

Shrinking Spaces and Emerging Role of Information Technology in India

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1 ABSTRACT

The ever expanding Indian cities and its population from 27 million from early 20th century to 377 million in early 21st century put forth a challenge for urban planners and managers to solve complex integrated problems and to design smart sustainable cities. Even in near future the scale of problem will be going to rise as it is estimated that about 50 percent of total Indian population, which is about 814 million person, will be living in Indian cities by 2050. Moreover, the fastest growing or changing Information Technologies are playing a greater role in transformation of urban spaces in Indian cities. Hence, the present paper is an attempt to analyse the impact of Information Technologies in transformation of urban planning process in India. The paper, in relation with the case study of Delhi, analyse the implication of IT on city structure and urban spaces. It is certain the all aspects of urban fabric have an Information Technological print in different magnitudes and scale. Cybernetic age has given us different life style, working pattern and mobility behaviour. Increasing speed of internet from 2G to 3G, 4G and even 5G; from participatory interactive Web 2.0 technologies to Web 3.0, 4.0 technology; shrinking physical spaces of financial banks from whole building to Sq. meter, Sq. feet (ATM), inches (laptop), cm (Mobile), even mm (intelligent banking chip). Such technological, social, physical and economical changes will raise many question in the mind of planner, like is the functional boundaries of cities will vanish? Is IT will bridge the gap or create the digital divide among urban community? Is IT shrinking the urban spaces or not? After analysing the Indian urban and IT policy and understanding the Delhi Urban structure, the present paper tries to answer these questions. By understanding the existing complex settlement interdependence the present paper also recommends the possible solutions that IT may facilitate or hasten the development and, whether it needs to be treated as process and not an end. Finally the paper proves the hypothesis that “IT will shrink the space by eliminating the factor of time and distance by creating virtual space, but in reality it will make urban functional boundaries to sprawl and thus expand the physical urban space”.

Keywords: urban structure, spatial planning, web 2.0 technology, information technology, urban mobility

2 INTRODUCTION

Information and Communication Technology (ICT) along with Web 2.0 Technologies during the twenty first century has not only bring people closer but have affected the every aspect of urban community. With the innovation of ICT the physical and social structures of cities are not only changing but the system of governance and administration is also giving way to e-governance. In India the planning organisations and development authorities are under rapid transformation for giving way to IT and Web 2.0 Technologies for the preparation of development plans and projects. Infact, without any control, how rapidly the IT is transforming the people life style, mobility pattern, social behaviour, consumption pattern and access to knowledge, what will be the implication of IT on city structure? And what will be the effect on transport and traffic behaviour and pattern?, is a big question among Urban Managers and Town Planners. The present paper is an attempt to analysis the changing process of planning in information age in India and its implications on city structure. The present paper also explores the implication of information technology on city structure; urban transport, education and training. The interaction between human mind, information technology, computer system and communication network will guide the city structure, mobility behaviour, working pattern and life style. The Informational functional boundaries of cities will probably vanish but planning of cities through information technology base spatial planning will mark the boundaries of cities for preparation of development plans and will continue to serve the basic objective of planned design and development. The Informational functional boundaries of cities will probably vanish but planning of cities through information technology spatial planning will mark the boundaries of cities for preparation of development plans and will continue to serve the basic objective of planned design and development. Thus IT will shrunk the space by eliminating the factor of time and distance by creating cyber space but in reality IT will make urban activities to sprawl and contribute to further suburbanization making a challenge for

planner to plan the actual space for cyberspace. Hence, 'IT and Web 2.0 Technologies will probably explode the cities beyond its boundaries'.

3 EMERGING ROLE OF IT FOR URBAN AND REGIONAL PLANNING

At present the planning process in India is sectoral in nature and coordinated by various centrally sponsored schemes for the development of urban and rural areas. Hence, information or data generated at various levels/departments are not well coordinated/shared to meet the annual planning needs. Introduction of Information Technology (IT) would have a greater role in providing this much needed information base for planning and designing. Moreover plans are prepared by a participatory process in which vast number of human resources with technical and non-technical qualifications are mobilized. Introduction of IT will enhance the scope of participatory process of planning in India. If participatory annual planning and management is accepted by constitution then Internet based planning and management is the only approach available for urban and regional planning.

