government (e-governance): governance, management, government and international challenges. Therefore, the texture of urban space and the future will be in order to adapt the functionality of these three areas.

<b>New infrastructure Information ) (Technology</b>	<b>1-Increases environmental capabilities</b>	Communications	
		Information	
		Partnership	
		Economic Development	
		Change in the concept of space and urban space	
		Electronic Life	
	<b>2-support activities</b>	<b>Electronic Life</b>	ELearning
			E Entertainment
			E Communications
			E Transactions
		<b>Electronic Organization</b>	E-commerce
			E Services
			enterprise recourse planning system and relation management
			E-Government
<b>Electronic government</b>	E management		
	EGovernment		
	International challenges		
	International challenges		

Review city Body transformation in an era of information technology:

Here some of the major impacts of information technology on the urban fabric will be offered:

- Reduced daily travel - due to changes in the delivery of municipal services, Combine work and life, modern communication facilities and public transport - that is the role of the transport network fade and the city released somewhat from the shackles of light forwarding
- According to the "close relationship between communication and transportation" (9) and the objectives of sustainable development, the city will implement in the future.
- will see the maximum user incorporation As far as work and living spaces are integrated.
- The great modernist city blocks - of service, administrative, commercial and ... are reduced and overall performance changes due to land use map of the city is changing.
- The field of society-economic of the old city is gradually broken and groundwork to fulfill all the Aspirations of early rationalist early urban engineers will be provided. (Such as gradually reducing the activity of the body, the other would be a good investment.) Implementation of this important revolution in urban planning and urban management are considered.
- Globalization and new infrastructure, urban settlement patterns and affect neighboring units: 1 - Ability to build bungalows isolated individual in nature, equipped with a communication technology, provides. 2 - "Due to Fragmentation and Recombination by the city to build a model of an ideal neighborhood that was damaged in the industrial city, is provided. (5) In fact, the idea of new urbanism neighborhood units, emphasis on pedestrian access with future developments

- Zoning modern city and its problems (lack of coordinated distribution of urban activities in time: Administrative areas, commercial activities at the night lose their lives, increase urban travel. ), Due to the changing pattern of land consolidation, is gradually transformed.

- The access to be challenged in the future:

Pattern of access as a way of controlling access to public space, in both physical and digital urban space is considered to be "one of the most common issues among urban and internet access.(9) Access to the Internet is one of the modern social development indicators. Firmino urban space based on access to the Internet can be divided into three categories: (3)

1 - Non-Plugged: places of modern communications infrastructure are totally bereft.

2 - Adaptive (adapted spaces): Traditional spaces, that transformsto embrace new technology. This adaptation, entirely or partially (mix and match some of the space)

3 - Transformation (transformed space and metamorphosed) are new spaces typically provide access to new technologies and cyberspace are designed as a port of entry. (Physical infrastructure supporting the digital city

Access	In real city	Rate of access to real-space	Public access	Public space
			Relative access	Semi-public-privet space
			Special Access	Privet space
		Rate of access to non-connected cyber space network	<b>non-connected cyber space network</b>	
			Adapted spaces	
			Deformed spaces	
	In digital city	Rate of access to cyberspace (Index communities develop)	Public access	Public spaces
			Relative access	Semi-public-privet space
			Special access	Privet space
		Rate of access to real-space	Grounded cyber space (Grounded )	Limited access (one way): Cyberspace as real space simulation model
				Reciprocal access: the person at a time has access to both Cyberspace and the real presence of the combination of cybernetic space
			No grounded cyber space ( Non Grounded )	Lack of access to regions that do not have access to the Internet and digital devices Input Cyberspace

- The industrial city has a coarse texture. The type of activity and create hybrid of urban users, causes smaller pieces of texture. For example, commercial activities, depending on the level and distribution of goods (The neighborhood, city, regional or national) are concentrated in the state. Selling small goods, high value and perishable like the book is not limited to stores and warehouses and distribution centers (intelligent mail system) are scattered throughout the city. As a result, the level of infrastructure business unit decreases. However, the integration of land uses and management systems and e-services, face to face communication and office space required is also obviously reduce. - The impact of digital network infrastructure is not being centralized and decentralization. But rather a complex process of disintegration and re-composition of the texture (like a chemical reaction that breaks some connections, some new and some are made to maintain (5) However, this new infrastructure to create a compact city - as a strategy for possible sustainable development (20)

Study city Subsequent development in the era of information technology:

Incompatible urban area (Legibility) with the 5 way, edges, nodes, landmarks and neighborhoods are analyzed, with the definitions of these factors will be a major change in the future:

