Need for Rethinking Modern Urban Planning Strategies Through Integration of ICTs

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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.

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 ear-

lier (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 organization (Wikipedia.org) floats a topic and asks users to provide details about that topic (the problem). Due to its open-source nature where all users can freely edit the article, information is obtained from a variety of sources (individuals, groups and experts). Once all users are satisfied with the content on that topic (solution), Wikipedia finalizes that article and publishes it as a page (implementation). The entire world (not just those who contributed) can now benefit from the knowledge in that article. This is a continuous process, as more users can update or edit the information with progress of time, leading to continuous quality monitoring and improvement.

The crowdsourcing model asserts that online communities have '*collective intelligence*' (Pierre, 1997) and '*crowd wisdom*' (Surowiecki, 2004). It is quite intuitive that cognitively diverse communities would provide perspectives that a field

Figure 1. Generalized crowdsourcing model
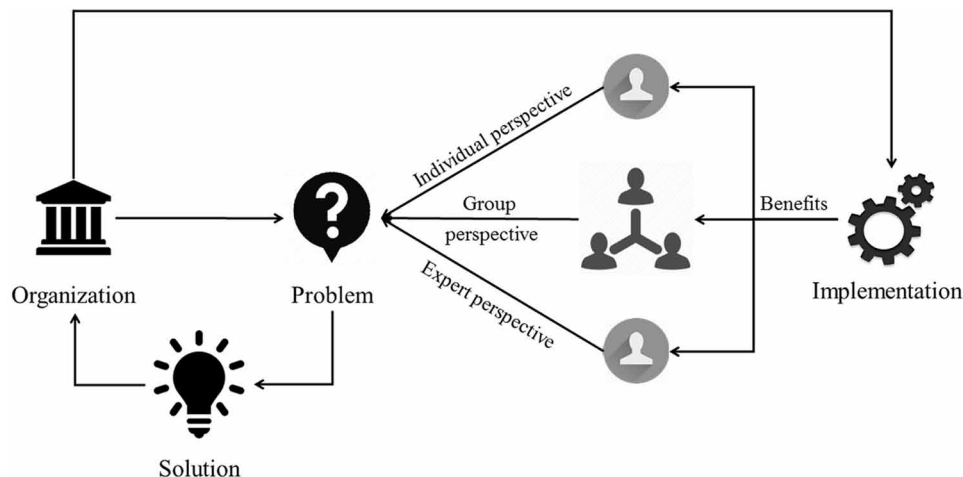
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