Sharing Data, Swapping Knowledge, and Building Community: Moving Archaeology from Deep Storage into the Public Eye through the Internet

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Abstract

The state of Vermont, a small rural geography in the northeastern corner of the United States, has created a new Internet-based archaeology museum to increase public awareness of archaeological knowledge and to change archaeologists' current ways of collecting, storing, accessing, communicating, and thinking about archaeological site information. The Vermont Division for Historic Preservation was awarded a National Endowment for the Humanities Digital Start-up Grant in the fall of 2008 to create a prototype for a sustainable virtual museum that leads the way for other states and organizations to use similar concepts and application. The Vermont Archaeology Museum uses the Drupal content management system, a powerful open-source tool empowering archaeologists and other invited "curators" to create museum exhibits on the fly with minimal training and inviting visitors to actively participate in the museum community.

1   INTRODUCTION

The State of Vermont seeks to change how archaeologists collect, create, store, access, communicate, and think about archaeological site information through creation of its Internet-based Vermont Archaeology museum. This initiative was first presented at the 2009 CAA session on *The New ICOMOS Ename Charter (2008) on the Interpretation and Presentation of Cultural Heritage Sites: What Impact Can Digital Technologies* Really *Have on Public Heritage?* The Ename Charter puts out important principles and objectives readily embraced by most heritage professionals. The charter lists seven principles that should underlie heritage, and certainly archaeological, work: access and understanding, information sources, attention to setting and context, preserving authenticity, planning for sustainability, concern for inclusiveness, and the importance of research, training and evaluation.[1] Through an Internet-based archaeology museum, the Vermont Division for Historic Preservation (VTDHP) aims to improve access to and understanding of archeological heritage resources and to create a dynamic new tool for data sharing and communication among assorted communities. VTDHP's particular vision of this virtual archaeology museum meshes elegantly with the Ename principles. In response to the session's question—*What Impact Can Digital Technologies* Really *Have on Public Heritage?*—the answer is that digital technologies, through efforts such as Vermont's, can and do have an enormously beneficial and transformative impact on heritage in countless ways.

The VTDHP was awarded a National Endowment for the Humanities Digital Start-up Grant in 2008 to create a prototype for a sustainable Internet-based Vermont archaeology museum that paves the way for other states and organizations to use a similar, or the same, framework or application. Fueled by federal and state laws, American archaeologists conduct dozens of archaeological studies daily, discovering many important sites each year. The collected artifacts and other data sets disappear into boxes; information and interpretations languish in unpublished technical reports. Important stories about our ancient and more recent past that may be relevant to climate change, sustainability, human adaptations, food production, major and minor global issues, today's social studies class, or our neighbor are not shared with communities within which the sites are located, nor with landowners, Indigenous and other descendent communities, educators, students, and other individuals and organizations who make decisions about the future of archaeological sites. Important data are shared with other scholars but infrequently, informally, when time permits, and sometimes only when someone asks. The little information that is disseminated comes from one direction: the archaeologist as "expert" and "proprietor" of the information. Currently there is no place and no way in the standard archaeology enterprise for non-archaeological voices and points of view.

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[1] Ename Charter, www.enamecharter.org/.

2 CULTURAL RESOURCE MANAGEMENT ARCHAEOLOGY IN THE UNITED STATES

Federal government attention to archaeology began in 1906 with the American Antiquities Act,[1] followed in 1935 with the Historic Sites Act. America's great depression in the 1930s provided stimulus funding to archaeology, putting hundreds of archaeologists and thousands of laborers to work. Jameson's[2] detailed summary of public archaeology in the United States offers an excellent overview of the United States government's role in producing massive amounts of archaeological information and accompanying collections over a century of investigations. The federal legislation[3] that came to drive American archaeology surged with Section 106 of the 1966 National Historic Preservation Act (Public Law 89-665 and its numerous amendments). This short paragraph in US law conveys a great deal of information: "The head of any Federal agency having direct or indirect jurisdiction over a proposed Federal or federally assisted undertaking in any State and the Head of any Federal department or independent agency having authority to License any undertaking shall, prior to the approval of the expenditure of any Federal funds on the undertaking or prior to the issuance of any license, as the case may be, take into account the effect of the undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register. The head of any such Federal agency shall afford the Advisory Council on Historic Preservation established under Title II of this Act a reasonable opportunity to comment with regard to such undertaking."[4] This paragraph, with its attendant amendments, revolutionized the conduct of archaeology in the United States. In particular, its accompanying regulations at 36 CFR Part 800, "Protection of Cultural Properties,"[5] which gives explicit directives to "identify historic properties" and consider the effects of "undertakings" on such properties, created a thriving and lucrative business of archaeology in the United States. This entire new way of doing archaeology became known as "cultural resource management."[6]

