DISCUSSIONS CONCERNING THE IMPACT OF THE DIGITAL REVOLUTION ON THE ENVIRONMENT
Will Planners Cope?

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Abstract:
Technology has always affected the development of cities; it is a fundamental instrument that humans could use either for the benefit of the environment to help them reach utopia or for its damage and fall into pure pandemonium. The paper seeks an understanding of the new life-style resulting from the impact of the digital revolution on the environment and the way in which such new life-style would be reflected on spatial development.

The new vocabulary and terminology in-use will be first introduced. Consequently, the paper will identify the accelerating speed of changes resulting from the digital revolution on people's life-style and perception of the environment. In addition, the paper will explore the ways the built environment has to be adapted to this new life-style and demands, to be able to adapt better to the world wide changes which planners and architects are going to be confronted with. Finally, the paper will shed light on the predictions tackled by futurists in dealing with the digital revolution with reference to the new life-style.

Key words: globalization, space of flows, digital technology, digital devices, telecommunications, information society, polarization, information and communication technology (ICT).

1. Introduction:

It has been thought, through the last century, that planners and politicians could control land use and could guide economic development by the planning and design of areas for distinctly different types of activities, where the separation of activities into functional zones was an essential planning process. Such century was characterised by zoning regulations that govern most cities and suburbs. Moreover and by the invention of transportation facilities, the availability of locating industrial areas far from residential communities took place.

The present, on the other hand, is characterised by the digital revolution which is recognised by the accelerating speed of time. The invention of the television represented the first form of large scale on-line distribution of information. It introduced the global culture at home, thus changing inhabitants' life style and their environment. The invention of computers and then their connection to networks and further to cellular phones digitalised the society where man lives, and so changing the present and future. The term digital through the paper refers to the computerised and tele-mediated communications exchanges and transactions, which is based on digital principals (based on the streams of zeros and ones) and thus dominating most aspects of the present urban life. It refers to information, communication, and computerised technology.

2. Problem:

The digital revolution is usually looked upon as a consequence of the industrial revolution. Accordingly, any research dealing with the former should not omit the latter.

Architecture and planning pioneers, as Ebenezer Howard, Le Corbusier and Wright, have invested far more resources to study the influence of the industrial revolution on urban development. Despite the fact that the industrial revolution has fulfilled most of the research, on the contrary the digital revolution is still awaiting for sever investigation to pin point its effect on the urban form of cities. In dealing with such, few urban futurists focus their studies and predictions on the digital revolution and moreover, they view information technologies as the fundamental instrument of the new organisation logic transforming the world today.

The accelerating speed of changes and progress of telecommunications throws up many essential and interrelated questions, which go to the heart of the current arguments about urban life within the present and the future. For example, how individuals will be adapted to the new life-style driven by the digital revolution? How are cities affected by the digital developments? Are planners coping with the changes of the urban life?

The research is to discuss the issues aroused by the digital revolution in the urban and planning field through identifying the used terminologies in the field resulted from the digital revolution. The impact of both, the industrial and digital revolution, on people's lifestyle and their environment will be addressed through identifying both utopians and futurists' approaches. Predictions of the future of the urban form tackled by futurists will be further acknowledged.

3. Vocabulary and terminologies used with reference to the urban context:

The digital revolution has raised new vocabulary and terminologies which are used by urban planners. Some of these terminologies will be regarded as follows:

Telecommunications: technologies that allow communication over distance, (Graham and Marvin (1996)).

Telematics: are services and infrastructures which link computer and digital media equipment over telecommunications links. Telematics are providing the technological foundations for rapid annotation in computer networking and voice, data, image and video communications. It is increasingly obvious that telematics are being applied across all the social and economic sectors and functions that combine to make up contemporary cities, (Graham and Marvin (1996)).

Globalization: technological revolution offers an infrastructure for exchange of information that must be considered the basic condition of globalization. Information and communication technology (ICT) is the driving force behind globalization. Globalization affects society in all its aspects, the economy, culture and social life of inhabitants. Through globalization distance and time are shortened to a cyberspace and cyber time. Everything is bridged and physical boundaries no longer have a meaning. As a result of globalization, internationalization existed in different cultures and its impact on the built environment is formed by central business districts with skyscrapers, waterfronts and suburbs.

