Chapter 9
The Geospatial Web:
A Tool to Support the Empowerment of Citizens through E-Participation?

Karl Atzmanstorfer
Paris-Lodron University Salzburg, Austria

Thomas Blaschke
Paris-Lodron University Salzburg, Austria

ABSTRACT

This chapter introduces a spatial view to e-participation in urban governance which is based on the technological core of Geographical Information Systems (GIS) and their more recent transformation into service architectures. The chapter begins with the premise that the technological realms are available today in professional software packages and in open source software environments. It focuses on the utilization of GIS and various methodologies in participatory planning projects. The technical descriptions are limited to a degree that the reader can understand the applications envisaged. The chapter describes developments in the GIS domain which are summarized under the term 'Public Participation GIS' (PPGIS) since the 1990s. In 2005 however, the launch of Google Earth changed the situation significantly: such mapping platforms—including Microsoft Bing and others—brought mapping functionality to the computers of hundreds of millions of internet users and soon after, the term "volunteered geographic information" was created. It refers to the two-way communication possibilities using geospatial tools and to the participation of citizens in planning initiatives. The chapter highlights a few of such applications in urban planning and administration and discusses the situation in developing and emerging countries, while posing the question of whether or not such options may lead to an empowerment of citizens.

INTRODUCTION

Geospatial technologies were originally associated with the term Geographic Information Systems (GIS), which underlying principles were developed in the 1960s and 1970s. Today we can state that basically all concepts which are necessary to acquire, handle, analyse and display spatial data have matured and are available in professional software solutions. Second, it is estimated that nowadays more digital maps or map-like representations are produced within one day than printed maps were produced in the history of mankind. The wide use of GPS, virtual globes, smartphones

DOI: 10.4018/978-1-4666-4169-3.ch009

as mapping devices and other web-mapping tools has rendered possible new approaches for disseminating information and collecting crowd-sourced spatial data (Volunteered Geographic Information). These rapidly evolving technologies have brought new perspectives for redefining participatory spatial planning, e-government and urban administration, with the aim to empower citizens and communities that so far have been excluded from decision making processes. In this chapter we analyse the role of geospatial web-tools and platforms for e-participation with a particular focus on geospatial participative procedures that are triggered to support urban planning and governance, especially in developing and emerging countries where shortcomings of democratic, collaborative and integrative local and regional planning are most obvious.

FROM PUBLIC PARTICIPATION GEOGRAPHIC INFORMATION SYSTEMS (PPGIS) TO THE "GEOSPATIAL WEB"

In this section we give a brief introduction to Geographic Information Systems (GIS) as they allow the collection, processing and disseminating of spatial data, which is crucial for spatial planning. We present Public Participation GIS (PPGIS) as an approach to include citizens and communities in spatial planning and public administration, and recap the most important methods of Spatial Decision Support Systems (SDSS). Then, we analyse how the advent of Web 2.0 technologies has provided us with an increasing number of web-tools that integrate crowd-sourced data and geo-web platforms. We critically analyse whether or not these new tools increase participation of individuals and communities in spatial planning and public administration, and if they boost the empowerment of citizens in general. Furthermore we have a closer look at controversially discussed issues such as usability, privacy and quality issues that are inherent to geospatial web technologies.

A BRIEF HISTORY OF GEOGRAPHIC INFORMATION SYSTEMS (GIS)

The idea of portraying different layers of data on a series of base maps, and relating things geographically, has been around much longer than computers (Goodchild et al., 1990). One of the earliest examples of an analysis of a real-world phenomenon with an explicit spatial focus is Dr. John Snow´s map showing locations of death by cholera in central London in September, 1854 (Wienand, 2007). He used the map to track the source of the cholera outbreak to a contaminated well – an early example of spatial analysis. Indeed, the origins of spatial analysis refer to mapping of spatial events and then overlaying the information in order to see where overlapping occurred. Before the widespread availability of computers, this effect was first achieved through a base paper map and then physically overlaying transparent printouts on top.

However, the foundations of GIS as we know them today were laid in the 1960s with the first primitive computers being available for scientists. In this 'era of innovation,' Roger Tomlinson, the 'Father of GIS,' initiated the Canadian Geographic Information System (CGIS) in order to facilitate use of land inventory data in federal, provincial and regional planning – the first fully operational GIS in the world was born (Longley et al., 2001).

The 1970s saw key innovations such as the first mapping software SYMAP, mainly driven by the Harvard Laboratory for Computer Graphics and Spatial Analysis (Lembo, 2005). Furthermore, the first Earth observation satellite – Landsat 1 – was launched in 1972, which brought completely new perspectives for generating spatial data, as well as insights into processes at the Earth's surface. The 1980s brought the commercialisation of GIS, which was now recognized by an increasing number of users in academia and public administration. ArcInfo from the US-based company ESRI was the first major commercial GIS software system (Longley et al., 2001). The launch of the Global Positioning System (GPS) by the US-