Jameson[7] lists the resultant crisis-level challenges that archaeological program managers across the nation, including the author, struggle with daily: protection of sites and storage and curation of artifact and data collections, among others.

Since the mid-1970s the vast majority of archaeological investigations in the United States have resulted from compliance with Section 106 and other federal and state laws that require archaeological reviews of "undertakings" prior to project development. Unsystematic research by the author[8] suggests that more than 90% of the archaeology done in each of the 50 states is due to compliance with federal and state laws. In some states as much as 98–99% of archaeology comprises cultural resource management archaeology. As stated in 36 CFR Part 800, "'Undertaking' means a project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency, including those carried out by or on behalf of a Federal agency; those carried out with Federal financial assistance; and those requiring a Federal permit, license or approval."[9] This long sentence translates into thousands upon thousands of archaeological investi-gations across the nation over the last forty years, with developments ranging from new highways to transmission lines, malls to residential sub-divisions, bike paths to sewer lines, and many other types of activities. Section 106 in particular but also a multitude of other laws[10] have created fantastic opportunities for thousands of archaeological con-tractors and consultants and resulted in the discovery of thousands of sites. These four decades of fast and furious archaeology have created a vast storehouse of cultural and environmental information pumped out in unpublished technical reports that disappear into the fifty State Preservation offices, local and regional offices of federal agencies, state government offices, and elsewhere. As is reflected in the title of Paul

[1]Charles Robert McGimsey, *Public Archaeology (*New York: Seminar Press, 1972); National Park Service, www.nps.gov/history/history /hisnps/ NPSHistory/antiq.htm.

[2] John H. Jameson, Jr., "Public Archaeology in the United States," In *Public Archaeology*, ed. Nick Merriman (London: Routledge, 2004), 21–58.

[3]National Park Service, www.nps.gov/history/laws.htm#musm.

[4] Advisory Council on Historic Preservation, www. achp. gov/docs/nhpa%202008-final.pdf.

[5]Advisory Council on Historic Preservation, www. achp.gov/work106.html.

[6]Thomas F. King, *Cultural Resource Laws and Practice* (Walnut Creek, CA.: Altamira Press, 2002); Thomas F. King,

Our Unprotected Heritage. Whitewashing the Destruction of Our Cultural and Natural Environment (Walnut Creek, CA.: Altamira Press, 2009); William D. Lipe and Alexander J. Lindsay, Jr., eds., *Proceedings of the 1974 Cultural Resource Management Conference, Denver, Colorado* (Flagstaff, AZ: The Northern Arizona Society of Science and Art, Inc., 1974); Charles Robert McGimsey, *Public Archaeology (*New York: Seminar Press, 1972); Thomas W. Neumann and Robert M. Sanford, *Cultural Resources Archaeology. An Introduction* (Walnut Creek, CA.: Altamira Press, 2001).

[7]John H. Jameson, Jr., "Public Archaeology in the United States," in *Public Archaeology*, ed. Nick Merriman (London: Routledge, 2004) 38–42.

[8]Giovanna Peebles, "Public or Perish," paper presented at the 72nd annual meeting of th Society for American Archaeology, Austin, Texas, April 2007.

[9]Advisory Council on Historic Preservation, www. achp.gov/regs-rev04.pdf.

[10]National Park Service, www.nps.gov/history/laws.htm#musm.

