

Going Mobile: Changing the Face of Interpretation in the National Park Service

Brett Oppegaard and Gregory P. Shine

Across cultures, even in ancient times, people gathered at locations of historical importance to learn about—and to commune with—the place.¹ From petroglyphs to augmented reality, for pleasure and for profit, interpretive services have been developed in many media forms over the millennia, encouraging various activity modes.² Today, federal history agencies of all sorts are responsible for rendering these built environments, to provide heritage interpretation, or localized educational activities.³ Visitors to these historic sites inherently arrive with a latent desire to learn, craving greater depth of understanding, and seeking interaction, entertainment, dialogue, engagement, and motivation.



Actors portray Hawaiians in the Village during production for the Fort Vancouver Mobile project.

In an attempt to serve those diverse needs, heritage sites worldwide have designed

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¹ While a comprehensive review of the development of mediated interpretive technologies is well beyond the scope of this article, helpful overviews of those topics can be found in John Towner, *An Historical Geography of Recreation and Tourism in the Western World 1540–1940*, Hoboken, NJ: John Wiley & Sons, 1996; John K. Walton, *Histories of Tourism: Representation, Identity, and Conflict*, Vol. 6, Bristol, UK: Channel View Publications, 2005; Dimitrios Buhalis and Rob Law, "Progress in Information Technology and Tourism Management: 20 Years on and 10 Years after the Internet—the State of Etourism Research," *Tourism Management* 29, no. 4 (2008): 609–23.

² Multiple authors also cover diverse aspects of the historical context of technology at heritage sites in the compilation edited by Loic Tallon and Kevin Walker, *Digital Technologies and the Museum Experience: Handheld Guides and Other Media*, Lanham, MD: Altamira Press, 2008.

³ David L. Uzzell, "Interpreting Our Heritage: A Theoretical Interpretation," in D. L. Uzzell and R. Ballantyne, eds. *Contemporary Issues in Heritage and Environmental Interpretation: Problems and Prospects*, London: The Stationary Office, 1998, 11–25.

programs and created diverse media forms, from object labels to brochures, from audio tours to interactive multimedia exhibitions.⁴ While a dynamic personal attendant for each visitor might be the idealized interpretive strategy, limited resources dictate difficult choices on such matters, and site managers must also balance relatively limited budgets, many of which have been shrinking in recent years. Traditional supplemental media, such as paper brochures, have been considered both efficient and effective for sharing broad interpretive messages. Yet the convergence of media forms within mobile technologies, such as smartphones and tablet computers, means that a single hand-held device, provided and maintained by the visitor, can offer each person a tailored tour of all of the institution's mediated assets, including animation, text, audio, still imagery, and video, plus an instantaneous connection to all of the world's related information available on the Internet. When considering the interpretive media options available, then, site managers might consider what mobile technologies could do, compared to what other media forms already are offering, and analyze whether mobile might be a better way to share information and stories through emerging channels.

As an example of this situation, the National Park Service (NPS) caretakes about 400 prominent places in the United States, two-thirds of which are primarily history-oriented. The agency also aspires to become the nation's largest outdoor classroom.⁵ The NPS meanwhile acknowledged in a 2010 report that the job of site interpretation already had been largely given to media objects—such as wayside signs, brochures, audio tours, etc.—with each form providing its unique range of informational opportunities as well as inherent limitations. The agency's sites attracted about 280 million visitors that year, and an estimated 78 percent of those had no interpretive interactions whatsoever with staff members, relying entirely on mediated information to develop deeper understandings about the places they were visiting.⁶

The Organization of American Historians undertook an independent examination of the agency in 2012 and found that, although several model projects were identified, the National Park Service “can do more to harness the power of technologies that offer specific promise to advance historical research, interpretation, and connections between the agency staff and the larger historical profession, as

⁴ Kevin Bacher, et al., *Foundations of Interpretation*, Bloomington, IN: Eppley Institute for Parks and Public Lands, 2011.

⁵ Anne Whisnant, et al., “The State of History in the National Park Service: A Conversation and Reflections,” *GWS Journal of Parks, Protected Areas & Cultural Sites* 29, no. 2 (2012): 248.

⁶ Bacher, et al., *Foundations of Interpretation*, 6.

well as public engagement with the past,” adding that mobile apps are well-suited to location-based historical interpretation built upon growing databases of historical archival material.⁷

With such pressing needs for flexible, powerful, and high-quality mediated interpretation, this case study describes the development around that time of a National Endowment for the Humanities–funded interpretive mobile application, or app, within the National Park Service system. This account reflects upon a period roughly from the first telephone call in June 2009 that started the project to the app’s eventual launch in June 2012. It focuses on key decision points and stages in this process, including how we laid the foundation for the work, how we established a focus, and how we overcame various technical issues. We hope that this account will raise issues and provoke discussions about the planning and completion of such a project as a way to prepare federal history site managers for undertaking similar endeavors.