Space of flows: people, goods and information not only move in a space of place but more in a space of flows. The system of exchanges of information, capital and power that structures the basic processes of societies, economies and states between different localities, regardless of localisation. Castells (1993) calls it space because it does have a spatial materiality: the directional centres located in a few selected areas of a few selected localities; the telecommunication system, dependent upon telecommunication facilities and services that are unevenly distributed in the space, thus marking a telecommunicated space; the advanced transportation system that makes such nodal points dependent on major airline services, freeway systems, etc. The space of flows, superseding the space of places, epitomizes the increasing differentiation between power and experience and the separation between meaning and function.

Informational City: is the urban expression of the whole matrix of determinations of the Informational Society, as the Industrial City was the spatial expression of the Industrial Society. The informational city is at the same time the global city as it articulates the directional functions of the global

economy in a network of decision-making and information processing centres. Such globalisation of urban forms and processes goes beyond the functional and the political to influence consumption patterns, lifestyles and formal symbolism. Moreover, the informational city is also the dual city because the informational economy has a structure tendency to generate a polarised occupational structure, according to the informational capabilities of different social groups. The informational city is determined by the pre-eminence of the space of flows over the space of places, (Castells, (1993)).

Information district: an urban milieu that sustains economic growth in new cultural and symbolic industries, where information face-to-face contact is essential, whilst also providing high capacity on-line linkages to the wider world. In such districts micro and small firms are concentrated based on digital art and design, web production and digital and multimedia services, (Graham and Marvin (1999)).

Tele villages: an integrated urban place supported by a whole suite of ICT infrastructures and services, (Graham and Marvin (1999)).

4. The accelerating speed of changes on people's life style and perception:
Changes that resulted from big inventions have their strong impact on both, people's life style and perception and so their environment, thus it has been always difficult to foresee. The pre-industrial era was characterised by protected spaces arranged and designed with great care. Walled and protected, the city was a place for reproduction of the societal order and as a place for public communication. Culture identity of the city and its inhabitants was a normal reflection of the cocooning characteristics of that time.

The emergence of the industrial revolution has changed the concept of the city. The city walls were broken and immigration from the country-side to the capital took place enormously. The ever-growing speed up of the transportation shortened long-distances through the inventions of automobiles, aeroplanes and other transportation devices hence encouraging social connection between distant occupants. Whole building blocks and skyscrapers replaced family-houses, parkways replaced streets and parks replaced gardens. Alternatively, the negative impact of the industrial revolution on people's life is the other side of the same coin. Classification of social classes appeared; people who could afford having the technology of the time were segregated from who can't afford. The appearance of cars in streets widened the distances between residents and so made it more difficult for face-to face contact. The existence of cars jeopardised pedestrians' safety.

Furthermore, the digital revolution has affected inhabitants' life-style remarkably. In terms of social behaviour, interaction between individuals is taking place via the internet through cyber-space. Tele-shopping is now part of the shopping behavior. Because of telecommunication, home-based work became a new phenomenon. It ended up that the digital revolution became the backbone of the changes in the social structure, (Castells, (1993)). In sum the information age has affected, so far, various aspects of human life and society, which will be addressed through the following:

4.1 Economical changes between societies and individuals:

The digital revolution made the economies increasingly internationally connected. Production factors, information knowledge and capital are available world-wide. Castells (1993), states that the digital revolution provides the basic infrastructure for the formation of a functionally interrelated world system, and it becomes a vital factor in competitiveness and productivity for countries throughout the world. It is an essential component of the new social structure that characterises our world: the informational society. According to Friedrich and Schaafsma (1999), "now in the rapidly growing market every connection to the net has huge financial value and production of information is rated extremely high. The sources of wealth and power are in the ability of a society to perform in information technology". Hall (1997) supports the above statement as he declares that cities' competitiveness in the global economy "depends on their capacity to generate, process and exchange information". Competition between societies is no longer focusing on the quality of productions but more on the speed with which societies respond to new developments. Individuals' life style has changed, especially priorities for their economic payment. Buying digital devices as mobiles and lap-tops is now a necessity to be on-line. On the other hand this asks for periodical replacement as a result of devices' improvement. Moreover the continuous demand of payment for the service itself, as high speed telephone lines, satellite, cellular, and internet represents another economic burden on the family income.

