

Enabling Exploration: Travelers in the Middle East Archive

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ABSTRACT

In this paper, we describe the Travelers in the Middle East Archive (TIMEA), a digital archive focused on Western explorations in the Middle East between the 18th and early 20th centuries [7]. TIMEA brings together TEI-encoded texts and digital images stored in DSpace, research and teaching materials in Connexions, and GIS maps made available online through ArcIMS. By using the functionality of three distinct systems, TIMEA enables users to more fully understand the materials, place them in context, and conduct queries. We outline the rationale for this architecture, the challenges it presents, and our approach to providing an integrated user experience.

Categories and Subject Descriptors

H.3.7 [Information Storage and Retrieval]: Digital Libraries - Collection; Dissemination; User issues.

General Terms

Design, Human Factors

Keywords

Digital library, institutional repository, cultural heritage

1. INTRODUCTION

In the nineteenth century, travelers to the Middle East created and used an important body of material that is too-little known today. An array of literary and scientific figures, like Gertrude Bell, a pioneer of archaeology, and botanist H.B. Tristram left a plethora of documents, photos, and other materials. Travelers – both actual and armchair – scrutinized stereoscope views of monuments such as the Sphinx and the Pyramids, browsed guides that detailed where and how to travel, and collected postcards that depicted diverse cultures. The Travelers in the Middle East Archive (TIMEA) makes these materials available online and provides features that enable contemporary Internet travelers to explore dynamic maps and use the materials as object lessons in how to conduct research. The project goals include enabling rich access to cultural heritage materials, promoting information literacy and

research skills, and leveraging the geographical focus of the collection through GIS maps. In building TIMEA, we have confronted a core question: how can a digital library group with limited resources provide services that go beyond typical functions? We have used existing software to support the different functions of the archive. While this strategy reduces our need for custom software, it necessitates careful consideration of how to integrate the various components.

2. TIMEA COMPONENTS

Rather than build a customized content management system that combines support for digital objects and metadata, searching and retrieval, XML publishing, GIS maps, preservation of assets, and research guides, we chose to leverage the functions of existing software: DSpace for texts and images, Connexions for contextual materials, and ArcIMS for GIS maps. In this way, we draw on existing staff expertise and, in the case of DSpace and Connexions, adopt open source tools that are extensible and support open standards. An additional motivation in integrating existing systems was to facilitate reusability of the various resources beyond the TIMEA project. For example, modules in Connexions could be used to teach different courses or support research in a range of subjects. More importantly, having these assets available for flexible reuse more readily facilitates the discovery and creation of new knowledge.

TIMEA currently provides access to a growing collection of over 400 images and approximately 15,000 pages of TEI encoded texts [6]. As the core digital repository for managing and presenting texts, images, and accompanying metadata, TIMEA uses DSpace. We selected DSpace because it is open-source, supports the OAI, offers a sound approach to long-term preservation, and is supported by Rice University's Digital Library Initiative [5]. As DSpace was designed primarily to be a repository for born-digital assets, we encountered some limitations in using it for a digitization project. We are therefore developing support for necessary functionality such as transforming XML to HTML for end user display while, as an interim solution, we present texts as HTML. In addition, the interface cannot be easily customized for each community within an institution, which might raise usability and branding problems.

TIMEA's team includes scholars who bring subject expertise, a commitment to fostering research skills, and an understanding of the cultural and historical contexts surrounding the materials. They have authored research and learning modules that address topics such as studying the political and biographical contexts informing historical materials and understanding material and

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visual culture [1]. These modules will link to materials within the archive as case studies for larger questions of research methods.

To author and make available these research modules, TIMEA uses Connexions, an open content repository and publishing environment for educational and research materials [4]. On a technical level, Connexions' advantages include its use of open standards and open source software as well as features such as weighted linking and authoring tools. Through Connexions, we hope to promote learning communities by enabling instructors at other institutions to use TIMEA modules or create new ones; Connexions' beta version provides support for community discussion and collaboration. Connexions contains more than 3,000 modules in 146 courses, but the TIMEA/Connexions partnership is unique in building modules that draw upon a separate repository of cultural heritage materials.

TIMEA demonstrates the geographical nature of its focus by using dynamic GIS maps that combine geospatial data with historical information. These maps will enable users to visualize the relationships between cultural and historical sites and phenomena such as elevation, water, and political boundaries, compare present-day data with historical views, provide search/download tools for GIS data, and act as access points for TIMEA texts. Creating the GIS maps is a complex process [2]. Data obtained from appropriate sources is refined so that boundaries are accurate and redundant names are clarified. Wherever possible, TIMEA will make available its cleaned-up data to the broader community. TIMEA uses ESRI's ArcIMS GIS server to deliver these maps online, taking advantage of team members' experience with ESRI products and the functionality of the software.

3. TOWARD A UNIFIED USER EXPERIENCE

Since we are using several systems as components of the archive, we want to ensure the overall usability of the features and the accessibility of the content. We are working to craft a common user interface, enable interlinking between GIS maps and digital objects, provide better XML support in DSpace, and offer searching across TIMEA's components. This work is informed by a series of usability tests designed to determine what scholars and students require.

To provide a more seamless visual experience of the archive, we are developing a TIMEA "skin" that will allow us to leverage the strengths of the various components in an integrated manner. Connexions provides some support for customized interfaces and we are working with the DSpace development community to provide a similar capability in DSpace.

Our goals for an integrated resource include creating the ability to move from place names in a text to locations on a map and connecting stereograph views to their corresponding location on historical maps. A basic part of the architecture is a relational database that models and contains data from the NIMA gazetteer [3] for the relevant countries. We are developing a programmatic way of identifying and tagging place names in the XML-encoded texts. The place name tags will include the ID of the place name taken from the NIMA database. Since a single name may refer to more than one feature, the user will be presented with a list of

features when she selects a place-name in a text. The user can then select the wanted feature based upon its properties (such as type of feature), which will retrieve a map showing the feature from the GIS system. The database will also enable us to implement searches by place name and by latitude/longitude. Stereograph images will be linked to geographic features by identifying place names in their Dublin Core metadata and adding the corresponding place name IDs to the metadata.

To make possible the rich display of XML encoded texts in a web browser, we are extending the functionality of DSpace to present them transformed into web pages with page image thumbnails from the source material and navigational hyperlinks.

Determining the best approach to enable searching across the archive remains a challenge. One option is to have a search aggregator tool combine search results from the different software packages; another is to use Google or something like it to generate a comprehensive combined index to search. Embracing DSpace's community development model, we are contributing enhancements back to the DSpace community where possible.

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