

Para-side paradigm shifts in urban environments

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Abstract:

Today information and knowledge base technologies have changed many features of our daily lives, but still the information revolution is more about the computers rather than people. We are at the beginning of a new era of computing and information paradigms which can change our lives dramatically (Mattern,2001). While the personal computers, Internet and World Wide Web have already changed many aspects of business, entertainment and science; the next wave of technological revolution is emerging in smart tools and spaces. Smart spaces make our future urban environments more environmental responsive and self organized, in which intelligent tools change our urban behaviour. The result is emerging a new urban and architecture agenda, based on information and knowledgebase revolution.

From a focus on the process of shaping the information society this article deals with the issue of how changing of tools and paradigms change the shape of our built environment in future? In nutshell, this article aims to study the evolution of urban tissues according to information and knowledge base paradigms.

Key words:

Paradigm shift, information technology, built environments, smart tools, people behaviour and urban agenda.

Introduction:

Much has been published according to technological development of computing and connections, globalization and digital networks in built environments. What this report seeking, is the effect of such shifts to smart and invisible computers and software which will effluence both tool and material in built environments. This study addresses the issue of how Information and Knowledge Revolution added new aspect to the built environment and the new built environment changes both our expectation and behaviour. The starting point is information and knowledge revolution, the technology paradigm and how new network society emerges. Then we focus on main

characters of network society, the new urban spaces, paradigm shifts in built environment and emerging of high integrated spaces as a result of such a shift.

Urban revolution and paradigm shifts:

Through out the history of urban growth three significant revolutions, Agriculture (4000 B.C.), Industrial (18th century) and Knowledge & Information (20th century), formed new ways of relationship between people, production and environment.¹ *About seven thousand years ago the Agricultural Revolution shifted colonized communities to city-states settlements at the mouth of three rivers – the Tigris and Euphrates in the Mesopotamia and the Nile in the Egypt (Bellan, 1971:4).* While the banks of the rivers were places of more food production rather than the agriculturalists required, the arterial thoroughfare of rivers provided the main transport ability of the foods. Meanwhile their communications indirectly provided further supports of urbanization: wealth excited the envoy of tribes elsewhere and defence arrangement and urban type facilities such as walls and weapon making established (Bellan, 1971).

Till the onset of Industrial Revolution, although both technology and transportation developed, but by no means was the employed power still only that of wind, falling water, human bodies and quadrupeds. The most significant developments that made the Industrial Revolution truly revolutionary were the applications in manufacturing process, productivity increases and transportation, which have been associated with the power of steam engine and electricity (Bellan, 1971, David, 1991). *After industrial revolution several adaptive forces in society, directly or indirectly, influenced the life and shape of urban areas: these are demographic, economic, technological and cultural forces (Chapman, 1996:10).* These forces caused the societies became more dependant for their livelihood, resources and power on the connectivity of their main activities to networks transcending the limits of their locality (La Bianca, 2000). While some of the forces were paradigm like the technology, the others were “forests of paradigms”, like culture, which are collection of many. The interrelationship of all these paradigms is crucial to the success and longevity of any culture, captured in the word “forest”- a highly interdependent structure (Joel Barker, 1993, Castells, 2002).²

¹ Agriculture Revolution formed a new relationship between people and agricultural production sites, Industrial Revolution between people and machines and Information Revolution between people and built environments.

² Emerging of the Paradigm by its own is a conceptual pattern; a set of rules and regulations (written or unwritten) that establishes or defines the boundaries and tells you how to behave inside the boundaries in order to be successful (Joel Arthur Barker-1993). A paradigm shift, then, is a change to a new set of rules. It is behind much of the society turbulences during the last thirty years. We have set of rules and then they

In the 1940s and 50s the transformation of information and communication technologies were unleashed based on the microelectronics revolution. It constituted the foundation of a new technological paradigm, consolidated in the 1970s, mainly in the United States, and rapidly diffused throughout the world, what Castells has characterized descriptively, as the information age (Castells, 2002). All the urban revolutions changed the ways of production, communication and transportation. Unlike the previous revolutions, the Information and Knowledge Revolution expanded from personal tools (mostly personal computers) which shaped the whole network of information society. Here the physical aspects are slower to change than communication and management aspects. Each technological paradigm organizes a series of technological discoveries around a nucleus and a system of relationships that has been shaped based on virtual rather than physical networks. Information is a technological paradigm based of the augmentation of the human capacity, activity, organization of information processing and communication (Colas, 1992). It has been possible by revolutionary change in the material conditions of their performance, microelectronics, software and genetic engineering, which are mostly virtual communications and networks. These virtual communications and information networks add a new aspect to built environment and enable these spaces to act as smart environments in response to local and global changes.