4.2 Segregation between and within societies:

The digital revolution has presented a society characterised by polarisation. A wide gap existed between people on-line and others off-line, between who can afford such technology and who can't. Graham and Marvin (1996) declare that, "While affluent and elite groups are beginning to orient themselves to the internet and home informatics and telematics systems, other groups are excluded by price, lack of skills or threaten to be exploited at home by such new technologies". One exception of this disparity is the use of mobile phones. Mobile phones are significantly used in areas where the existence of telephone cables is considered a luxury; they are easily used by people who have difficulties in reading and writing as a replacement for communications via the

internet. In comparing mobile phones to internet, the former are used more in developing countries than the developed one. According to Townsend, (2000) "…cell phones are now appearing widely in the squatter communities that surround many third world cities, places where conventional wired phones have never existed". Consequently, there will be a noticed difference between well connected, developed countries and underdeveloped or developing countries. Graham and Marvin (1996) stress on social segregation resulted from the digital revolution, they state that "advanced telecommunications and transport networks open up the world to be experienced as a single global system for some. But others remain physically trapped in 'information ghettos' where the basic telephone connection is far from a universal luxury", (see also Castells, (1993)).

4.3 Changes in people's perception of the environment:

Digital devices as mobile technologies provide information about navigation, opportunities, etc. to urban environments and thus they will act as mediators between users and environments. Hence they will have an important influence on the imageability of cities. Globalization is affecting people's perception of space and their image of the world. According to Graham and Marvin (1996) "there is little doubt that the human experience of space and the social construction of cultural identities of groups and individuals are being radically altered in these 'global times'. This is because new advanced telecommunications act as conduits for flows of images, knowledge, information and symbols which integrate places and people into the global cultural system in 'real-time'. Thus, traditional national mass broadcasting systems are giving way to a broadening range of global systems of mass communications (such as electronic mail and the World Wide Web on the Internet). Through these systems a growing proportion of social interaction and cultural flow take place". In sum, globalization and the information society make people aware of a loss of meaning in space.

5. The new life-style's effect on the urban environment:

The change in the built environment was not a result of the moment, it has been growing starting from the industrial revolution, but the change accelerated in the relatively recent years of progress due to the emergence of digital technology. The effect of both revolutions on the environment will be declared through the following:

5.1 Industrial revolution and the environment:

The impact of the industrial revolution on the urban environment went through a lot of attempts, investigation, discussions and predictions. Some of such attempts are Ebenezer Howard's Garden City, Le Corbusier's Contemporary City and Frank Lloyd Wright's model of the Broad-acre City. All could be classified under utopian visions to deal with the industrial

revolution in terms of planning the city. It was not just the fascination with the power of technology which they hoped would lead industrial society to a just ideal form, but more to over come its negative impact on people and their environment.

Ebenezer Howard's "Garden City" (1898) plan is far and away the most important attempt, both as a unified vision addressing the full range of urban development issues and as an originator, moreover as it is considered a method of modern urban planning as a profession and a body of theory. As an attempt to solve most of the industrial revolution's disadvantages, the city itself would feature a complete array of municipal services and amenities through the construction of parks, public gardens, tree-lined boulevards, hospitals and asylums and enclosed, centrally-located crystal palace style emporium. The zoning idea of different uses, amalgamation of nature within the city, and the development of self contained "new town" communities outside crowded central cities were the base for the entire tradition of modern city planning. Fully planned communities were actually built after Howard's plan, in the design of the word's first garden city of Letchworth and then Welwyn in Britain.

In 1922 Le Corbusier proposed "A Contemporary City for Three Million People". Laid out in a rigid symmetrical grid pattern, the city consisted of neatly spaced rows of identical, strictly geometrical skyscrapers. This was a breath-taking, totally modern vision of space and skyscrapers evenly spaced in a park. Despite the outrage he was faced by, today the skyscraper in the park is one of the model and ubiquitous realities of modern cities everywhere. Le Corbusier has truly transformed the global urban environment through high-rise blocks that have been built in cities world wide. Brasilia and Chandigarh, India are relatively complete examples for Le Corbusier's ideas. Le Corbusier's style has truly become the International Style of our time.

Opposite to Le Corbusier, Frank Lloyd Wright promoted a naturalistic architectural style, as well as a vision of urbanism through his announcement of the disappearing city (1932). Wright's "Broadacre City" was with no large urban concentrations. His new community wiped out time and space as it was more emphasised on the industrial inventions of that time; transportation (automobile) and telecommunication (telephone). His introduction of independent homesteads in which people would be isolated enough from one another to insure family stability but connected through such devices was predictive of a new urban/suburban reality that could dominate the planning of the future.