Backhouse's article[1] on the British situation, American archaeology too is "drowning in data." These stories of our past literally vanish into filing cabinets and shelves only to be mined by diligent scholars and contractors who search out these many offices and other repositories in the quest for necessary information. To ensure that the public benefits from these investigations, mostly but not always publicly funded, some states encourage and the state of Vermont strongly encourages, and requires whenever possible, public education and outreach.[2] State Archaeology Weeks or Months,[3] non-technical publications, public lectures, site tours, occasional brief summaries on the Internet, and community-participatory projects bring the results of some of this research to the general public.[4] Organizations such as the Society for American Archaeology and the Society for Historical Archaeology, federal and state government archaeologists, and "public archaeologists" (who are often government archaeologists), are at the forefront of public education initiatives across the land. As important as they are, such educational efforts are limited in who they reach and reveal only a tiny bit of the available archaeological information. They generally offer a one-way information flow, i.e. straightforward content and do not reach deep into America's myriad communities, except for the few initiatives at a project-specific level, such as the Levi Jordan Plantation,[5] the Lake Champlain Voyages of Discovery: Bringing History Home project,[6] and others. While public education efforts in cultural resource management archaeology have greatly expanded in the last two decades, [7] they have not gone far enough.[8] Nearly every

every archaeologist would agree with Jameson's statement that "because the archaeological record represents the heritage of all people, archaeologists have the responsibility to communicate with the public about the nature of archaeological research and explain the importance and relevance of archaeological resources."[9] resources."[9] But putting that into meaningful practice is challenging in the face of time, scheduling, staffing, funding constraints, and client pressure.

It was inevitable that the volume, nature, and quality of cultural resource management archaeology would create a variety of significant and thorny problems continually looking for resolution. Among these, conflicts with descendent communities; massive collections of stored artifacts, other materials, and records; access to the data and what was learned; relationships and communication with a variety of stakeholders; methodological concerns; and theoretical issues are perhaps the primary concerns, but certainly not the only ones, grappled with at conferences, offices, and in the literature.[10]

The cultural resource management environment is not conducive to innovation, although it should be. A cursory review of past proceedings of the Computer Applications and Quantitative Methods in Archaeology and the Society for American Archaeology conference abstracts confirms that while a few of America's cultural resource management practitioners are very

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[1]Paul Backhouse, "Drowning in Data? Digital Data in a British Contracting Unit," in *Digital Archaeology. Bridging Method and Theory*, ed. Thomas L. Evans and Patrick Daly (London: Routledge, 2006) 50–58.

[2] Giovanna Peebles, "Public or Perish," paper presented at the 72nd annual meeting of the Society for American Archaeology, Austin, Texas, April 2007.

[3]Society for American Archaeology, www.saa.org/ ForthePublic/NewsEvents/ArchaeologyWeeksMonths/Archae ologyWeekMonthbyState/tabid/143/Default.aspx; National Park Service, www.nps.gov/archaeology/PUBS/TECHBR/ TCHBRF15.HTM.

[4]Karolyn E. Smardz Frost, "Archaeology and Public Education in North America: View from the Beginning of the Millennium," In *Public Archaeology*, ed. Nick Merriman (London: Routledge, 2004) 59–84.

[5]Levi Jordan Plantation Project, www.webarchaeo logy.com/html/Default.htm.

[6]VT Division for Historic Preservation, Lake Champlain Voyages of Discovery: Bringing History Home, www.historic vermont.org/lakechamplain voyages.

[7]John H. Jameson, Jr., ed., *Presenting Archaeology to the Public. Digging for Truths* (Walnut Creek, CA.: Altamira

Press, 1997); Barbara J. Little and Paul A. Shackel, eds., *Archaeology as a Tool of Civic Engagement* (Lanham, MD: Altamira Press, 2007); Nick Merriman, ed., *Public Archaeology* (London: Routledge, 2004); Karolyn Smardz and Shelley J. Smith, eds., *The Archaeology Education Handbook. Sharing the Past with Kids* (Walnut Creek, CA: Altamira Press, 2000); Karolyn E. Smardz Frost, "Archaeology and Public Education in North America: View from the Beginning of the Millennium," in *Public Archaeology*, ed. Nick Merriman (London: Routledge, 2004) 59–84; Society for American Archaeology, www.saa.org/ForthePublic/Resour ces/tabid/78/Default.aspx.

