

 reviewed paper

Building Inclusive Smart Sustainable Cities through Virtual Environment

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1 ABSTRACT

During the last century Urban Population of India has increased from 27 million to 270 million (2001) and now it has reached to 410 million people. By 2050 it is estimated that 814 million person will be living in Indian cities, which will share about 50 percent of the total population of India. Moreover, the share of slum population living in cities is about 21 percent which in absolute term is 90 million persons. If urban population is compared with urban internet user's population, it is estimated to be about 160 million in June, 2014. Thus, only 39 percent of urban population has access to internet facilities; though the users are growing at a rate of 47 percent in urban areas and more surprisingly 58 percent in rural areas. The present paper addresses the issue of access of internet or Web 2.0 technologies by economically weaker section of urban community for effective representation of public participation in the process of plan preparation and execution.

As now in India, with the taking over of BJP Government under the leadership of Honorable Prime Minister Shir Narendra Modi, planning for 100 smart cities by 2022 is the prime agenda for Urban Development. In this context the present paper examines the complexities of development and planning decision that are embedded in the process for establishing a smart city. No doubt Web 2.0 technologies in the cybernetic age is the fastest way to access, collect, analyze and transfer spatial information and providing innovative, sustainable, participatory solutions for effective government and community empowerment. However, due to the technological complexity, high cost, literacy levels, societal awareness and access to the technology create a social divide, more especially for low income group. Hence, the present paper answers the question that how society democratically and effectively access to Web 2.0 technologies for spatial information and translate the virtually tested, analyzed design in the real world. In overall, the paper tries to frame a concept in order to implement Web 2.0 technologies as a tool for building inclusive, smart and sustainable cities in India.

2 INTRODUCTION

The information and Web 2.0 technologies have revolutionized the way we live today. Infact these technologies have changed human behavior and the way we live, work, play and travel. Twenty first century witnesses new life style and demand for more transparent world in terms of governance and decision making. Moreover rising complex urban problems have made urban and regional planners and urban managers to analysis or simulate real world into the virtual world. Complex urban realities in India now forced planner to transfer professional intelligent to find innovative solutions and developing new policies, strategies, participatory rapid appraisal for spatial data collection, analyzing, finding low cost traditional technologies for providing basic services, generation of spatial plan for sustainable and progressive society. Thus in order to have inclusive, smart, sustainable spatial planning, town planners in Indian need to adopt innovative ideas for public participation by taking the help of GIS and Web 2.0 technologies. Today whole world is also driven by fast changing information and digital technologies on the one hand and reducing cost on the other.

As far as urbanization is concerned, during the last century urban population of India has increased from 27 million to 270 million (2001) and now it has reached to 410 million people. By 2050 it is estimated that 814 million person will be living in Indian cities, which will share about 50 percent of the total population of India. Moreover, the share of slum population living in cities is about 21 percent which in absolute term is 90 million persons. If urban population is compared with urban internet user's population, it is estimated to be about 160 million in June, 2014. Thus, only 39 percent of urban population has access to internet facilities; though the users are growing at a rate of 47 percent in urban areas and more surprisingly 58 percent in rural areas. The present paper addresses the issue of access of internet or Web 2.0 technologies by economically weaker section of urban community for effective representation of public participation in the process of plan preparation and execution.

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3 NATIONAL URBAN INFORMATION SYSTEM

India due to its diversity in climate, culture, physiography and urban transition translates into different system, of urban settlement in different regions. Even cities and towns in the same region often show very dissimilar outcomes in the extent and nature of poverty; in the patterns and growth rate of investment and employment; in the spatial dispersion and sprawl of residential and commercial areas; and in environmental quality and cultural amenities. Opening up of the Indian Economy has made India cities more vibrant and progressive and act as a centers of employment. However, with increasing rate of slums, crime and converting green field into concrete jungle, Government of India launches NUIS Scheme for generation of digital base with the help of Remote Sensing, GPS, GPR and GIS technologies. Hence, infact JnNURM Scheme also has mandatory reform to convert all land record data into digital spatial data through GIS software.

