

With a World of Heritage So Rich

Lessons from Across the Globe for U.S. Historic Preservation in its Second 50 Years

Finding Efficiencies and Pooling Resources to Improve Federal, State, Tribal, and Local Heritage Inventory Systems

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Necessity of Inventories

For any government agency responsible for protecting cultural resources, up-to-date heritage inventories employed through modern information technologies have the potential to be their most essential tool for making proactive, timely, and informed decisions; applying preservation-related laws and policies; and for emergency preparedness and response. Conversely, without effective inventories, heritage is put at risk if government agencies lack essential information when critical decisions must be made.

Challenges

The Preserve America Summit was held a decade ago on the 40th anniversary of the passage of the National Historic Preservation Act (NHPA). In looking toward the 50th anniversary of the NHPA, one outcome of the summit was that the Advisory Council on Historic Preservation recommended as a first priority action the creation of a national “comprehensive inventory of historic properties through a multi-year plan that expands current inventories and makes them more compatible and accessible.”¹ This ambition has yet to be realized. However, this recommendation resulted in the National Historic Property Initiative (NHPI), which in 2009 published results of a nationwide survey that identified a number of challenges facing State Historic Preservation Offices (SHPOs), Tribal Historic Preservation Offices (THPOs), and Federal Preservation Offices (FPOs).² Similar challenges are commonly faced by U.S. local heritage agencies.

The development and maintenance of software systems for digital inventories is costly. However, the NHPI survey found that “SHPOs, THPOs, and FPOs typically have limited funding, if any, available to develop, implement, and maintain a DBMS [database management system].” While heritage agencies tend to be chronically underfunded, organizations in the U.S. and internationally individually make duplicative expenditures on inventory systems that often address needs that are very similar to those of other institutions.

Heritage agencies are challenged to keep up with the rapid advancement of information technologies. While organizations need to be well-informed when deciding which software applications to invest in for their inventories, the NHPI survey found that the “DBMS of SHPOs, THPOs, and FPOs are largely managed by personnel with advanced degrees in Arts and Sciences (anthropology/archeology or in architecture/history)” and that “DBMS development and management is frequently undertaken by these staff members as a collateral duty and with no formal training.” The result is that heritage agency staff too often must provide advice about

costly and long-term IT investments when they may have significant gaps in IT training and may not have the required time or background to follow IT trends.

Heritage agencies often need to share data with other government institutions. The NHPI survey found that “relatively few SHPOs, THPOs, and FPOs are capable of easily sharing historic property data in compatible formats.” Obstacles to data sharing noted in the survey included “[l]ack of adequate DBMS development, implementation, training, and funding” and “[s]oftware/technology incompatibilities/inconsistencies.” A common stumbling block impeding exchange of heritage data between agencies is the use of nonstandard and proprietary data formats.

Finding Efficiencies and Pooling Resources to Overcome Inventory Resource Constraints

International heritage organizations have had success in tackling similar challenges by taking an approach that maximizes efficiencies and enables pooling resources. Adopting an open source software³ model offers a number of advantages over proprietary software, such as being more economical, avoiding vendor lock-in, and allowing for the use of open data formats rather than proprietary formats, which in the future may no longer be supported and become obsolete. The Flanders Heritage Agency (FHA) in Belgium was an early adopter of an open source software approach for its digital heritage inventory based on these benefits. Additionally, the FHA has not needed to wait for a proprietary software company to release needed new features. Customizations and enhancements have been immediately possible.

Arches Heritage Inventory and Management System

Following this approach, an increasing number of heritage organizations around the world are implementing the Arches Heritage Inventory and Management System, an open source, geospatial software platform purpose-built to inventory all types of heritage places, including buildings, structures, archaeological sites, cultural landscapes, and districts.⁴ The Getty Conservation Institute and World Monuments Fund have jointly invested in developing Arches to address the inventory requirements of heritage organizations around the world. Arches is an enterprise-level software platform designed to be independently deployed at an organizational or project level.

Arches has been designed to address the challenges described previously while taking into account the needs of heritage organizations internationally. To this end, the design of Arches has followed key guidelines:

- *Economical*: Arches is economical to adopt, being available at no cost. It allows for pooling resources for software maintenance and enhancements.
- *Customizable*: Arches is freely available to be downloaded by heritage organizations and to be configured and customized without restrictions to meet their particular needs.
- *Standards based*:⁵ Arches incorporates internationally adopted standards for heritage inventory, semantic data modeling, controlled vocabularies and information technology. The incorporation of standards structures data for widespread interoperability and integration and to retain data viability as technology advances.
- *User friendly*: Arches is designed to be as intuitive as possible so that most users require minimal technical training.
- *Broad, controlled accessibility*: Arches is web-based to provide for broad access once installed. Access, however, can be controlled to the level of specific data-fields based on individual or group privileges. An implementer can specify which particular users may edit

which specific data fields, or what visitors (if public access is allowed) may see what types of data.