Background

In 2006, the National Park Service released the Interpretation and Education Renaissance Action Plan, which recommended “a new focus and change” in five areas. One of these areas, “Use New Technologies,” recognized that “technology offers new and tremendous opportunities—not to replace national park experiences, but to make intangible meanings available in ways never before imagined. To remain relevant to today’s visitor, the NPS must be a leader in the use of technology applied to informal learning.”⁸ In part, this report conceded that technological advances had “changed the way Americans communicate, find community, learn and think—yet NPS interpretive media are outdated by an average of 20 years.”⁹ In response, the report proffers recommendation 6.0: “Encourage and Adopt Innovation in Interpretive and Educational Technology,” finding that

information technology has become part of every American’s life in the twenty-first century. It is influencing how people learn and interact with each other at the most fundamental levels. Currently, some parks are experimenting with technological innovations such as webcams, podcasts, and mobile communications. To

⁷ Whisnant, “The State of History,” 250.

⁸ National Park Service, *Interpretation and Education Renaissance Action Plan*, Washington, DC: National Park Service Education Council, 2006, 6.

⁹ *Ibid.*, 5.

remain relevant in the lives of young people and embrace how Americans receive and use knowledge in the Information Age, the National Park Service must use appropriate technologies as they become available, and be a leader in adapting technology to enhance place-based learning in park settings and at a distance.¹⁰

As an extension of that effort, the National Park Service has also been working on a New Strategic Plan for Interpretation, Education and Volunteers, 2013–2016 (in the public comment stage, as of this printing), which includes the additional goal of the agency to “use leading-edge technologies and social media to effectively communicate with and capture the interest of the public.”¹¹

From a broader perspective, the National Park Service did not invent the concept of historic site interpretation, but the agency has consistently generated innovative advances within this communicative field for more than a century. John Muir, living and working in Yosemite Valley in the 1870s, used the term “interpret” to describe his process of writing about, understanding, and sharing information about the complex natural environment around him. About a decade later, U.S. Army soldiers, stationed near the Upper Geyser Basin in Yellowstone, explained the thermal features of the world’s first national park to visitors via “cone talks,” one of a variety of precedents that can be considered part of the lineage of the agency’s modern interpretive services. Those advancements in mediated communication also include the design of paths, plant labels, and an arboretum in Yosemite National Park in 1904. Traces of this lineage can be seen in the design of paths and accompanying wayside signs at many historic sites today. Interpretive efforts include the assembly and display of prehistoric artifacts at Casa Grande Ruin Reservation in 1905, the origin of the organization’s museum exhibits. They also include the series of printed handbooks, focused on larger parks and on such topics as “The Secret of the Big Trees: Yosemite Sequoia” (developed in the 1910s by the Department of the Interior), an ancestor of supplemental media forms, such as brochures. These brochures can be seen as the forerunners of interpretive innovations tied to technological advancements, eventually leading to different kinds of multimedia displays, including audio tours and video exhibits, designed to increase popular and political support but also to encourage *in situ* education about natural as well as historic places of special interest.¹²

¹⁰ Ibid., 11.

¹¹ National Park Service, *New Strategic Plan for Interpretation, Education and Volunteers, 2013–2016*, Washington, DC: U.S. Department of the Interior, 2013, 9.

¹² Barry Mackintosh, *Interpretation in the National Park Service: A Historical Perspective*, Minneapolis, MN: University of Minnesota Press, 1986, 2.

While Freeman Tilden did not invent the activity of interpretation, he did develop and codify an important initial set of operating principles. He provided a guiding definition of such efforts, as “an educational activity which aims to reveal meanings and relationships through the use of original objects, by first-hand experience, and by illustrative media, rather than simply to communicate factual information.”¹³ This definition and Tilden’s “six principles of interpretation” have helped to shape the philosophy of interpretation for the 21st century as well. This is typified by the updated and expanded principles offered by Larry Beck and Ted T. Cable and the streamlined definition of interpretation used today by the National Association for Interpretation, in which the term is defined as “a mission-based communication process that forges emotional and intellectual connections between the interests of the audience and the meanings inherent in the resource.”¹⁴

