

Chapter 33

OpenStreetMap

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ABSTRACT

OpenStreetMap is a collaborative web-mapping project that collects geospatial data to create and distribute online maps, freely available to anyone with an Internet connection. Once accessed, OpenStreetMap allows Internet users to contribute and edit geospatial data, effectively making it the mapping equivalent of Wikipedia. OpenStreetMap is maintained by volunteer cartographers from around the world who use GPS devices, portable cameras, and laptops for field mapping. Collected data are complemented with digitised open source aerial photography and free maps from the governmental and commercial sources. This report provides a summary of OpenStreetMap as a remarkable example of participatory geographic information systems (GIS).

INTRODUCTION

OpenStreetMap (OSM) is a collaborative web mapping project—an example of participatory GIS—which makes free crowd-sourced geospatial data available to anyone with access to the Internet. OpenStreetMap was started in 2004 by Steve Coast, a programmer from the United Kingdom residing in London. Using his laptop and a global positioning system (GPS) receiver, Steve Coast began mapping his neighborhood, paying

attention to the locations of particular interest to him, and including much more detail than any available online map service was providing at that time. He correctly envisioned that making such data augmentable, editable and freely available online, where anyone could access or contribute information, might create a snowball effect, which would eventually lead to the development of, in his own words, a “jigsaw map of the world” (Musgrove, 2010).

Since its inception, OpenStreetMap has attracted countless Internet users throughout the world who have contributed to the project in differ-

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ent ways. At the time of the first State of the Map (SoTM) conference, set up by OpenStreetMap Foundation in July 2007 in Manchester, there were only 9,000 registered users. Starting from 2007, Yahoo! allowed OSM to tap into its vertical aerial photography database, which greatly facilitated the progress of the OSM project (in 2010 Microsoft's Bing Maps also released its aerial imagery for the OSM). By August 2008, the number of registered users rose to 50,000; by March 2009, the number rose to 100,000 members; and by the beginning of 2010 the project had 200,000 members. In November 2011 the total number of volunteers reached 500,000.

Among other milestones, one should mention: (a) valuable functionality was added in January 2008 making OSM available for cyclists who started downloading map data to use it on trips; (b) funding of 2.4 million euro became available from CloudMade, a company founded by Steve Coast, that uses OpenStreetMap data for providing commercial geospatial services; (c) in September 2009 Flickr announced that it began supporting OpenStreetMap, which allowed geotagged photos of landmarks to be uploaded to the OpenStreetMap server (Lardinois, 2009). Currently, netizens around the world utilize and update data available at the project's website OpenStreetMap.org. Citizen cartographers range from volunteers providing humanitarian relief work in disaster regions—where up-to-date maps are essential and could be a matter of life and death for the victims—to residents of cities, small towns and villages; who simply want to map their neighborhoods or highlight certain landmarks that might be of interest to others. At the time of this writing, OpenStreetMap community continues to grow with contributors across the globe submitting novel data or editing existing information.

Probably the most significant use of OpenStreetMap has come in the aftermath of the massive earthquake that struck Haiti on January 12, 2010 with the epicenter located 25 km to the west of the country's capital Port-au-Prince. Pre-earthquake

maps of Haiti contained little more than a few highways and roads, with Port-au-Prince being signified by a shaded outline. Haiti is one of the poorest countries in the Western Hemisphere, and as very few of the population could afford GPS, there was no point for the commercial mapping services in creating accurate digital maps. The lack of an accessible online cartographic reference had serious impeding implications for the relief efforts once the catastrophic earthquake killed hundreds of thousands of people, and made close to one million homeless. International rescue and aid workers who were trying to provide much needed relief encountered many problems identifying what roads and routes were available for the rescue and delivery of the necessary supplies.

According to the website CrisisCommons.org, there were a number of stages in the development of the inclusive Haiti maps to allow the aid workers to get help to the victims. Firstly, there was an immediate search for all available period and contemporary maps. These included various historic maps and even maps unclassified by the CIA. Due to critical circumstances, the New York Public Library, which has a specialized Map Rectifier facility, provided volunteer cartographers with NYPL Map Warper, a software application that allowed for digitizing of the historic maps of Haiti and aligning them with contemporary maps. At this point, OpenStreetMap volunteers began to get deeply involved with the project. Before the earthquake of 2010, they had already collected some mapping data of the disaster areas, which were used in conjunction with historic maps. Starting from this point, the OpenStreetMap community began collecting and editing the field data and mapping collapsed bridges and impassable roads, locations of hospitals and refugee tent camps, as well as accurately marking the position of damaged buildings where victims could remain trapped. The next vital step involved the United Nations releasing satellite imagery of the region for public use, a move that was followed by commercial satellite overhead imagery provid-

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