[8]Giovanna Peebles, "Public or Perish", paper presented at the 72nd annual meeting of the Society for American Archaeology, Austin, Texas, April 2007; Jeremy Sabloff, "Communication and the Future of American Archaeology," *American Anthropologist* 100 (1998): 869–875; Jeremy A. Sabloff, *Archaeology Matters. Action Archaeology in the Modern World* (Walnut Creek, CA: Altamira Press, 2008); Society for American Archaeology, *Exploring Public Perceptions and Attitudes about Archaeology*, prepared by Maria Ramos David Duganne, Harris Interactive, Inc. February 2000, www.saa.org/Portals/0/SAA/pubedu/nrptdraft4.pdf.

[9]John H. Jameson, Jr., "Purveyors of the Past: Education and Outreach as Ethical Imperatives in Archaeology," in *Ethical Issues in Archaeology*, ed. Larry J. Zimmerman, Karen D. Vitelli, and Julie Hollowell-Zimmer (Walnut Creek, CA: Altamira Press, 2003) 154.

[10]See Larry J. Zimmerman, Karen D. Vitelli, and Julie Hollowell-Zimmer, eds., *Ethical Issues in Archaeology* (Walnut Creek, CA: Altamira Press, 2003).

innovative, as a community they are not the digital innovators. Doing archaeology on tight time frames, with limited scopes of work, always watching the cost, and working for clients who only want a "green light" encourages "business as usual." Backhouse[1] aptly notes that "Contract and rescue archaeology are reactionary in their nature. Lead times are tight, preparation can be limited and long term planning can be nigh impossible….As a result of these particular sets of circumstances, the first elements of the business to be forgotten are forward planning and investment in training. This has meant that it is usually faster, and always safer, to rely on old methods rather than invest in what, in the long term, would be a more rapid and efficient method." Curiously, but not surprisingly, government agencies often fall into similar thinking. Backhouse's article[2] also illustrates that many cultural resource management problems in the United States are mirrored in the United Kingdom. One exception to the tenacious hold of out-dated methodologies and technologies is use of Geographic Information Systems (GIS) applications.[3] But even that has been slow to gain gain ground, usually propelled forward by one large contract that allows a cultural resource management organization to purchase a license, typically for a single user, and do enough GIS to become good at it. Only then does it become integrated into the day-to-day methodology of the enterprise. Many small firms in the United States still do not use GIS. Forte and Siliotti's[4] handsome and pioneering volume on virtual archaeology, published more than two decades ago, showcases the power of 3D visualization, computer simulations, and reconstructions to enhance peoples' understanding of the past. This marvelous book does not illustrate a single site found in an American cultural resource management context, reminding us of another significant obstacle to technological innovation in the cultural resource management world. Cultural resource management archaeology requires investigations of many specific areas, resulting in discoveries of many sites, but in most cases very limited time and study is spent on each site. When a site is known on the basis of five or twelve test pits, each fifty by fifty centimeters square, in which handfuls of waste flakes from tool making and, maybe, one whole tool is found, creating a 3D reconstruction of that site is impossible. The cultural resource management environment is further handicapped by an absence of long-term partnerships with other organizations that could stimulate and facilitate technical innovation and projects. In fact, where cultural resource management organizations are

embedded in a university we may see heightened technological advances, for example, the Center for Advanced Spatial Technologies at the University of Arkansas at http://cast.uark.edu/home.html. Unfortunately, that is often not the case and opportunities for technical and creative brainstorming are missed, probably because archaeologists are too busy satisfying the immediate needs of their clients and struggling to stay in the business of archaeology.

The state of Vermont, in the northeastern corner of the United States, suffers from very cold and very long winters, sometimes lasting for six months, but this climate did not impede development of an extraordinary archaeological patrimony spanning twelve thousand years of Indigenous and four hundred years of Euro-American history. As the State Archaeologist for Vermont it was apparent to the author that many of these problems had come to a head in her corner of America. Cultural resource management archaeology comprises 99% of the archaeology conducted in Vermont. The author has been investigating and pushing ways to accelerate public access to archaeological information in Vermont for many years. Creation of the unstaffed Vermont Archaeology Heritage Center in the fall of 2006 served as catalyst for figuring out how to best inform the public about the thousands of artifacts and records now stored in over 1,100 boxes and the stories they tell. One half of the state's archaeological collections are stored at the Vermont Archaeology Heritage Center; the University of Vermont stores the other half.