The information regarding the city, villages or regions are constantly changing in recent time than sixty years back when planning started in India. The same knowledge base regarding city and region is used by a variety of people for activities and functions. In the past, a 20 years plan was the main stay of urban and regional planning. Internet based planning allows coordinated working of departments and helps to participate people in planning and management. Networking with Internet breaks the conventional inter departmental barriers between the planners, technical providers of urban services, land and infrastructure developers and beneficiaries of planning. The interdepartmental coordination that was cited as main cause of plan implementation failure melts away in Internet based urban and regional planning. The Internet offers a domain in which every one can participate in formulation of perspective plan, five-year plan and annual plan at central, state and local level.

4 URBAN PLANNING THROUGH WEB 2.0 AND INFORMATION TECHNOLOGIES

ICT in its fully convergent form encompasses various forms of information delivery systems such as remote sensing based aerial photography and satellite imagery, media based information both electronic and print media, computers, internet, communication, etc., into one integrated environment which is considered as a major vehicle for all round socio-economic development in the country. IT has wide spread application in various sectors of development including planning, development and management of human settlements. IT should not be taken as replacement of existing techniques and medium available for planning and development rather it should be taken as an extension to facilitate the process of development, as such Internet is known as fourth mode of communication.

The basic data and information, both spatial and attribute, is the pre-requisite for preparation of Perspective, Development or Project Plan for any city or region. Aerial Photography and satellite imageries have successfully been used to generate layers of information in terms of base maps, physical and geomorphologic maps, land use analysis maps, spatial development and growth pattern maps, assessment and identification of physical resources, like water, soil, forest minerals, fauna and flora, structure and density of development environmentally hot spots, problematic and sensitive areas, identification of buildable and suitable sites for habitation, slum and squatter settlements, rough population estimates, unauthorised construction and development, flood prone areas, severe pollution affected areas, congested and overcrowd areas, traffic bottleneck areas, etc. All these information through IT, coupled with conventional means could be generated in a cost-effective manner with accuracy and authenticity. This will reduce the time required for preparation of plan.

Another set of attribute data, now available online are from the Census and National Informative Centre (NIC), Survey of India, National Spatial Data Information (NSDI) or other networks including Internet and theme based web sites. With the click of mouse a wealth of information could be scanned and downloaded for plan preparation. The data can also be collected through internet based household survey and participatory survey using Web 2.0 Technologies.

Once the basic data and information is compiled and collected through IT, it needs to be supplemented to bridge the gaps wherever necessary through conventional means, field surveys, sample surveys, participatory survey and from other secondary sources. All these information fed into the computer in Geographical Information System (GIS) mode could be analysed, processed and generated in the required format using

GIS packages and data base management packages. In this process computation and analysis of large amount of data, which otherwise takes months and years, can be done in few days ensuring accuracy in processing. In addition, it can handle any amount of complex data and help in developing models and alternatives.

The next stage is presentation of plan proposals and preparation of draft reports, computer based graphic packages, spreadsheet packages and word processing packages have almost revolutionised the presentation techniques. All the maps, drawings, charts, graphs, pictorials, etc., are generated through these techniques in a neat desired format and in the required presentation manner. Application of IT for this purpose not only improve the quality of output but also accelerate the generation of maps and drafts in a quickest possible time. The draft of the plan and project once put on Internet and specific web sites in an interactive system the public participation and inter-sectoral collaboration would be easier for refinement of the plans and draft.

The final plan and project once made available on internet and web site the various agencies responsible for implementation and enforcement of plans and projects could easily refer the proposals and provisions while taking up various projects and schemes for implementation. Monitoring of plan implementation would be easier in an interactive system. The entire plan with geo-reference in the computer provides a sound base for regulating the development, monitoring the development, and management of services. Sub-system for various aspect of plan like building permission and disposal system, land registration and deed issue system, recovery of land and property tax could be developed as part of Urban Information System through IT which would be helpful in monitoring and management of development as well as for review and revision of the plan in periodical manner. Smart and intelligent system for critical aspects of the development plan need to be developed for tackling the problems on fire-fighting basis like problems of unauthorised development, polluting units and industries in non-conforming areas, re-densification and decongestion in particular settings. Packaging of essential citizen's services at one central point has been successful experiments in redressal of public grievances and delivery of service through IT. For operationalising the emerging planning system in an effective manner the information technology will play a crucial role in facilitating the planning process at various stages ranging from collection of basic data and information for implementation and enforcement of plans. The Indian policy initiatives taken for wider application of information technology indicate that how IT can facilitate the planning and development process.