In India gradually the professional demand is also rising to promote GIS or Web based master plan or zonal plan. National Urban Information System (NUIS) Scheme of Town and Country Planning Organization, Ministry of Urban Development during the last decade had paved the way to tread common ground for generation of digital spatial database. Moreover, under NUIS Scheme GIS applications are used to customize packages to generate outputs for urban planning and management. Capacity building has also been inbuilt in the NUIS Scheme with the view to expose decision makers, supervisory staff and operators to the whole range of issues dealing with spatial and attribute data. The underlying notion is that planning and decision support is required to be based on accurate database with provision for periodic updating and develop skills of town planners to tackle real world problems in virtual environment. As a result about 30 training programmes were organised and 600 town planners/ urban managers were trained and 141 towns digital data based were prepared which led to the foundation for building smart cities through virtual environment. In this context, information and Web 2.0 technologies will play an important role for analyzing complex spatial problems and taking appropriate decision for implementation of inclusive smart sustainable cities. Capacity Building programme for everchanging information and Web 2.0 technologies should be in-built in the NUIS scheme so that the local knowledge and experience will be transferred into an information base. Hence with the help of Web 2.0 technologies, like twitter and Mashup, local urban knowledge will act as a current information resource. This will enhance the vision of urban managers and town planners and help to act innovatively, efficiently on higher capacity.

Implication for promotion of NUIS Scheme had resulted into change of strategies for development of spatial plan in GIS platform by Local Government and Development Authorities. In fact Jawaharlal Nehru Urban Renewal Mission (JnNURM) Scheme also has mandatory reform to convert all land record into digital format through GIS software. In order to have effective, smart and acceptable planning solution through public participation, Delhi Local Government floated a tender for preparation of Local Area Plan (LAP), with the help of modern state of art technologies. To it surprise Local Government has realizing that Web 2.0 technologies are much more effective and low cost or free, for gathering public information and suggestions for preparation of any spatial plan, right from Regional planning to Local Planning Area plans. However, due to caste, social taboo, illiteracy, non excess to the technology and low level of spatial/ map understanding, the public participation in planning process is low or negligible for low income group or lower class of urban community. Moreover, cost, complexity and limited access to GIS or Web 2.0

technologies, frequent transfer of skilled staff, lack of digital map and attribute data, absence of support for innovative practices have made even professional town planner limited in its approach to use Web 2.0 technologies.

4 WEB TECHNOLOGIES FOR URBAN AND REGIONAL PLANNING

In Urban and Regional Planning profession or during the preparation of Comprehensive Development Plan and Master/ Zonal Plan, community participation is an asset for preparing constraints and issues, mapping and also to identify what, in their opinion, are the special characteristics of their community. With the help of web technologies adding these comments directly onto a digital map makes it easier to share those ideas with others experts and import them into other programs for further analysis like GIS. Five years ago, this was a challenging task, since we had to spend a considerable amount of time customizing mapping programs to collect comments. Today, we use tools like Google's maps, Yahoo maps, Wikimaps etc, to quickly set up a map that everybody can access and add comments to.

With GPS enabled tablet PC's or phones, people may add comments, photos, and even video to a map or photo gallery with the geo-location embedded in the information. Using this all comments show up instantly in a common space for others to see and respond. Push technology, can be used to keep people constantly but unobtrusively aware and remain engaged in discussions. Thus, the new concept of 'Mashups' is emerging in Urban and Regional Planning through Virtual technology.

5 CONCEPT OF MASHUPS

Making Web as more interactive, user-friendly and which suits needs are actively emerging as Web 2.0, the new internet is increasingly dominated by the user. The concept of Web 2.0 allowing users to submit content, modify and add to open source software, and create new services and features using existing structures. One of the most common outcomes of the Web 2.0 philosophy and structure is a mashup. A mashup is a web application that combines data from more than one source into one integrated tool. These mashups are created by internet users, for internet users. GoogleMap's, Map my India and Wikimap are very popular sites that may be quickly incorporated into mashups. There are over 1500 Google Maps mashups in existence, allowing users to calculate electoral votes spatially, rate restaurants, map out their running routes, and even plot celebrities' homes on a map or share stories. The potential utility for Google Maps mashups in Urban and Regional Planning is enormous. User submitted information can make the job of planners much easier. In particular since communities are often competing for new residents based on the quality of life they offer, mashups are a very useful tool for both planning and economic development. Communities looking to support local businesses, highlight aspects of community character, or advertise local festivals all can find a Google Map's mashup to help them do so.

For example morning walk communities that are planning to find better place or route is a more advanced mashup for good health, better environment and sustainable city research, which helps a particular community to plan routes using a variety of criteria such as distance, elevation change, air quality, and amount of vegetation. This type of mashup, can also calculates calories burned and index of good health better working performance. This mashup could contribute to increasing morning walker safety. Planning offices could provide this service using base GIS data and let citizens add useful information, such as green areas needed for better health, the location of yoga centres, or particularly scenic or safe routes. As the internet moves ever more toward user generated content and functionality, planners have a tremendous opportunity to take advantage of community knowledge especially through spatially oriented mashups. Such Mashups can be used to maintain power and water supply, efficient traffic and transportation system, safer cycling route, safer school cab route, efficient management of other services for the community etc.