Various factors created the need to reinvent a way to store and communicate information gathered by Vermont's cultural resource management archaeological organizations:

- the convergence of a vast quantity of collection boxes and records;
- lack of access to that information by scholars, Indigenous and agencies (who paid for the accumulation of that well-hidden information), and the public, among others;
- lack of engagement among archaeologists, their information, and the multiple communities who are linked to the archaeological sites and interpretations;
- an urgent need to move us from a paper world into the digital environment of the twenty-first century; and
- a pressing need to expand ways of communicating and making the past relevant to the present and future.

The author also wanted to address a number of other issues and challenges in her state, most of which are common to other states. Some of these challenges are embedded in the Ename Charter principles. How do we provide public "access" to privately owned sites in a state in which 94% of the land is privately owned? How do we access sites that are unsafe, such as the teetering ruins of a blast furnace, or a nationally important historic industrial mining site and landscape that have

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[1] Paul Backhouse (p. 300 n1) 50.

[2] Paul Backhouse (p. 300 n1) 50–58.

[3] Gary Lock, *Using Computers in Archaeology. Towards Virtual Pasts* (London: Routledge, 2003).

[4] Maurizio Forte and Alberto Siliotti, eds., *Virtual Archaeology: Great Discoveries Brought to Life Through Virtual Reality* (London: Thames and Hudson, 1996).

been designated a Superfund Site by the United States Environmental Protection Agency? How do we provide public "access" to sites that no longer exist, that have been destroyed by development, and only survive as data in boxes and records? How do we interpret sites when so many are "invisible" and buried under the surface of the ground (figure 1)?

Figure 1. *Location of a pre-Contact Native American camp site hidden under the ground surface, Milton, Vermont.*

Thousands of years of settlement may lie in a corn field or woodland but who knows it? How do we engage various communities (landowners, town leaders, descendent communities, local historians and scientists, teachers and students, others) who often have a great deal of knowledge and ideas about sites and landscapes past and present? How do scholars access each other's data? How do we meet our curatorial responsibilities to irreplaceable archaeological collections?[1] How do we create a vehicle through which other voices and other points of view can enrich, or alter, the archaeologist's interpretation?[2] How do we help non-museum archaeologists, the ones who excavate the sites and recover objects and other data, play a continuing role in the objects' care and management long after they are finished with their analyses? How do we create a sustainable, low cost environment that addresses these imperatives? Archaeologists control how much data is put out there and actually very little information gets out. Thus, by acting as "wise men" or guardians of the past, archaeologists inadvertently have handicapped the very outcome that many of us wished for the most, which is contemporary stewardship and understanding of our past.

3   VIRTUAL MUSEUMS

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[1]S. Terry Childs, ed., *Our Collective Responsibility: The Ethics and Practice of Archaeological Collections Stewardship* (Society for American Archaeology: Washington, DC, 2004).

[2]Ian Hodder, "Archaeological Reflexivity and the 'Local' Voice," *Anthropological Quarterly* 76 (1) (2003): 55–69.

Tim Berners-Lee,[3] inventor of the World Wide Web, dreamed that "people-to-people communication through shared knowledge must be possible for groups of all sizes, interacting electronically with as much ease as they do now in person." This vision speaks to the power of the Internet to help solve a variety of the problems noted above. An Internet-based virtual archaeology "museum" suggested the powerful solution that could meet our practical and social needs as well as ethical responsibilities to the archaeological record and to diverse publics.[4] The word "museum" is loaded with meanings and preconceptions; discussion can fill an article all by itself. For purposes of this narrative, pioneering and forward-thinking nineteenth-century museum director John Cotton Dana's vision in 1917 of what a great museum should look like is very close to what we aspire to: "A great city department store of the first class is perhaps more like a good museum of art than are any of the museums we have yet established. It is centrally located; it is easily reached; it is open to all at all the hours when patrons wish to visit it; it receives all courteously and gives information freely; it displays its most attractive and interesting objects and shows countless others on request; its collections are classified according to the knowledge and needs of its patrons; it is well lighted; it has convenient and inexpensive rest rooms; it supplies guides free of charge; it advertizes itself widely and continuously; and it changes exhibits to meet daily changes in subjects of interest, changes of taste in art, and the progress of invention and discovery."[5] The Vermont virtual archaeology museum is the place where Dana's vision hooks up to the Internet. Using a different set of words, easy data management, convenient data access, worthwhile education, lively entertainment, rich research and scholarship, free of charge, social networking, and relevant and flexible "programming" can come together in the museum.