5 POLICY INITIATIVE IN INFORMATION TECHNOLOGY

Considering IT as an agent of transformation of every facet of human life, the Government has decided to make India a Global IT superpower and a front runner in the age of Information Revolution.

In order to achieve the goal of IT, the policies are envisaged for setting up the base for a rapid spread of IT awareness, propagation of IT literacy, networking of government functioning, IT led economic development application and penetration of IT in rural areas, development of training for IT, wider use of day to day IT services such as Tele-banking, Tele-medicine, Tele-education, Tele-document transfer, Tele-library, Tele-information centres, e-commerce, public call centres, etc. In view of the importance of information technology to be the frontier area of knowledge, an operation knowledge campaign is required to be launched by initiating various schemes and programmes. Information technology would be used as vehicle for all round socio-economic development in the country which in turn would facilitate creation of a strong domestic IT market. While taking pro-active steps to promote the growth of IT industry it is also being taken care of that, these developments do not create a new division in society, referred to as digital divide by some people- divide between those who have access to IT based services and those who do not. As Government has constituted a Working Group on Information Technology for Masses in May 2000, thereafter the Group is deliberating on major initiatives taken by various State Governments agencies for taking IT to masses i.e. potential areas and application for development of IT, schemes and programme for citizens participation and a comprehensive plan for taking IT to masses.

Over the years, departments of Central and State Governments as well as other agencies have been taking active interest to use IT in various public sectors. Some of the initiatives taken by Central and Government having direct and indirect bearings on Urban and Regional Development Planning may include: creation of web sites by the departments regarding various programmes and schemes operated by them for information of the public; development of Integrated Information System by the Planning Commission on various schemes being executed by NGOs in the country through various departments; countrywide programmes for land record computerization in collaboration with states etc.

At state level the Government of Andhra Pradesh has taken a lead in developing IT industry and use IT in the process of governance in citizens oriented schemes. Computer Aided Registration of Deed (CARD) is an important system developed by Registration Department for Completion of Registration deeds in one hour. Twin city Network Services (TWINS) has been implemented as a single counter packaging 18 types of citizen services and networking six departments of the state government. This service is being replicated at 285 counter on Build, Own and Operate (BOO) basis. Fully Automated Service of Transport department is another example of the use of IT. The Government of Delhi is preparing an IT policy to make Delhi into a Cyber city. IT Kiosks are being set up so that common man could interact with the government. Gujarat Government also plans to establish 1500 Information Kiosks in collaboration with private sector. Smart Card is being used by the Transport Department of issuing driving license. In Haryana it has been planned to have e-governance for urban and planning processes. Private sector would be associated for setting up IT kiosks. Action initiated for computerized operation of local bodies and municipal committees in the State.

The Government of Karnataka (at state level) has launched an ambitious IT policy called Mahiti to take IT to masses. In Bhoomi Project 190 lakh land records concerning to 60 lakh farmers have been computerized. High-speed network is being set up. IT initiatives taken by Kerala Government relates to project to be implemented in 1300 'panchayats' in the state which will have information on birth-death, caste ration card, social welfare scheme, housing schemes, etc., and subsidies and incentives. Single counter based services for seven departments known as Friend Project is being operated through IT. Housing Portal has been set up for providing information on housing schemes, availability of financing, and construction technologies. In Madhya Pradesh (State), Gyandoot is the main project under which 21 rural Cyber Cafes called Soochanalaysa have been established. Each Soochanalaysa provides service to about 10 - 15 Gram Panchayats, 20 to 30 villages covering 20000 to 30000 population - located at various public places, The service provided by these centres include among others marketing information, land records, etc. In Maharashtra (State) some of the major projects include registration and stamp duty, sales tax and transport departments. In Pune, District Collectorate (in Maharashtra State) has provided one point service to citizens on various functions performed by the collectorate. In Punjab Geographic Information System is being planned with basic parameters like village data base, road network, irrigation and canal network, power network and information regarding each department in the form of layers. The Government of Rajasthan (State) has decided to implement most of e-governance initiatives on it own. An information system for Mandis connecting 236 mandies (market) on line has been developed. Tamil Nadu (State) has given lot of emphasis on IT services being provided in local language. Broadband network infrastructure is being developed. In Uttar Pradesh (State) 70 out of 83 districts have optical fiber connectivity. Government is introducing separate channel on cable network in Lucknow (capital city of Uttar Pradesh State) to disseminate information related to government plans. In fact, lot of work done in the government sector need to be publicised to the public so that benefit of the existing level of IT induction reach to the people of the country. Thus, so far, the planning process in India is changing with the emerging role of Information Technology policy of India. We will move on to the implication of IT on spatial planning.