It is only evident that adoption of virtual technology will rapidly transform the Urban and Regional Planning education and profession and fundamentally change the way planners design for future smart and sustainable human habitat. Hence, smart way of planing sustainable cities is to use Mashups as one of the Web 2.0 technology option. However, how to make Web 2.0 technolgy inclusive is a big question?

6 ESTABLISH INCLUSIVE WEB 2.0 TECHNOLOGIES AT LOCAL LEVEL.

Proliferation in the use of the Internet in India is very much on cards. That means, global accessibility to the data stored on the website independent of physical location is possible. The planning process can, therefore,

be made more participative and interactive in nature. Anyone can view the planning proposals and the maps when ported on the website of the planning authority and register suggestions and objections, even on-line. Downloading of permission forms can also be facilitated through the web site of a planning authority. Dissemination of information and delivery of certain services to the citizens can thus be simplified and expedited with the help of Web 2.0 technologies.

Other than traditional way of involving people by organizing 'public participation workshop' a community base local Neighborhood Digital Technology Center (NDTC) should be established for

- (a) provide access to GIS and Web 2.0 technology;
- (b) provide information for other related information generation agencies;
- (c) Store public information and database.
- (d) Analyze public information and feed to the main City Digital Technology Center (CDTC).
- (e) May influence decision making and participatory planning processes.

These NDTC should be managed 'by the people'; provide information to planning authorities 'for the people'; and information generated 'from the people'. NDTC should be accessed by any local community and thereby giving the people empowerment and direct access to digital spatial data system. Other than NDTC, ward wise community base local neighborhood group (NG) should be identified for provide training and access in GIS and Web 2.0 technologies especially in poor and slum areas for inclusive public participation. Thus this is the answer to digital divide and reducing the gap between planning professionals and local public.

Supportive infrastructure and services should be developed in a systematic manner so that GIS and Web 2.0 technology should be available in the remotest part of the country. The present level of IT services and facilities by (National Informatics Centre) NIC are inadequate to reach the digital technological services to the common man. Besides availability of digital technological services its affordability and access is also important. The communication and networking infrastructure need to be established, preferably introducing newer and low cost technologies for easy access to the remotest corner of the country.

Town and Country Planning Organization under the Ministry of Urban Development should identify certain smart citizen oriented services for use of digital information generation so that its benefit reaches to the lower section of the urban community. This would call for sustainability of good quality of Web 2.0 services to citizens for e-governance of the Town Planning organizations and departments which should be fully computerized for delivery of public services and internal functioning of the office. The planning and building permission, change of land-use cases, and implementation of Master Plans are some of the areas which need to be managed by GIS and Web 2.0 software for easy access to the masses.

GIS and Web 2.0 technologies education and training and its application for public awareness is another important issues which will act as a foundation for the growth/ success of Web 2.0 technologies. The School of Planning and Architecture (SPA) should take a lead role to facilitate IT and Web 2.0 technologies education to foster budding planner for smart understanding of Web 2.0 technologies. The existing planning professional should be given short training to become technology savvy. One of the most important area is software development, hence Entrepreneur GIS and customized Web 2.0 technologies for planning application and tools should be developed. These softwares need to be simple, user friendly and affordable. For Web 2.0 technologies Promotional Group professional organization (like TCPO) and educational institutions (like SPA) should be integrated to maximize the output and professional satisfactions.

An awareness programmes to make Web 2.0 technology based planning and public participation software, as a mass movement need to be worked out by encouraging value added network services in the form of 'Telematic Kiosks/ window for 'One window and Non Stop' series for the urban community. These programme and training should be in local or regional languages in order to have easy understanding and social acceptability.

7 CONCLUSION

Biggest advantages of Web 2.0 technology is to have direct and immediate access to information by town Planning professional and urban manager to take sustainable decision base on opinion of all levels of urban community. Moreover establishment of NDTC will give local urban community free hand to tailored or

customized Web 2.0 software as per their need and requirement and generate or manipulate their own information or spatial data rather than given answer or raised query to the predefined proposed land-use map. Hence, GIS and Web 2.0 technology is an inclusive, smart and sustainable way to build our cities. In short all those impediments in the way to establish Web 2.0 technologies application need to be removed so that it is available economically, interactively, in limitless capacity and round the clock. But success of implementation of Web 2.0 technologies will only depend how effectively capacity built within the urban communities. As Toppeta rightly said, 'smartness means a combination of ICT and Web 2.0 technology to find out innovative solutions and improve sustainability and livability'.

8 REFERENCES

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