The shift of built environments to information based units not only will change our expectation from our environment but also will make new social behaviour appeared. Such a system expands and sets the standards of performance in different synergies in society like the socio-cultural, information and economical paradigms. Unlike the current situation which ordinary people left perpetually upgrading hardware to meet the demands of new software, or trying to understand why they cannot connect to the network, the ideal system is to bury the technology that the user is not even aware of its presence, the goal is to let people get on with their activities, technology enhancing of their productivity, power and enjoyment over the more so because it is invisible and out of sight (Norman,1998, Gershenfeld,1999).While the information revolution is an incomplete story we can see the real revolution so far has been for the computers not the people.

change, so we understand the old boundaries then we have to learn new boundaries. These paradigm changes are especially important in built environments because , whether they are in economy, politics, technology , a paradigm change, by definition , alters the basic interrelationship of people to their environment and vice versa.

Urban behaviour and paradigm shifts,
the different speeds of cultural, social and technological shifts:

In urban environments, while the technological change is simple the social and cultural changes are not. The information based technology first used in business and science related fields and then spread out from working places to more social and cultural realms. Once it matured and its basic performance for granted was taken, then we assume it works just fine for our purposes. As a result we look for another properties : value, prestige, appearance and convenience, which means we interact with the technology, in a way that the nontechnical aspects of a technology can dominate(Norman 1998, Bull, 2000). While the rule of information technology gets pervasive in among public, the limits of the processing power of these information and knowledge based technologies are reached and new technological paradigms emerge. Hence the technology will be accessible in society and understands as material culture, which is a fundamental dimension of social structure and social change (Fischer, 1992). That is the time when the cultural and social behaviour will shift to new kind of society and network society emerges.

The main character of network society is its global character. They know no boundaries in their capacity to reconfigure themselves, which makes a social structure whose infrastructure is based on digital network considered as a global society. However, this does not mean that people everywhere are included in these networks (Castells,2002). In fact, for the time being, most are not, but everybody is affected by the processes that take place in the global networks of this dominant social structure. This is for core activities that shape and control human life in every corner of the planet and are organized in these global networks: financial markets, transactional production , management, and the distribution of goods and services, highly skilled labour,science and technology, communication media, culture, art, sport, and many more that assert the rights and values of a new global civil society (Castells, 2000a,b, Held and McGrew, 1999, Olkmer,1999, Tiglitz,2002, Juries, 2004). A network society is a society whose social structure is made of networks powered by microelectronics-based information and communication technologies.

However, the network society diffuses selectivity throughout the planet; it works on the pre-existing sites, organizations, and institutions that still make up most of the material environment of people's lives. The network structure is global, but most of human experiences are local. In radical terms, the network society must be analyzed, first, as a global architecture of self-reconfiguration networks constantly programmed and reprogrammed by different global forces;

second as the result of interaction between the various geographical networks that include the core activities, which shape life and work in the societies; and third as the result of a second-order interaction between these dominant networks and the geometry and geography of disconnection of social forms left outside the global networking logic.

Information networks and new urban agenda:

In information societies accumulation of things and geographical centrality are replaced by the flow of information and electronic connectivity. The virtual environments not only make the networks be integrated but also make built environments act as “Polyautomata”, which is multitude of interconnected environments that act in parallel to form new network of small scale spectrum (John Frazer,1995). From this perspective they are in constant interactions with their neighbourhoods in specific paradigms, which the rules for the individual cell are referred as ‘local’ and the overall behaviour as ‘global’ (Fraser, 1995). But these networks will not create entirely a new urban pattern from the ground up; they begin by morphing existing one (Mitchell,1999). Information networks have transformed the functioning of the systems to become as smart places. The smart character of these places is because of smart tools and soft ware. The new tools add new values to built environments in order to could embrace future anticipation and existence. Subsequently, the new values redefine the intellectual and professional agenda of architects, urban designers and others who care about spaces and places which we spend our daily lives (Manuel,2000).