From such a historical perspective, developing a mobile app for a national park is a logical extension of decades of experimentation with new media forms within interpreter circles and of an evolving sense of the scope and purpose of interpretation. While the thermal features at the Upper Geyser Basin in Yellowstone might not have changed much in the past century, the scientific (and inherently human) understandings of those features have developed dramatically, the number and range of communication channels available for spreading information about those features has increased substantially, and each new media form applied to the interpretation and mediation of those features offers unique affordances and constraints that shape the messaging. As Marshall McLuhan and Quentin Fiore famously stated, “the medium is the message.”¹⁵

Starting with Socrates’s predictions of how writing would change the world of orality for the worse—available for us today, ironically, because Plato wrote about them—each new medium typically attracts utopian and dystopian discourses as a way to find the edges of the medium’s appropriate place in time and worthwhile uses.¹⁶ This article’s focus upon the mobile medium, as a new delivery channel

¹³ Freeman Tilden, *Interpreting Our Heritage: Principles and Practices for Visitor Services in Parks, Museums, and Historic Places*, Durham, NC: University of North Carolina Press, 1957, 8.

¹⁴ Larry Beck and Ted T. Cable, *The Gifts of Interpretation: Fifteen Guiding Principles for Interpreting Nature and Culture*, Urbana, IL: Sagamore Publishing, 2011; “Mission, Vision, and Core Values,” *National Association for Interpretation*, <http://goo.gl/oHG9nt> (accessed July 1, 2013).

¹⁵ Marshall McLuhan and Quentin Fiore, *The Medium Is the Message*, New York, NY: Bantam Books, 1967.

¹⁶ Plato, *Phaedrus*, translated by R. Hackforth, Cambridge, MA: Cambridge University Press, 1972, 67–70.

for historical interpretation, is founded upon Joshua Meyrowitz's conceptualization of Medium Theory, in which the particularities of the medium, rather than the media content, create the infrastructure of the built environment, including what can and cannot be done, and what can and cannot be shared and learned, reshaping people and culture within a socio-historical context.¹⁷ In later writings, Meyrowitz argued that medium studies should focus upon the emerging possibilities afforded by a new medium, and the new forms built upon those possibilities.¹⁸ Under that directive of creatively exploiting a new medium for both old and new purposes, this case study describes the development of an interpretive mobile app designed at a National Historic Site. Its purpose is to challenge traditional understandings about mediated interpretation, not simply to shift media messages from other forms into a new shell but to invent new and interactive techniques of interpretive media.

The need for better understanding of mobile technology's place in society increased dramatically in the 2000s, when wireless device use by Americans rose from about 30 to 90 percent, and data-sharing revenues from mobile use skyrocketed from \$140 million to \$37 billion.¹⁹ In other words, what was a fringe technology suddenly became ubiquitous, and what was a relatively well-comprehended form of communication, the telephone call, quickly morphed into a myriad of mysterious uses for highly mobile Internet-connected and hand-held computers. At heritage sites, as people began looking at their phones rather than wayside signs and wall texts and brochures, some, particularly industry practitioners and artists, responded by making early forms of mobile apps about those special places. A few researchers, meanwhile, began to ponder this phenomenon and started looking at mobile app development in heritage contexts in different ways, including as a new form of narrative, as a way to better develop ties between historical characters and places, to examine visitor behavior, to guide navigation of a historic area, to remotely search and browse cultural heritage repositories, and as a way to geolocate archival material, with a survey of additional mobile tourist guides generated during that influential 2000s decade provided by Michael Kenteris, Damianos

¹⁷ Joshua Meyrowitz, "Medium Theory," in *Communication Theory Today*, Stanford, CA: Stanford University Press, 1994: 50–77.

¹⁸ Joshua Meyrowitz, "Shifting Worlds of Strangers: Medium Theory and Changes in 'Them' Versus 'Us,'" *Sociological Inquiry* 67, no. 1 (1997): 59–71; Joshua Meyrowitz, "Medium Theory: An Alternative to the Dominant Paradigm of Media Effects," Robin L. Nabi and Mary Beth Oliver, eds. in *The SAGE Handbook of Media Processes and Effects*, Thousand Oaks, CA: SAGE Publishing, 2009, 517–30.

¹⁹ CTIA, "Wireless Quick Facts." The Wireless Association, <http://goo.gl/f5cwtA> (accessed July 10, 2013).

Gavalas, and Daphne Economou.²⁰ This group of leading-edge researchers also worked in a variety of ways methodologically, with some focusing on quantitative approaches, such as counting particular activities enabled by mobile technology, or comparing app analytics after interventions, while many focused upon descriptive case studies, as a way to better understand, through action and reflection upon that action, and through a focus upon contextualizing such description.

