Chapter 13

Comparative WebGIS Software Study:
How to Support Users Decisions on the Best Solution to Their Organizations

Sandra Ventura

ESCE, Instituto Politécnico de Setúbal, Portugal

Alcina Prata

ESCE, Instituto Politécnico de Setúbal, Portugal

ABSTRACT

The rapid evolution of information and communication technologies (ICT) has supported many changes in many areas over the last decade. One of the most successful ICT technologies to emerge was geographic information systems (GIS). These systems allow people to see the world differently, mapping the position and quantity of things, mapping the density of people and objects, and mapping any changes that occur. GIS also allows us to find out what is happening within a specific area or nearby. They can be used in various ways and across diverse areas thus becoming an important area of research. Regarding this chapter, the advantages and disadvantages involved in the use of GIS, especially WebGis or geoportals, were explored and presented, as well as a detailed comparative study in what concers to the main WebGis software solutions in terms of characteristics and functionalities. The main goal of the chapter was to provide users with a list of important recommendations that could help them in the process of choosing a WebGIS software, both in terms of free and proprietary solutions.

INTRODUCTION

Maps are essential tools in everyday practices, in personal and professional terms, and technological developments have contributed to the transition of cartography from its physical form (paper) to its current form (digital). Nowadays, cartographic information on natural risks favors interactivity, it is increasingly stored and made accessible online thanks to the dynamics of web tools (Arnaud, 2009).

The increasing availability of spatial data systems and the rapid growth of Geographic Information Systems (GIS) technologies, is being used by Organizations, as an important tool to optimize their operational efficiency. In simple terms, GIS is the merging of cartography, statistical analysis, and database technology and helps to create new and revolutionary applications and possibilities. The software for GIS is unique in its ability to manipulate coordinates and associated data attributes and a considerable number of software tools and packages is available to help developing GIS. With the continuous improvement of technology, the future of GIS looks brighter than ever before.

Extensive knowledge on database technologies, map servers, web servers, desktop clients, application-specific business layers, as well as the integration of each component of the system, are necessary to address the data and its application layers. Currently, the Internet access is quite popular. Thus being, a great diversity of platform technologies were made available on the Web to allow, through a web browser and in a simple, fast and intuitive way, the performance of operations on potentially interesting geographical data sets. In general, this set of technologies and platforms offer several features depending on the capabilities of the software, allowing users to perform basic GIS operations, such as viewing, consulting and analyzing distributed geographic data. These applications that allow the distribution of data to users through the interface of a Web browser are, in general, called WebGIS (Bonnici, 2005).

Concluding, the merge of GIS technology with the Internet has introduced a new application area called WebGIS, the short term used to Web-based GIS. The term "WebGIS" refers to applications that distribute spatial data to users via a Web browser (Agrawal & Gupta, 2017). WebGIS applications have unique capabilities to integrate and allow access to disparate data sets. Depending on the software capabilities, users may view, query and analyze geographic data remotely via a Web browser. Because it is a relatively inexpensive way of disseminating spatial data and basic GIS functionalities, WebGIS have become widely used by both public and private organizations. Another advantage is that the majority of the basic functionalities available through the desktop GIS, are already available through the World Wide Web or intranet, thus allowing users to interact with the GIS databases through both technologies. Following Bonnici (2005), the main benefits of WebGIS include, amongst others, the following ones:

1. WebGIS have the ability to distribute GIS data and functionalities to a large audience and is constantly available;
2. WebGIS users don't need to buy GIS software;
3. WebGIS users do not normally need extensive training due to its easy of use.

Similarly, following Ali Khan & Adnan (2010), the main reason behind the popularity of webGIS applications is the availability of these applications without the need to buy and install software. Using these applications does not require any expertise because of its simple and easy to use interfaces which is also a determinant factor.

In fact, with the emergence of internet and WebGIS, applications got a new ride. Nowadays, almost all businesses, government agencies and common people are regular users of webGIS applications and use them for different purposes like decision making, planning and as problem solving techniques. As internet is spreading, more people get access to it and its services. A good example of generic WebGIS use, relates to the use of GIS applications and satellite images to search directions when traveling.

The grouth of the search for GIS, in turn, disseminated the application of this technology to various segments, such as data conversion, application development, data mining and data migration. The development of GIS applications started to be extended beyond the Municipalities, or Central Administra-

Related Content

Strategies to Implement Edge Computing in a P2P Pervasive Grid
Luiz Angelo Steffenel, Manuele Kirsch Pinheiro, Lucas Vaz Peresand Damaris Kirsch Pinheiro (2018). *International Journal of Information Technologies and Systems Approach (pp. 1-15).*
www.irma-international.org/article/strategies-to-implement-edge-computing-in-a-p2p-pervasive-grid/193590

Overview of Machine Translation Development
Irene Rivera-Trigueros, María-Dolores Olvera-Loboand Juncal Gutiérrez-Artacho (2021). *Encyclopedia of Information Science and Technology, Fifth Edition (pp. 874-886).*
www.irma-international.org/chapter/overview-of-machine-translation-development/260236

The Role of Robotic Telepresence in the Academic Library
Emy Nelson Decker (2015). *Encyclopedia of Information Science and Technology, Third Edition (pp. 6648-6655).*
www.irma-international.org/chapter/the-role-of-robotic-telepresence-in-the-academic-library/113125

Outage Analysis and Maintenance Strategies in Hydroelectric Production
Reginald Wilson (2015). *Encyclopedia of Information Science and Technology, Third Edition (pp. 2686-2698).*
www.irma-international.org/chapter/outage-analysis-and-maintenance-strategies-in-hydroelectric-production/112686

Construction and Application of Power Data Operation Monitoring Platform Based on Knowledge Map Reasoning
Zhao Yao, Yong Hu, Xingzhi Peng, Jiapan Heand Xuming Cheng (2023). *International Journal of Information Technologies and Systems Approach (pp. 1-14).*
www.irma-international.org/article/construction-and-application-of-power-data-operation-monitoring-platform-based-on-knowledge-map-reasoning/323566