The Internet hosts many archaeology, anthropology, art, science, and humanities virtual museums and digital libraries. Most heritage web sites are unique proprietary applications designed for a specific archeological site or assemblage of collections; other organizations are developing and using open source applications for sharing and imitation, for example, Omeka[6] and the Alexandria Archive Institute.[7] The author is currently researching and evaluating virtual museums and

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[3]Tim Berners-Lee, *Weaving the Web* (London: Orion Business Books, 1999) 169.

[4]Larry J. Zimmerman, et al. (p. 300 n10) xi-xvi.

[5]Gail Anderson, ed., *Reinventing the Museum. Historical and Contemporary Perspectives on the Paradigm Shift* (Walnut Creek, CA: Altamira Press, 2004).

[6]Omeka, http://omeka.org/about/.

[7]Alexandria Archive Institute, www.alexandriaarchive.org/.

heritage web sites around the globe as part of a larger study associated with the development of Vermont's museum. Several especially interesting examples of dynamic virtual museums include the Virtual Museum of Canada[1] and the French government's Great Archaeological Sites.[2] The Canadian site is of particular relevance to this project since it provides a portal for hundreds of heritage organizations to create and share "exhibits."

The Virtual Museum of Canada is staying current with available social networking tools, allowing visitors to bookmark and share information. These popular and ubiquitous features are generally absent in many heritage sites.

The Heilbrunn Timeline of World Art in the Metropolitan Museum of Art web site[3] allows visitors to to view artifacts and collections by selecting a place, time or theme. The timeline feature is wonderfully executed. Virtual museums such as these cost hundreds of thousands of dollars to develop and require sustained efforts by dedicated web staff to keep them going. These are exciting times for creating new web sites, since the pioneers have created foundations for the rest of us to build on.

4   THE VERMONT VIRTUAL ARCHAEOLOGY MUSEUM PROJECT

With $ 25,000 in funding from the National Endowment for the Humanities Digital Start-up Program, the VTDHP initiated development of the Vermont prototype virtual museum project in late May 2009. The preliminary concept envisioned a museum with many rooms populated by different archaeologists with all the many data sets they collected. The museum will transform the typical cultural resource management archaeological investigation "end products"—an unpublished technical paper report and one or more boxes full of artifacts and other data—into individual "exhibits" offering a rich mix of information about one site or a group of sites. Exhibits will contain as many of these information sets as possible: various levels of GIS spatial data (if not sensitive); photos and interpretations of the site, artifacts, cultural features, and other data; associated artifact databases and field and laboratory records; non-technical site summaries; historic maps; archival documents; unpublished and published reports and articles; video footage; and other information and links.

The museum allows archaeologists to tell first-person stories about their discoveries, solicit contributions by scholars in other disciplines, invite Indigenous people and other community members to write their own stories and interpretations about the archaeological sites, artifacts, and landscapes, and provide opportunities for community members and others to comment and participate. Museum "visitors" can choose a particular time period of interest, a theme (for example, "Paleo-Indians" or "copper mining"), or geography, such as a town or watershed (ancient people focused on watersheds, but it also links the visitor to modern day concerns with watershed planning and water issues). Visitors can explore whatever level of information that suits them, staying shallow or going deep. The museum will serve as a piazza where multiple communities interact: archaeologists, Native Americans, teachers, students, other scholars, interested landowners, people who live within the community where a site is located, and others.

5   PROTOTYPE DEVELOPMENT

Sustaining Vermont's virtual museum with no staff and no funding requires creating a system with no licensing costs, minimal maintenance needs, and a high level of self-sustainability. The VTDHP had three basic requirements from the inception of the project: individual archaeologists and organizations, outside of the VTDHP government organization, had to be able to easily create the museum's "exhibits"; the museum had to be built using open source applications; and the museum had to be replicable by others. Subsequent to the author's submittal of the NEH grant application in the spring of 2008, the State of Vermont coincidentally determined that all state web sites be built with the Drupal[4] content management system and framework as an integrated part of the State of Vermont web portal. Drupal was chosen by Vermont as an effective tool for empowering non-technical state employees to populate and revise web sites on the fly with minimal training.[5]