Moreover and related to Le Corbusier's idea of "machine age", Soleri introduced what he called arcology. As an architect and an environmentalist

Paolo Soleri was more directed and concerned by the ecological system and the effect of the industrial revolution and the technology, of that time, on such system. According to Soleri (1969): "In a society where production is a successful and physical gigantic fact, the coordination and congruence of information, communication, transportation, distribution and transference are the mechanics by which that society operates. It is not accidental that these are also dynamic aspects of another phenomenon, the most dynamic of all: life" He found a solution in what he called arcology which is a combination of architecture and ecology. Soleri proposes constructing giant mega structures, each containing population of millions and leaving the rest of the planet to wilderness.

In another attempt to overcome the ill problems of automobiles and how urban form could be adapted to such problems, Clarence Stein and Henry Wright planned Radburn (1929). They invented a series of planning concepts including super-blocks, the separation between pedestrian and traffic arteries and separate city areas with strong neighbourhood identity. Houses turned away from the street to face a sense of parks forming the backbone of the community. The plan of Radburn, New Jersey, has inspired generations of planners through copying what they called the "Radburn Idea".

In the sixties Webber (1969), one of the utopian visionaries, early predicted that certain technological developments (industrial technology such as air travel, telephone and trains) will result in an end of traditional cities and the emergence of post-urban period of human development. Moreover he revealed that technological improvements in transportation and communication reduce the friction of space and thereby ease long-distance communication and have loosed a chain of effects taking from the city its once unique function as an urbanising instrument of society.

The above and others were utopians' attempts to overcome the problems of the industrial revolution and to foresee its impact, at that time, on the city of tomorrow. Urban planning as a profession became essential in the life of cities. Segregation of use, transport systems, land use planning, etc. became the main theme of planning. Meanwhile the emergence of the digital revolution and its impact on people's life style has produced a new perspective for urban planning.

5.2 The digital revolution and the environment:
According to Moss and Townsend (2000), "New telecommunications systems are doing far more than rearrange the spatial pattern of activities. They are redefining the fundamental elements of modern urban society- the office, the automobile, the home and the street- and generating a need for a new conceptual framework to understand the way in which telecommunications system are

influencing the character of activities in cities and metropolitan regions". The digital revolution mostly affected the physical environment through the following:

5.2.1. Urban form:

The sprouting of new telecommunications equipment is radically reshaping the urban landscape and physical urban forms of cities. Suburban office complexes, business and technology parks, out of town shopping malls are transforming the fabric of the city. Moreover, the deconcentration of many cities and the appearance of the multi-centred urban area have been, at least in part, facilitated by the new qualifications of telecommunications and telematics for supporting distributed economic activities away from urban core. Core cities are being turned into extended urban regions. The formation of "information districts" and "tele-villages" emerged in the urban form of many cities, as New York's' Silicon Valley, Dublin's Temple Bar, Manchester's Northern Quarter, The Technological Park of Athens is under construction and the idea of The Smart Villages in Giza, Mansoura, Alexandria and Assiout all in Egypt. Moreover, and as a reflection to the wide social gap raised within societies, the concept of fenced communities is also part of the new urban form, i.e. Quatamia Heights, Mirage City and Dream Land by the outskirts of Egypt.

5.2.3. Land use:

The new digitalized life-style is changing the land use patterns, location and zoning of areas and communities within cities. Currently, land use planning and development control are increasingly seen as a form of regulatory activity through which urban form can be influenced, (Allmendinger (1999)). Office and work are changing through home-based work relation via telecommunication, the use of educational institutions will have another scope after inhabitants' use of open universities and teleconferences, shopping via the internet will affect the economy of cities and face-to-face interaction is expected to be replaced by internet and video phones. Social interaction in public spaces is highly expected to be mediated by social interaction via telematics. As Moss and Townsend (2000) declare, "Public spaces in many cities, once venue for strolling, begging or flirting are now primarily used as a place to talk on mobile phones". Recreational behavior is changed and a diverse of interests is noticed, where participants seek cyber-games relatively replacing board and electronic ones. In addition, cyber cafés and amusement parks are expected to oust cafeterias, coffee houses and funfairs thus affecting land use, (Abou El Ela (2001)).