When our research project began in June 2009, with simply an interest in this topic of national conversation, few heritage sites in the world had mobile apps associated with them, and most of those apps were expository in nature, neither interpretive nor interactive. Because of our limited access to those projects, their relatively narrow capabilities, and our desire to innovate, we decided to build an app and learn how that process worked by taking a constructivist approach through a case-study methodology.

The study of a single case—an in-depth, multifaceted investigation, using qualitative methods, of a single social phenomenon—has been proven valuable in a variety of situations, especially in allowing researchers to get as close to the action as the actors themselves.²¹ Naturalistic generalization through a case study, from recognizing similarities of objects and issues, within and outside of context, and by sensing natural covariations, is both intuitive and empirical, as a way of comparing theoretical understandings to practical examples.²² Because of the special circumstances in this case, with the paucity of heritage site mobile apps with interpretive and interactive elements, such a study of a bounded system allowed rich and important details to emerge that otherwise would have been hidden or obscured by other methodologies, demonstrating both the uniqueness of this project and

²⁰ This array of examples comes from, in order: Jeremy Hight, “Narrative Archeology,” XCP: Streetnotes, <http://goo.gl/BBpYxK> (accessed July 10, 2013); Valentina Nisi, Ian Oakley, and Mads Haahr, “Inner City Locative Media: Design and Experience of a Location-Aware Mobile Narrative for the Dublin Liberties Neighborhood,” *Intelligent Agent*, vol. 6, no. 2., (2006); Levi Novey and Troy E. Hall, “The effect of audio tours on learning and social interaction: An evaluation at Carlsbad Caverns National Park” *Science Education* 91, no. 2 (2007): 260–277; Michael Epstein, “Moving Story,” Cambridge, MA: *Media in Transition* 6, *Stone and Papyrus* (2009), 1–4; Chris Van Aart, Bob Wielinga, and Willem Robert Van Hage, “Mobile Cultural Heritage Guide: Location-Aware Semantic Search,” *Knowledge Engineering and Management by the Masses*, Berlin: Springer, 257–71; Daniel Kerr, “Cleveland Historical a Free Mobile App That Puts Cleveland History at Your Fingertips,” *Oral History Review* 39, no. 2 (2012): 314–17; Michael Kenteris, Damianos Gavalas, and Daphne Economou, “Electronic Mobile Guides: A Survey,” *Personal and Ubiquitous Computing* 15, no. 1 (2011): 97–111.

²¹ Joseph R. Feagin and Anthony M. Orum, *A Case for the Case Study*, Chapel Hill, NC: The University of North Carolina Press, 1991.

²² Robert E. Stake, *The Art of Case Study Research*, Thousand Oaks, CA: Sage Publications, Inc., 1995.

the commonalities it shares with similar efforts, both present and future.²³ The essence of a case study, from such a perspective, is to illuminate decision points, and to explain why they were taken, in what ways, and with what results. In that regard, we followed traditional case study methodology, including Robert K. Yin's guidelines for a descriptive case study.²⁴ Our approach also was guided by this research question: How can we learn more about the potential for interpretive mobile apps at historic sites by going through the process of developing one?

Preparing the Foundation

Both of us had been independently involved in innovative digital projects of different types in our respective industries of mass communication (Oppegaard) and historic site management (Shine) for more than a decade, from experimentation with media delivery systems, to the creation of Web-based programs, to the construction of social media identities and channels. Yet we also had not worked together before, or been a part of any mobile-oriented project prior to beginning this case study. The Fort Vancouver Mobile project started with a simple cold call, from Oppegaard to Shine, with the mobile media scholar asking the park manager, who also is a technology-inclined academic, if the Fort Vancouver National Historic Site would be interested in working on a research project related to mobile media as applied to heritage interpretation.

Academic research focused upon an industry, and operating within that industry, has been long considered by economists as a prime way for the field to create new knowledge and to fuel technological opportunities, especially when that research is conducted in public, transparent ways.²⁵ Community engagement meanwhile has been a primary goal of the American academic system since its founding, and professors with research appointments, such as Oppegaard, have discretion about

²³ Ibid.

²⁴ Robert K. Yin, *Case Study Research: Design and Methods*, Thousand Oaks, CA: Sage Publications, 2009; Wilbur Schramm, "Notes on Case Studies of Instructional Media Projects," Washington, DC: *Academy for Educational Development*, 1971; