Chapter 45
Need for Rethinking Modern Urban Planning Strategies Through Integration of ICTs

Rounaq Basu
Indian Institute of Technology Bombay, India

Arnab Jana
Indian Institute of Technology Bombay, India

ABSTRACT

Recent progress in ICTs have paved the way for innovative services and interactive models and tools. Citizen participation and open innovation have become essential tools for urban planners. These concepts can be implemented through the crowdsourcing model, which is a people-centric approach to solve societal problems using Web 2.0 technologies. This has led to the collection and sharing of geocoded data through GIS. The large amount of data required is one of the drawbacks of GIS. However, collecting such data within short duration at minimum cost has now become possible through the development of web-based surveys coupled with use of DBMS. The effectiveness and importance of these three tools (crowdsourcing, GIS, and DBMS) in modern and future urban planning strategies cannot be undermined. In conclusion, the authors argue that integration of urban policies, modern technologies, and fundamental concepts of engineering will lead to discovery of new solutions to important age-old urban problems.

INTRODUCTION

Urban planners work towards achieving the three goals of environmental protection, economic development and social equity with the major focus being sustainable development (Campbell, 1996). Many practitioners feel that traditional urban practices have served their purpose, and it is time to search for a new approach which encourages openness and participation. However, conventional measures to enroll people in participatory planning activities have been found to be limited in both scope and reach. These findings coupled with recent advances in innovative technologies have led to opportunities to re-think the status quo in urban planning.

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Information and Communications Technologies (ICT) have always been essential for new application opportunities. Recent progresses have paved the way for innovative communication services, and interactive models and tools for collaborative activities. Infrastructure can be made to dynamically and adaptively connect and collaborate in each other, thereby turning urban environments active and our cities into socio-technical organisms. Web 2.0, as suggested by O'Reilly (2007), has transformed the Web by turning it into a participatory platform where users can simultaneously consume (download) and share (upload) content. Web 2.0 techniques are linking users and data providers, thereby removing the barriers in direct communication that existed earlier (Hudson-Smith & Crooks, 2008). Embedding these technologies into existing institutionalized processes still requires significant effort despite the collaborative and user-friendly nature of Web 2.0 services and applications.

ICT tools have the potential to radically impact modern urban planning strategies, thereby leading us into a new age of urban renaissance where we witness smart, digital, information and connected cities come to life. The applications of these tools vary widely, from a simple e-commerce service to complex data collection for decision making. These pervasive technologies have the power to impact dialogues between city managers and citizens, drive a shift to e-government services such as mobile health units and online payment solutions, and transform urban mobility through cloud communication and storage. The authors argue that there is potential for development of a new urban planning approach in which emphasis is given on active public participation through the use of Web 2.0 technologies. Thus, the role of urban planners needs to be redefined accordingly. Planners would benefit from integrating their current practices with modern ICT inventions to obtain socially inclusive long-term solutions. This chapter focuses on three of the most widely used ICT tools which have the potential for creating the highest impact in the field of urban planning: (1) Crowdsourcing, (2) Geographic Information Systems (GIS), and (3) Database Management Systems (DBMS).

The remainder of the article is organized as follows. The next section provides a detailed discussion about how crowdsourcing can be incorporated in the urban planning process. The associated challenges and benefits of its implementation have also been listed. Applications of a well-developed and vastly used tool in urban planning (GIS) are enumerated in Section 3, along with future research directions for further innovation. New ICTs have enabled us to collect and process large amounts of data. The importance of these tools (e.g. a DBMS or a web-based survey) is highlighted in Section 4. An application developed by the authors is also introduced in this section. Concluding remarks and future research directions are proposed in the final section.

BACKGROUND

Crowdsourcing is a relatively new concept that incorporates a variety of services and activities. It can be characterized by any category of collaborative activity over the internet (Estellés-Arolas & González-Ladrón-de-Guevara, 2012). Crowdsourcing involves mechanisms that aim to leverage the collective intelligence of users for a productive outcome (Brabham, 2009). Jeffrey Howe coined the term '*crowdsourcing*' in an issue of *Wired Magazine* (Howe, 2006). Simply put, crowdsourcing harnesses the joint creativity of the public by creating an open call for proposals through Web 2.0 technologies in the hope of innovative and more robust solutions (Seltzer & Mahmoudi, 2013).

A classic example of crowdsourcing is Wikipedia due to its strong collaborative nature. Using the generalized crowdsourcing model shown in Figure 1, let us further analyze the Wikipedia example. The