5.2.4. Infrastructure:

In terms of infrastructure, telecommunications help in the accuracy and effectiveness of controlling and identifying the costs of servicing different types

of customers. New information and telematics technologies are helping to create new markets in infrastructure services, introducing competition onto networks, distinguishing between particular types of customers and presenting a wide range of value added services.

5.2.5. Transportation:

A close linkage between technologies and transportation has been noticed through history. Telecommunications can help to stimulate more accessible forms of communication, and generate new demands for the physical movement of people and goods as shopping via internet. Moreover, new technological services as road information systems can help drivers to overcome the uncertainties of traffic congestion which again improves the use of road network. The Intelligent Transport System (ITS) technology furthers the safety efforts on the road as they are centrally controlled in an integrated manner. On the other hand, and due to shopping, delivering and socialising via internet, the flow of people is expected to decrease. In the time being, no sign of reduction is perceived. On the contrary, the flow seems to keep on growing. It ended up that the digital revolution has added a different type of travel, to different places, for different reasons and at different times.

5.2.6. Architecture:

Architecture is as much about activities taking place in spaces as about the spaces themselves. The growing use of telecommunications systems is changing the character of activities that occur not only outdoors but also indoors, thus affecting the field of architecture. They are changing and transforming every day urban life and reshaping the use of the built environment. Mobile phones, as an example of telecommunicating devices, is becoming more and more important in people's life, they are more reliable on such devices. People who arrive separate locate each other via cellular phones, thus changing the use of spaces as waiting rooms and collecting areas. The telecommunication systems are not only rearranging the spatial pattern of activities but more they are redefining the fundamental elements of modern architecture (home, office, etc), therefore asking for a new design of indoor spaces. Information systems are permitting new combinations of people, equipment and places, in addition to the mix of various-oriented activities within the same space. In terms of home's design, it's no longer a site for social-emotional functions of the family, plainly designed as a shelter from the work place. Information brought into the home through a number of technological devices (computer, internet, satellite dishes, high speed phones, etc.) has dramatically expanded the number and type of activities that can occur within the residence. Furthermore, telecommunications affected the workplace. Firms such as IBM have reduced the size of the individual office and rely on flexible office assignments as "hot-desking", but there is simultaneously a greater emphasis on the use of conference rooms and

centres for encouraging interaction and team work, (Moss and Townsend (2000)).

As Graham and Marvin (1999), stated that the effects of telecommunications on cities seem to be far more ambiguous and complex than many would have us believe. Mitchel (1999), sums up the effect of the digital revolution on urban life: "In the twenty-first century, then, we can ground the condition of civilized urbanity less upon the accumulation of things and more upon the flow of information, less upon geographic centrality and more upon electronic connectivity, less upon expanding consumption of scarce resources and more upon intelligent management". On the other hand, the digital revolution is facilitating the process of planning through the use of different design techniques based on digital technology and information systems as the use of geographic information system (GIS). In the past, the changes were more related to the physical planning of towns but at present they are more related to life style. In conclusion, the effects of the digital revolution on the living environment are still uncertain due to the accelerating speed of development, accelerating speed of time, flow of information and spaces of flows. The above results restless, stressed individuals and society. The changes in life style which consequently affected the environment as mentioned above, motivated futurists and researches who are interested in the digital revolution's affect on cities to emphasize a number of predictions.

6. Predictions for the future:

Because the effect of the digital revolution on the urban form is relatively recent, much of the writing about impacts of technology on the urban environment tends to be futuristic and provisional. Utopianists and futurists prophesy telecommunications as the fast recovery to problems resulted from the industrial revolution. On the other hand, anti-utopians visualise an increasingly polarised and depressing urban era controlled by global companies who shape telematics and the new urban forces in their own image. In doing so, a number of predictions are raised and will be declared through the following:

6.1 Will it be the dissolution of cities?

Futurists argue that the growth of electronic spaces will lead to the dissolution of cities. As a futurist George Gilder (1995) argues that as a result of the continued accelerating speed of the growth of personal computers, mobile phones and other telecommunication devices, "cities are leftover baggage from the industrial era" and that, "we are headed for the death of cities". Cities are meant to be places were inhabitants fulfil their various needs whether social, psychological or physical but due to the new life style discussed above, cities are diverting their roles. As a respond to the previous statement, according to Moss and Townsend (2000), Kolko has suggested that telecommunication has led to

"the death of distance, but not to the death of cities". The death of distance stated by Kolko is a result of the demolishing of both geographical distances and paces of time. Both arguments are true, which according raised the above question; will it be the dissolution of cities?