The Vermont virtual museum project, directed and managed by the author, includes project advisors Professor Elizabeth Chilton, Associate Professor and Chair, Department of Anthropology, University of Massachusetts, Amherst; Dr. David Pollack, University of Kentucky and former Director of the Kentucky Archaeological Survey and Site Protection Program Manager, Kentucky Heritage Commission; Dean Mara Saule, Dean of Libraries and Learning Resources, University of Vermont, and Director of the University of Vermont Libraries' Center for Digital Initiatives; and an advisory committee comprised of educators, experts in collections, archaeology, and technology, and interested citizens.

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[1]The Virtual Museum of Canada, http://www.musee virtuel-virtualmuseum.ca/index-eng.jsp.

[2]Great Archaeological Sites, www.culture.gouv.fr/culture/arc nat/en/index.html.

[3]Metropolitan Museum of Art, www.metmuseum.org/toah/ ?HomePageLink=toah_l.

[4]Drupal, http://drupal.org/about.

[5]Wikipedia, Drupal, http://en.wikipedia.org/wiki/Drupal.

The Emergent Media Center (EMC) at Champlain College, Winooski, Vermont,[1] was chosen as the project's technical developer. The EMC is keenly interested in working with the State of Vermont in transforming Vermont archaeology through creative technology. In close collaboration with the author, the EMC developed the concept document, project requirements, the final proof of concept, and the prototype application. The prototype application was built in Drupal 6.12 using various core modules and MySQL database. Drupal allows for easy development of social networking such as creating user profiles, friends lists, favorites, comments, sharing of information, and so forth.

Figure 2. *Prototype Vermont Archaeology Museum, home page.*

The prototype Vermont Archaeology Museum at http://emergentmediacenter.com/vtarch/ (fig. 2) contains a number of "sample" exhibits created using excerpts from existing archaeology publications or written on the spot by the State Archaeologist. Built in four weeks after concept approval, the prototype application contains core desired features and functionality but various ideas, such as an explorable dynamic timeline and "featured artifacts," did not get implemented in the available time.

Visitors to the museum can view exhibits and explore various levels of information. The museum site's full functionality as a community social network takes place once a visitor registers and logs in. At that point a visitor fully participates in the museum community by creating a user profile, tagging and sharing favorite exhibits, adding comments to specific exhibits, and adding content by attaching a video, photos, links, or an article. Thus, if an archaeologist is investigating a nineteenth century homestead site in a village, a community member can provide her knowledge of the place by commenting on the exhibit and can add scanned pages from a family diary describing the family that lived at the site and their activities. That person's

daughter may post old photos of the family. In another example, a local teacher uses several exhibits in his history class to teach about changes in technology. He creates a class museum "group" in which they discuss ideas, ask archaeologists some questions, and post their class project papers when finished.

Archaeologists, as the exhibit "curators," have a more priviledged level of access when they register, opening up the edit feature and creating exhibits. Special guest "curators" may also be given that higher level of access to create a special exhibit. The Vermont State Archaeologist (currently the author) serves as museum "director." A museum advisory board to help the site run smoothly may be created as well as a system of volunteer moderators to ensure daily activity. The prototype will be tested and revised in early fall of 2009. Hundreds of users will test and evaluate the site and respond to a survey questionnaire; the project's advisors will evaluate the application and project results.

The Vermont virtual archaeology museum project does not offer cutting-edge technology. Instead it uses readily available technologies in innovative ways to improve how archaeologists communicate archaeology and how non-archaeologists participate in that dialogue. A significant innovation, in fact, a revolutionary idea based on this author's research of heritage web sites and virtual museums, involves the key role of individual archaeologists who, after quick training in the application, will create up-to-date exhibits based on their investigations and research from their own desks. Scholars both near and far across disciplines will have rapid access to current research and data sets. Archaeologists can also create exhibits about prospective investigations, putting research designs out for public review and comment and informing community members and other scholars as the study progresses. Perhaps the archaeologist has a question about a particular artifact or feature or interpretation— she can pose the question to the world at large through the virtual museum. Standard templates help the archaeologists enter information. Template headings "What's the story?", "What's the site?", and "What did we learn?" force archaeologists to write and think differently about their sites. VTDHP hopes the museum structure will facilitate a paradigm shift in how archaeologists think about the information they collect during the time they are collecting it and even before they start collecting it. The museum may also promote a different and long-term relationship with archaeological materials rather than terminating their relationship at the conclusion of a project when everything gets boxed up and shipped off to become someone else's problem. Long term ideas include using the Vermont Archaeology Museum as the Internet-based data entry portal and storage area for all Vermont archaeological data once archaeologists agree to standardized data formats. Archaeologists in the field could enter data