Arches has been designed to support essential heritage management activities, such as:

- resource identification
- research and analysis
- planning preservation activities
- impact assessment and monitoring (see Figure 1)
- emergency preparedness and response

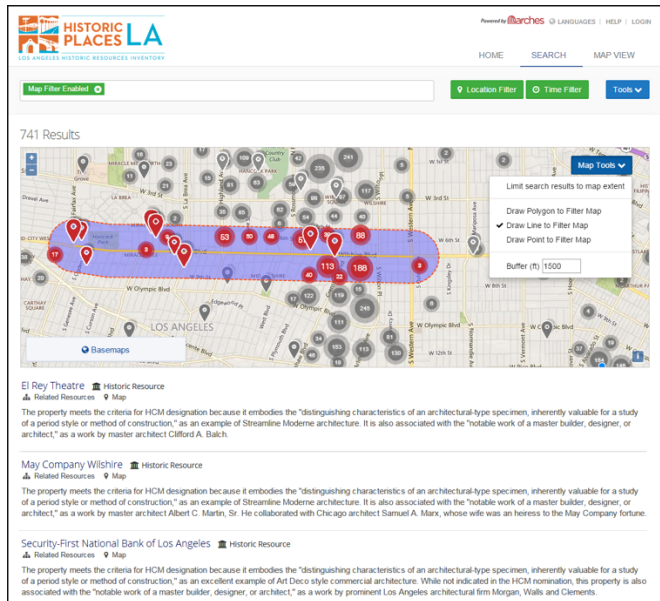


Figure 1: Using the location filter in Arches, resources that would be impacted by a proposed development project can be quickly identified (Microsoft Bing API data reprinted with permission).

Arches has also been designed to provide searchable information to the public, government authorities, and decision makers to promote their awareness and appreciation of heritage. The following are some of the organizations and projects that have implemented Arches to date outside the U.S.:

- The Bhutan Division for the Conservation of Heritage Sites (DCHS) has implemented Arches to create a new national digital heritage inventory. The DCHS is now entering data into the system before it is publicly launched online.
- Arches has been implemented as the *Philippine Heritage Map* by a Manila-based nonprofit to publish online information collected through an ongoing national heritage survey of the Philippines (see Figure 2).⁶ National agencies are now examining the potential adoption of this system as the nation's official heritage inventory.
- The Endangered Archaeology in the Middle East and North Africa project at Oxford University is using Arches to record archaeological sites and landscapes under threat in 20 countries across the Middle East and North Africa (see Figure 3).



Figure 2: Screenshot of the Philippine Heritage Map (Microsoft Bing API data reprinted with permission).

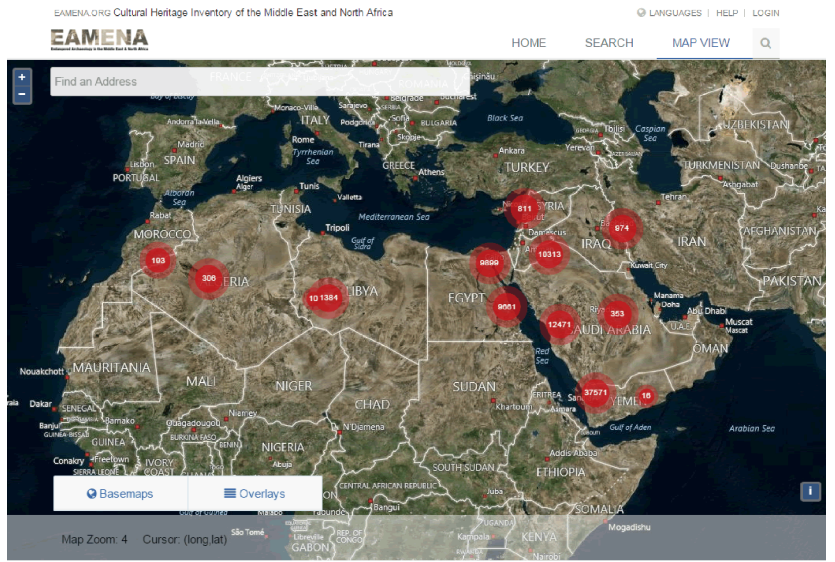


Figure 3: Screenshot of the Endangered Archaeology implementation of Arches (Microsoft Bing API data reprinted with permission).