6.2 Will it be decentralisation?

Gordon and Richardson (1997) predict that the city of the future will be anything but compact as technology will eliminate the need for cities as centres of interaction. This is more understood as globalisation removed the limitation of geography. Decentralisation is mainly driven by the combined decentralising power of automobiles and telematics. Short distances and concentration is no longer seen necessary. Besides, the change in land use and urban form, stated above, support such prediction. Arguments that the digital technology means the dissolution of the cities and emergence of decentralised networks are widespread by futurists. According to Hall, (1997) "the urban world and the 1990's … is a world in which cities deconcentrate and spread to become complex systems of cities linked together by flows of people and information". Such statement recalls the idea of Wright's Broad-acre City, which was supported by Fishman (1987) who saw in Wright's decentralisation the answer to all questions.

6.3 will people's use of, and attachment to, the urban space remain the same?

According to Graham and Marvin (1996), the transformation from the industrial city to the informational city is creating a global sense of place which affects all previous ideas concerning inhabitants living in regions, nations or cities. Such an effect does not in fact change people's attachment to urban spaces, despite the change in the way of use through real-time. According to them, "cities as places still matter and will continue. Urban places remain the unique arenas which bring together the webs of relations and 'externalities' that sustain global capitalism. They are of fundamental importance as the terrain for social and cultural life; and they seem likely to remain the key economic, social, physical, cultural and political concentrations of advanced capitalist society". They further announce that the city is an amalgam of urban spaces and electronic spaces where both can be seen to influence and shape each other thus defining the future of cities. This statement raised the argument that despite the death of distance, the decentralization of cities and the death of cities, people still need cities to fulfill their demands although such demands may differ than that of the past.

7. Conclusion: In touch with the future:

The present is a phase of time where the world is transforming from an industrial, manufacturing-dominated society to one dominated by

telecommunication, information and digitalisation. It could be because of the phase of history of the industrial revolution that various attempts and predictions took place regarding such revolution. On the contrary, the reflection of research in terms of digital revolution is still blurred. The response to advances resulted from the industrial revolution was more evident on the physical environment which consequently affected the urban life and life style of inhabitants. Meanwhile, the digital revolution's effect is more evident on the life style of people hence affecting the physical environment.

At present urban life seems more easily operated and speeded up but more hesitant and confusing than before. Digital devices have certainly facilitated for residents of different places to interact and exchange information but at the same time they also brought different places in a common territory where differences matter. New life styles and behaviours are introduced to different societies either replacing or accompanying old ones. An accelerating polarisation between and within societies is replacing the relative harmony between social classes thus, forming information global societies vs. information ghettos. Perception of space, through the use of digital mediators, replaced the one formed by their personal experiences resulted from their direct contact to the physical environment. On the other hand, digital devices helped in the understanding of other cultures; through the global contact between different people inhabiting different cities where physical boundaries demolished.

The above changes in life-style consequently affected the environment. Congestion in transportation increased as different activities and deliveries took place accompanying the old ones. The wide gap between inhabitants using technology and other who are not capable of using it created new concepts as defensible gated communities. Societies seeking technology introduced information districts or/and tele villages within their urban form. On the other hand, the field of transportation and infrastructure benefited from the use of ICT in various fields.

As a reflection of the above stated changes, planners should be aware that the appearance of the city and the procedures of planning might still be the same but the meanings, perception and use of spaces and buildings is changing and new city functions is formed. Urban planners need to scrutinise the relationships between the urban environment and telecommunications in more details, paying great attention to the diverse changes that make up the urban reforming process. They should seek to moderate the effect of those changes on the society. They should be aware of time and the high dynamics of changes taking place. Because of the speed of changes taking place, urbanism is too complex to predict, which partially twisted planners' role from proactive to reactive. Accordingly, planners should be cautious of the new information technology if

they want to reclaim their previous role in the making of cities as proactive members.

The effect of the digital revolution on urban and regional growth still needs further exploration. Open questions are still open: can planners still plan cities as meaningful cultural phenomena when globalization is taking over and telecommunication is becoming increasingly high? Will it be possible for planners to cope up with the rapid pace of changes? Should planners deal with the future and predict the coming life style instead of dealing with the present which will expire by the time they reach a solution to its illness? Will Change be the only constant thing inherited in the urban life?