The new urban agenda separates itself naturally in to several distinct levels of urban fabrics and people behaviour. The use of new technology enables new urban transport system, tools and spaces to change people’s behaviour and makes the urban environments be as part of their working, leisure and life spaces. Here we will increasingly take advantage of digital telecommunication technology to stay more closely in touch with places that are particularly meaningful to us, rather they are cultural, environmental or vigorous community life factors . The location matter shifts and the local environmental values high rise. The result is the shift of traditional urban land use zoning to interweave living and working spaces in a much finer-grained way (Manuel, 2000). The new agenda makes built environments be integrated with digital telecommunication infrastructures, new smart self respond places and traditional architectural elements. That will shift the function and values of existing urban elements and radically remake their relationships. *The resulting urban tissues will be characterized by mix uses and live/ work dwellings, twenty four hours neighbourhoods and far-flange configurations of electronically*

linked neighbourhoods, flexible and decentralized networks marketing and distribution systems and electronically summoned and delivered services.(Mitchel,1999:7)

To pursue knowledge based urban agenda effectively, we must extend the definitions of architectural and urban design to encompass virtual spaces as well as physical one, software as well as hardware, and interconnection by the means of telecommunications links as well as physical adjacencies and transportation systems to provide mix use. We should recognised that the fundamental relationships between homes and work places, sources of every day supplies and services and the essential bonds that hold the city together- may now be formed in new and unorthodox way and they create different urban life and form in future(Mitchell,1999:74) .

Integration:

Today we are at a critical juncture in the deployment of information technology in urban environment towards higher lever of integration and dynamic feedback relation with physical environment. The structure of this dynamism is based on constant interactions, which make the city able to respond to different paradigm shifts in multi performances such as ecological, environmental, economical, cultural or social paradigms. With the added dimensions to the architecture of built environments, they will be smarter through integrated processors, memory, sensors, communication capabilities and can serve us more efficiently by tackling additional tasks beyond their normal functions (Mattern,2001). There will be less perceptible computers and sensors, blending in to their environments and invisible but provide different views of urban units from the space or through information analysis. Thus the information based structures are able to respond and adapt to environmental stresses and dynamic loading also act like natural self organised system.

The constant sensibility of the urban system is not only seen in urban form but also it is about the tools of urban life. It is obvious that our near future will be full of tiny, spontaneously communicating processors that because of their small size and low price will be integrated in almost every day items (Mattern,2001). Self organised spaces, energy generating places , smart clothes with Bluetooth system, wearable electronics with powerful single chip music player IC for the MP3, WMA and AAC audio formats, multimedia jackets and self powered clothes are some samples for such shifts in technological paradigm. It not only has influenced our personal behaviour but also is expanding digital telecommunication infrastructure (Mitchell,2000). It is already changing the spatial distribution of economic and social activities and hence the life and

forms in built environments will be enabling dispersed decentralized transactions among people and organizations by facilitating new flexible and efficient systems of productions, storage and distribution (Mitchell, 1999,2000,Schäck,2001).

Whereas the Industrial Revolution forced the separation of home and workplace also inventing many specific tools to make life easier, the digital revolution is combine them together; intermixed urban complexes, multi use spaces or mobile phones with camera, computer, calculator and calendar, new printer scanner and copier machines, portable memories, iPods are samples of integration of many activities and tools together based on information technology . They provide close relationship between different activities in our daily life and enable us to do many at the same time. It changes our behaviour and the shape of the future places in long term how as we should make ourselves e prepared for. We are at the very beginning of this era of technology to change the physical world in to a big interacting computing platform in which information technology becomes omnipresent and entering all aspects of our life. Hence scalability, flexibility, mobility, security and heterogeneity are major challenges in built environments which required an appropriate integration in uses and functions in response to ultra urban paradigm shifts.

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