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[1]Emergent Media Center, www.champlain.edu/Emergent-Media-Center.html.

right into the Museum portal and immediately make it accessible to their colleagues or other scholars.

The museum will also invite dialogues about archaeological, historic, and cultural knowledge between archaeologists and different communities.

The State Archaeologist's position will serve as promoter, gatekeeper, tutor, cheer leader, and enforcer of the system. Archaeologists will be strongly encouraged, and when possible required, to create exhibits with the results of their investigations. Because most of Vermont's archaeological studies are publicly funded with federal or state monies, the State Archaeologist can recommend to federal and state agencies that they require their consultants to create exhibits for the virtual museum as a contractual obligation. Under Section 106 of the National Historic Preservation Act, undertakings that result in adverse effects to significant archaeological sites result in Memoranda of Agreement; stipulations can require creating an exhibit for the virtual museum.

Naiveness and optimism are sometimes useful traits when embarking on an ambitious, complex project that requires collaboration by a community of archaeologists and when aspirations are high. And of course the "devil is in the details." McDavid[1] offers useful critical insights and advice on the proposed interactive aspects of the virtual museum from her own extensive experience with the Levi Jordan Plantation Internet site[2]; she highlights that active "participation" occurs in a variety of ways. Thus, working with a community to create a "special exhibit" for the museum or a specific grouping of content about the community may engage those folks more than the act of participating in a web site commentary exchange. Indeed, many Vermonters in rural communities either have no Internet access or, if they have it, it's slow dial-up.

The world of the virtual museum will not always be pleasant or easy: McDavid[3] warns of "pseudo-archaeologies" commandeering web discussions and requiring honest and serious engagement "in conversations with people with whom we disagree." We are going to have to learn to disagree without being disagreeable. Indeed, we will get comments and questions from artifact collectors, metal detectors, true believers of unsupported theories who never give up,[4] and others that challenge us to remain polite and engaged in time-consuming dialogues. People are interested in their own stories; history and the past are ultimately personal and engagement will happen there. "Relevance" has more to do with linking science and archeological interpretation and history to one's own life than the actual "facts" of archaeology. That is our challenge as archaeologists and the virtual museum can help us with this. But that interface between our work as archaeologists and eliciting and engaging in personal conversations will involve a lot of effort. Vermont's virtual archaeology museum will demand energy, patience, curiosity, trust, and appreciation that other people's opinions count. It's O.K. to allow, and even encourage, others to provide some of the answers. Sometimes the answers to peoples' questions will come from Indigenous people, local historians, community elders, and others, and not from the archaeologists.

The Vermont Archaeology Museum project is creating a non-proprietary Internet-based prototype that can be used by other organizations, is readily replicated by others, and keeps costs manageable for states and organizations with small operating budgets. Its goals are ambitious: to explore ways for archaeologists to rethink how they practice their work, expand access to knowledge and information, increase heritage appreciation, expand heritage stewardship, build community, facilitate scholarship, create shared values, and include many voices of all ages in the understanding of the past. More than three decades of lively conversations about archaeology with many Vermont communities, and many types of communities, suggest that "when we build it, they will come."

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[1]Carol McDavid, "Towards a More Democratic Archaeology? The Internet and Public Archaeological Practice," in *Public Archaeology*, ed. Nick Merriman (London: Routledge, 2004), 159–186.

[2]Levi Jordan Plantation Internet Site, www. webarch-aeology.com/html/Default.htm.

[3]McDavid (p. 305n1) 173.

[4]Giovanna M. Neudorfer, *Vermont's Stone Chambers: An Inquiry Into Their Past* (Montpelier, Vermont: Vermont Historical Society, 1980).

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