Chapter 1
Showing the Past:
Integrating Cartographic Collections through Virtual Map Rooms

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ABSTRACT

Spatial Data Infrastructures have become a methodological and technological benchmark enabling distributed access to historical-cartographic archives. However, it is essential to offer enhanced virtual tools that imitate the current processes and methodologies that are carried out by librarians, historians and academics in the existing map libraries around the world. These virtual processes must be supported by a generic framework for managing, querying, and accessing distributed georeferenced resources and other content types such as scientific data or information. The authors have designed and developed support tools to provide enriched browsing, measurement and geometrical analysis capabilities, and dynamical querying methods, based on SDI foundations. The DIGMAP engine and the IBERCARTO collection enable access to georeferenced historical-cartographical archives. Based on lessons learned from the CartoVIRTUAL and DynCoopNet projects, a generic service architecture scheme is proposed. This way, it is possible to achieve the integration of virtual map rooms and SDI technologies bringing support to researchers within the historical and social domains.

INTRODUCTION

At the present time, almost all map libraries on the Internet are image collections generated by the digitization of early maps. These types of graphic files provide researchers with the possibility of accessing and visualizing historical cartographic information keeping in mind that this information has a degree of quality that depends upon elements such as the accuracy of the digitization process and proprietary constraints (e.g. visualization, resolution downloading options, copyright, use constraints). In most cases, access to these map libraries is useful only as a first approach and it

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is not possible to use those maps for scientific work due to the sparse tools available to measure, match, analyze and/or combine those resources with different kinds of cartography (Fernández-Wyttenbach, Siabato, Bernabé, & Wachowicz, 2010). It is necessary to design a set of tools that offer the advantages of real map libraries into a virtual environment, offering advanced online measurement and georeferencing tools, providing the capability of comparative analysis between two or more maps and specific tools in order to facilitate querying and visualizing process.

Two such online sources are *The American Geographical Society Library Digital Map Collection* (2009) and the *LUNA Browser* (Rumsey, 2010) of the *David Rumsey Map Collection* (Rumsey, 2011). The American Geographical Society collection contains over 500 maps ranging from early maps of Asia to historical maps of Wisconsin and Milwaukee. The David Rumsey Map Collection, by contrast, has over 25,000 maps and images online, this collection focuses mainly on rare 18th and 19th century maps of North and South America as well as other cartographic materials. The user interface allows accessing and querying certain characteristics but they do not provide tools to analyze the maps, much less integrate them in a geographical context. Another relevant online historical content provider is *The World Digital Library* (U.S. Library of Congress & UNESCO, 2010). The WDL makes it possible to discover, study, and enjoy cultural treasures from around the world on a single website. Its cultural treasures include but are not limited to maps. Nevertheless, WDL is once again an interesting data repository in which the opportunity to provide geographic tools was not taken.

Applications that are more recent provide the geographical context but there are not enough tools for getting the most from the maps. A first approach was the *Google Maps Rumsey Historical Maps* portal of the *David Rumsey Historical Maps* collection (Rumsey, 2008). These new interfaces (Google Maps and Google Earth) allow visualizing the early maps on Google´s globe. This way, it is possible to visualize them georeferenced and to compare them with contemporaneous cartography. Over one hundred and twenty historical maps have been selected by David Rumsey from his collection of more than 150,000 historical maps to be shown on the Google viewers. This small sample is a good example of how geographic environments can be used for sharing early maps.

One step ahead is *The Alexandria Digital Library* (2009) geographical browser. This interesting geographic approach provides tools for discovering and accessing maps. It offers a rich interface for querying the resources providing up to four different panels of search parameters. The main difference between Alexandria's interface and the Rumsey approach is that the first one comprises a single interface for accessing any map from the collections and it is possible to see more than one resource at the same time. This service is also based on Google Maps in order to provide the geographical context. A comprehensive description of the evolution of Digital Map Libraries and the most relevant online services, stressing the challenges in the design of the next generation of Virtual Map Rooms (VMR), is available in *Evolution of Digital Map Libraries towards Virtual Map Rooms: new challenges for the historical research* (Fernández-Wyttenbach, Siabato, Bernabé, & Wachowicz, 2010).

But while the Web mapping/visualization tools developed by Google and Microsoft provide very fast, easy-to-access views of images and maps, they are not suited for complex work and analyses. Nonetheless, the pervasive use of these new environments offers an opportunity for sharing data and specifically early maps. Therefore, it is essential provide users with environments like these but offering enough tools and elements for using early maps properly, not just for seeing them.

Thus, setting up robust VMR as a tool for supporting historical projects in which a large number of national and international researches and institutions are involved, represents an advance

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