6 IMPLICATION OF IT ON CITY STRUCTURE

The major impact of IT on the Indian cities and region will be on land-use pattern as the information technology revolution will make hierarchical pattern of settlements obsolete and will lead to a new electronic cities and regions. Bill Gates, Kevin Kelley and John Naisbitt expect to see an array of positive developments and foresee radical changes in economics, politics, and culture of the cities and region. Involvement of IT in the planning process will lead majority of people empowered to participate in preparation of Master and Regional Plans and decision making process, which hope to expand productivity with improved employment opportunities and improved democratic process. Morphology of the settlements historically depends upon the spatial function of the cities and regions. However, with the IT revolution function of the cities and regions will occupy the place in cyberspace. Locational importance of the functions of the cities and region will lose to the cyberspace and mixed land-use will emerge on the real space. Hence, planning will be needed to plan the real space for the cyberspace. For example New Delhi, Capital City of India, has distinct land use zones of residential, industrial and commercial etc with multiple nuclei around which the city has developed. In New Delhi clustering of related land-uses around several nuclei created a cellular structure and the pattern is determined by the unique factors of specific site, culture and history. This 'multiple nuclei structure' of the city will transform into 'exploded structure' because most of the city

functions specific to the location will be lost to the cyberspace. As shopping will give way to virtual-shopping and commercial centre (which at present act as nuclei of the city) will lose the importance of location, and, can be located any where in the city or out of the city, or in other words, commercial zone will merge with the residential zone and transform the city structure into mixed land use. Thus with the popularity of e-commerce, e-governance, virtual shopping, virtual university, virtual classroom, virtual school, virtual theatre, virtual entertainment, more and more functions of the city will immerse over cyberspace and city will be dispersed by a process of leap-frogging over an enormously wide area. Thus New Delhi will spread over the suburbs with smaller satellites. These satellites will not even be reached by train or even by road but by super highways and optical fiber. Thus, if actual space not be planned judiciously and appropriately it will lead to several problems not only on space but also for cyberspace. As much as city functions released from locational constraints related to maximum acceptable commute time and distance, Information technology will contribute further suburbanization and urban sprawl. This will also have a direct impact on transport by reducing automobile and office use.

7 MANAGEMENT AND IMPLICATION OF IT ON CITY TRANSPORT

Transportation is an essential component of modern day living. Rise in per capita income coupled with inadequacy of public transport system has resulted in high private vehicle ownership in urban areas. The growth in per capita income coupled with the developments on other sectors have led to surge of vehicular traffic invading and consuming road spaces in the most unprecedented and unexpected manner. Traffic and transportation sector has been under severe stress in the cities. It is felt that only information technology revolution shall be able to cater the ever-increasing demand so this sector. Information technology will bring work place closer to the living place or at living place. This will reduce the commute trips and distance. By reducing trip distances and frequencies, overall fuel use by Tele-commuters will be reduced. In addition those Telecommuters will save themselves as well as the society in the related costs of operating motor vehicles. Reducing automobile use is one of the primary benefits of telecommuting. Studies of telecommuters have shown clear and dramatic reductions in all aspects of automobile usage (Handy, 1994; Kitamura, 1991). Thus IT users will eliminate two trips per day when they work at home. Elimination of automobile trips has tremendous environmental benefits, including reduced emission and reduced non-renewable fuel use. In 1985 Fathy's study shows that 32 percent reduction freeway congestion could be achieved by just 12 percent of the workforce telecommuting. IT can reduce speed-period commuting travel, and thus help reduce congestion and traffic load on freeways would remain more constant throughout the day, thus reducing peak period congestion. Telecommuters and teleshoppers may find less need for automobiles, and thus teleactivity may result in lower car ownership rates.

With the revolution of IT there may not be a need to travel long distance for the sake of job, thus may reduce pressure on urban infrastructure related to transportation. This will further have an indirect influence on the requirements of the flyovers. The information super high ways will reduce the use of roadways. The introduction and full use of new advance technology will affect inter-personal and inter-group equations. Delhi has been a case in India where the traffic is controlled at a central position in the traffic policy. The traffic conditions in the city became so grim that it was almost impossible to control it. But today the junctions of most important areas are signalised and are controlled and regulated by on-line technology. A computer programme i.e. SCOOT is integrating and co-ordination the signal system on a stretch. Also, the blank spots (accident points) of the city are on-line and are handled with GIS technology. Thus helps in reducing the number of accident.