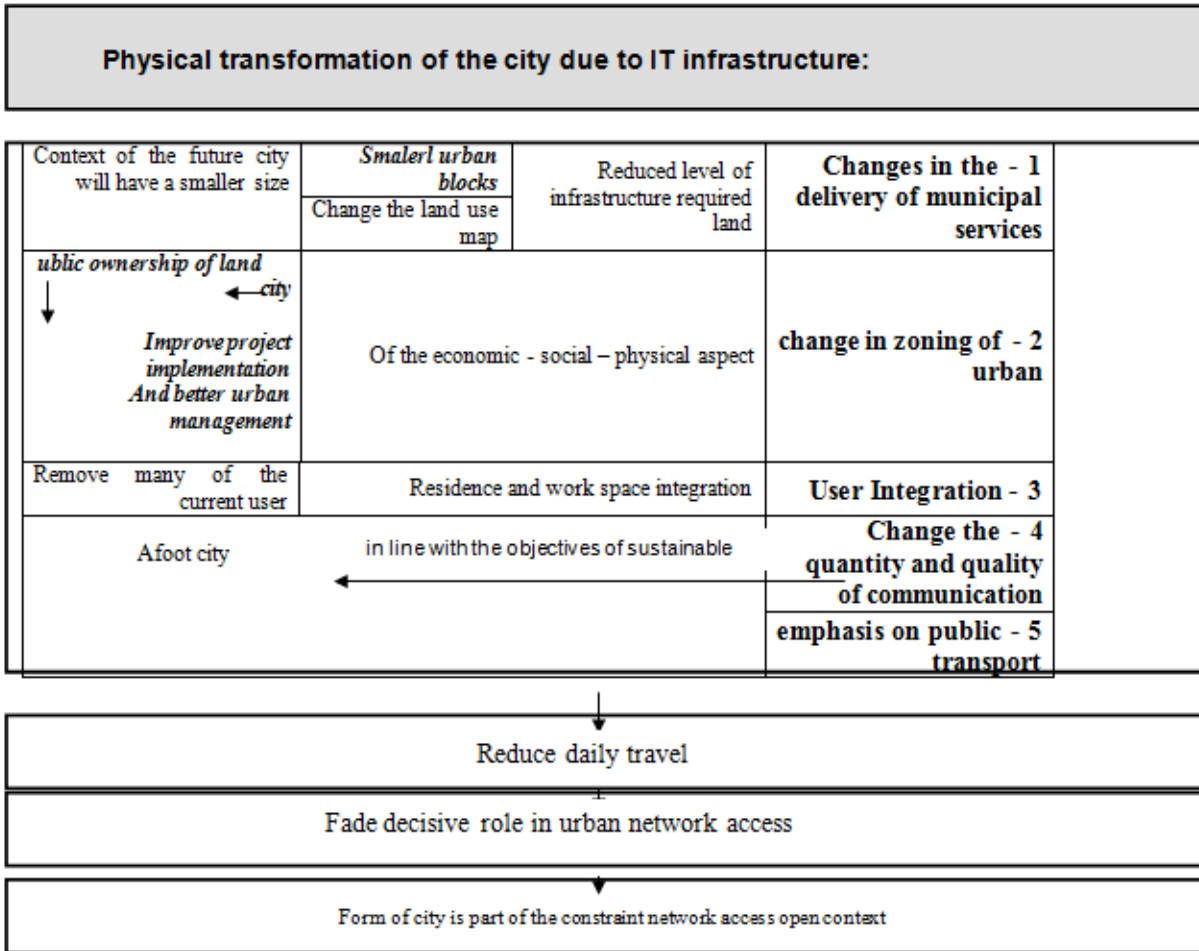
Way: Instead of the word elected "reach" of the meanings of "up" and other means of access to space is elected. Way access physical or process information clearly guarantee justification of future city.

Edge: the boundary of urban neighborhoods and streets disappear and be permeable so that there will be a trace of each space shuttle. The same thing also happens in cyberspace it means there is no clear line to separate the field sites.

Node: centers of attention resulting from current intersection of the access or overlap of activities taking place each space.

Sign: sign of Urban as an agent to facilitate navigation to find the identity of the non-physical scale (digital) Sign is factor that help understands urban space (the spatial relationship and relative). So next dynamic urban space, urban signs came out Rigid and static situation and while the movement direction that the scale of the whole city the own pace with slow-moving.

Neighborhood: The new structure, the neighborhood provides where the social interaction - also come benefit from local connections. Due to the weakening economic factors - class, city of the future (due to the public ownership of land), the possibility of subcultures the same neighborhood unit separated and the promotion of social identity - physical locations are provided. Possibility of strengthen the public transport system - that is one of the sustainable development strategy - a change in the concept of accessibility, the city streets to reduce vehicle traffic and the urban activity, it is practical. Although participation the primary purpose of early digital city (digital city of Amsterdam), but actually lose other initial capability. City digital infrastructure - the "role of computer simulation in particular participatory planning" (7), provides Possibility to create two-way communication and proactive notification - in all phases of project planning and design, people active participation.



**Conclusion:**

With the digital revolution and the role of information technology in real space and digital space to create contrast between the (cyber) spaces, creating a hybrid called cybernetic space - which possesses characteristics of both real and virtual space the future of urban space is transformed. With the concept of urban space - the subject of urban design - the new definition of urban design will be presented as follows: Urban design is the process of organizing a group, interdisciplinary and public space of the city, so as to improve the functional qualities, environmental and aesthetic experience of urban spaces. On the other hand, due to the impact of new information technologies and communication infrastructure, body, the urban landscape, the structure and process of development will transform the city. Hence use of the combination and interaction of the Recombinant Urban Design Urban Design and IT aspects of the proposal that represents incremental try and Recombination of urban spaces and urban city texture through new definitions of cybernetics and digital communications infrastructure.

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