Historic England is moving forward with implementing Arches to serve as the official inventory of the Greater London region, and the City of Lincoln, England, is deploying Arches as its municipal inventory system. Arches implementations are also under preparation for national inventories in Asia and the Caribbean, and for an inventory of ancient sites across Egypt.

The following are additional noteworthy Arches implementations to date within the U.S.:

- The City of Los Angeles, has deployed Arches as *HistoricPlacesLA*, the official Los Angeles Historic Resources Inventory, to serve both as a tool to fulfill its obligations under federal, state, and local historic preservation laws and to make information publicly accessible.⁷
- Queen Anne’s County, Maryland, has implemented Arches to present and help preserve more than 300 years of its history of significant individuals, properties, and events. This deployment is expected to go public in spring 2017.
- The Cane River National Heritage Area, Louisiana, has implemented Arches as the *Cane River Heritage Inventory and Map* to both manage information on heritage resources and to promote public knowledge, appreciation, and interest in those resources.⁸
- The American Schools of Oriental Research (ASOR) is using Arches in its collaboration with the U.S. Department of State to document damage, share information, and plan

emergency and post-war responses to the war-torn heritage of Syria and areas of Islamic State activity within Iraq.

An Arches implementation is also being finalized for the historic campus of the Armed Forces Retirement Home in Washington, DC.

Through Arches, the GCI and WMF ultimately aim to help break the cycle of heritage organizations expending scarce resources on duplicative expenditures to independently create digital inventory systems. The Arches open source license obligates those who enhance the software to share those improvements with the entire community. The open source approach ultimately enables pooling resources to provide both a greater combined investment to create a more robust inventory system as well as all around cost savings. The net result is a state-of-the-art inventory platform available to all organizations, which can make marginal investments to tailor it to meet their particular requirements. This saves precious resources for the higher aim of heritage protection.

Recommendations

Given the long-term trend of diminishing resources for heritage agencies across the U.S., the time is ripe for exploring new approaches to overcoming the challenges they face in creating and maintaining effective heritage inventory systems. International institutions have successfully adopted an open source software approach to gain new efficiencies and enable pooling resources. It is recommended that U.S. heritage organizations thoroughly investigate the advantages offered through an open source approach to digital heritage inventories, including through implementations of the Arches platform. Benefit may be found in implementing the Arches platform by a range of types of government agencies in the U.S. (e.g., federal, SHPO, THPO) to demonstrate to peer agencies how this approach offers significant advantages. This should be readily achievable given that deployments of Arches within the U.S. have already enhanced the software code to account for U.S. federal standards and guidelines.



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¹ Advisory Council on Historic Preservation. 2007. *The Preserve America Summit: Charting a Future Course for the National Historic Preservation Program: Findings and Recommendations of the Advisory Council On Historic Preservation*, available at: http://www.preserveamerica.gov/docs/Summit_Report_full_LR.pdf (accessed 13 June 2016).

² SWCA Environmental Consultants. 2009. *National Historic Property Inventory Initiative: Building Capacity to Preserve and Protect Our Cultural Heritage*, available at: https://www.nps.gov/nr/publications/guidance/NHPPII_Final_NPS.pdf (accessed 13 June 2016).

³ *Open source* refers to a computer program made available free of charge to the general public and its source programming code open and accessible, which means that its original design may be modified. Customizations, upgrades, or improvements made to the software by anyone must remain freely available. *Open source* software has an entirely different meaning than *open data*. *Open data* refers to the notion that certain data should be freely available to anyone to use and republish as they desire without restrictions by copyright, patents or other means of control. Implementers of open source software systems may choose to have data be openly available, closed (i.e., available to only a certain group of authorized system users), or a combination of the two.

⁴ For more information on Arches, visit the project website (<http://archesproject.org/>), where along with participating in the community forum visitors can interact with an online demonstration version, download the software code, access documentation, view the project roadmap, and receive project updates.

⁵ The design of Arches helps to ensure that data created through the system is in compliance with the U.S. federal Open Data Policy, including that data is software platform independent (i.e., non-proprietary), machine readable, and self-described (i.e., Arches automatically creates metadata describing system data following ISO 21127:2014). For additional information on the range of standards incorporated in Arches, see: <http://archesproject.org/standards/> (accessed 13 June 2016).

⁶ The Philippine Heritage Map is accessible at: <http://www.philippineheritagemap.org/> (accessed 13 June 2016).

⁷ *HistoricPlacesLA*, the Los Angeles Historic Resources Inventory, is accessible at: <http://historicplacesla.org/> (accessed 13 June 2016).

⁸ The *Cane River Heritage Inventory and Map* is accessible at: <http://crhim.canerivernha.org/> (accessed 13 June 2016).