The Intelligent Transport System (ITS) technology further enhances the safety efforts on the roads because they are centrally controlled in an integrated manner. Thus the role of information technology in streamlining the traffic by improving its efficiency and enhancing safety on the road can not be ignored. The Online/Telecommuting facility for railways and airways reservation is another important area where many trips have been curtailed. The booking of tickets or inquires into any matter has been made easy by Tele-commuting facility that is controlled centrally. The role of IT in implementing various transportation improvements measures is important and crucial. Intelligent Transportation system (ITS) helps in vehicle identification, vehicle guidance and provision of bus priority. The component elements would include Traffic Signal Controlled, Bus priority including Traffic Gates, Gap Generation, and Advance Stop Line etc. vehicle

detection is enable by use of fixed equipment like induction loops beneath the road surface, transponders in the bus or/ by Global Positing System (GPS) linked to computer on board the bus.

In recent times IT is increasingly applied to improve the operational efficiency of city bus system. Some of the examples include: Adelaide (Australia), Guided bus way, Sao Paulo (Brazil), Bus Convoy, Curitiba (Brazil), Segregated bus way, Istanbul (Turkey), Bus way Transit System, Ottawa (Canada), Bus Network and Bus Transit mail, Leeds (England), Guided Bus way.

8 IMPLICATION OF IT ON URBAN MANAGEMENT

Management aims at policy making and its implementation. This includes the issues pertaining to organizational resources such as financial and human, organizational structures and procedures. These are wider issues, which also cover the ways in which the managers interact with each other beyond their departments and also with the decision-makers and the public. Policy decisions affect the interrelations to a greater extent. Urban management has a close link with economic development and rural urban links. This has resulted in more expectations from the urban managers.

Technological advancements in the fields of computer application, data management, Geographic information System (GIS), GPS, Remote Sensing, Satellite communication system and information technology etc. have influenced the lives of urban people. These advancements have tremendous impact on urban systems especially telecommunications, micro processing, Tele-fax, email, e-commerce, fiber optics, digital calendars, file transfer protocol (FTP) software and CAD, CAM etc. These have been encompassing every sphere of urban activity including design, construction and management of construction projects, preparation of town plans and layouts and traffic automation and global information superhighways.

Organizing information is an essential element of urban management. Right to information of public domain data, consumer data, citizens rights, universal access, data relevant to development planning, financial data etc. drives the need for developing an urban information infrastructure. Proper urban planning, decision making and implementation of development proposals call for a generation of comprehensive information systems. The urban information system should include some of the areas like urban sprawl; urban land use; zoning, demography; urban environment; transportation housing settlement; urban infrastructure like water supply; sewerage; solid waste disposal; power supply; service facilities etc. Thus with the application of IT will not only help to manage the urban problems but also bring governing body and inhabitant of the city closer. And finally, more and more people will have the authority to take part in location specific decision making process.

9 CONCLUSION

Advancements in Information Technology, telecommunications, computer and satellite technology during the twentieth century has not only improved the connectivity but have affected the life style of people, process of governance and administrations, approach for planning and development, functioning of various urban systems, urban structure, social structure, education and various other facets of human activities. Urban and regional development was greatly influenced by access, distance and the average speed of motor vehicles. With the information and communication revolution-taking place, access, distance and average speed of motor vehicle need not be the major determinant of urban and regional development.

With the globalization, the price sensitive movement of commodities that can creatively make use of information and communication technology will determine the commodity movement. This will result in complex settlement interdependence. This is analogous to a situation where the dependent settlement structure will face sudden rapid change which need to be judiciously and appropriately planned. Fast convergence of Infotech, communication technologies and satellite technologies will have greater implication on the planning and development process of human settlements (town and villages). IT may facilitate or hasten the development scenario and as such it needs to be treated as process and not an end. The real test lies in the application of Information technology for making urban development planning an effective tool. The Informational functional boundaries of cities will probably vanish but planning of cities through information technology spatial planning will mark the boundaries of cities for preparation of development plans and will continue to serve the basic objectives of planned design and development. Thus IT will shrink the space by eliminating the factor of time and distance by creating cyber space but in reality, IT will make urban activities to sprawl and contribute to further suburbanization making a challenge for

planner to plan the actual space for cyberspace. Thus, Web 2.0 and Information Technology will may possibly explode the city.

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