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مناقشات حول تأثير الثورة الرقمية على البيئة

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الملخص:

كان وسيظل للتقدم التكنولوجي تأثيرا كبيرا على نمو وتطور المدن. فهو أداة أساسية قد يستخدمها الانسان لتحسين بيئته الحضرية وصولاً للمدينة الفاضلة أو يستخدمها أداة لتدمير البشرية وهلاكها.

والهدف من هذه الورقة البحثية تفهم متغيرات اسلوب الحياة الحديثة الناجمة عن الثورة الرقمية وما يتبع ذلك من تأثير على البيئة العمرانية.

وتبدأ الورقة بتناول المفاهيم والمصطلحات المستخدمة. ثم تتطرق الى المتغيرات السريعة الناجمة عن الثورة الرقمية وتأثيرها على اسلوب حياة الأشخاص ومفاهيمهم. كما تتعرض الورقة البحثية الى تأثير الثورة الرقمية على البيئة العمرانية بما يتلاءم مع اسلوب الحياة الحديث ويلبي الاحتياجات الناجمة والمتغيرات العالمية التي يواجهها المعماريون والمخططون. وتنتهي الورقة بالقاء الضوء على توقعات مخططي المستقبل للبيئة العمرانية والمدينة المستقبلية في ظل ما يحدث من تطورات في مجال التكنولوجيا الرقمية.

Within the various attempts to deal with the industrial revolution, the garden city of Howard is a very evident one. Using the advanced available technology of its time, Le Corbusier's contemporary city was an example for the use of steel and concrete in the construction of skyscrapers within a park. On the other hand, the decentralisation of the Broad-acre city of Wright totally depended on transportation via automobile and communication via telephones. The Radburn idea of Stein and Wright, which was later used by planners, depended mainly on the separation and segregation of traffic, through the hierarchy of vehicle roads and separation of pedestrians. In sum, the response to advances resulted from the industrial revolution was more evident on the physical environment which consequently affected the urban life and life style of inhabitants.

On the other hand, the digital revolution's effect is more evident on the life style of people hence affecting the physical environment. At present urban life seems more easily operated and speeded up but more hesitant and confusing than before. Digital devices and telecommunications have certainly facilitated for residents of different places to interact and exchange information but at the same time they also brought different places in a common territory where differences matter. New life styles and behaviours are introduced to different societies either replacing or accompanying old ones. Evident polarisation between and within societies took place replacing the relative harmony and limited gap between social classes thus forming information global societies vs. Information ghettos. Perception of space through the use of digital mediators replaced the one formed by their personal experiences resulted from their direct contact to the physical environment. On the other hand, digital devices helped in the understanding of other cultures; through the global contact between different people inhabiting different cities where physical boundaries demolished.

The digital revolution has produced a situation where the source of wealth and power are in the ability of a society to perform in information technology. The appearance of the city and the procedures of planning might be still the same but the meanings, perception and use of spaces and buildings will change and new city functions will be formed. The following are concluded and should be taken into consideration to comprehend the future and to live in the present through a sustainable urban form:

1. The field in urban planning that benefited the most from ICT is the field of transportation and infrastructure. Furthermore, telecommunications advances pose a serious challenge to the urban study.
2. Societies should pay more attention to applying technologies in various sectors of the urban planning process, telecommunications can help overcome isolation, disadvantage and disability, as well as furthering the degree to which the 'information poor' are bordered and developed to overcome the social conflict and struggle between unevenly equipped

groups. New telematics service which promise a global playground to the affluent elites who are 'switched into' telematics systems and whose lives are saturated with technologies should be well thought-out to over come the rising polarise effect between and within societies.

3. Urban planners need to scrutinise the relationships between the urban environment and telecommunications in more details, paying great attention to the social, economic, environmental and geographical changes that make up the urban reforming process.

4. Planners should be well equipped to work in two spaces; the real space and the digital or virtual space. They should be alert to time and the high dynamics of change taking place. Because of the speed of changes taking place, urbanism is to complex to predict its end, which partially twisted planners' role from proactive to reactive.

5. The effect of the technological revolution on urban and regional growth still needs a lot of exploration and investigations. It could be said that people shape technology, and by time it shapes their life style and environment.

6. Open questions are still open: can planners still plan cities as meaningful cultural phenomena when multi-media take over and communication becomes increasingly high? Will planners accept their new role as reactive and not proactive? Will Change be the only constant thing inherited in the urban life?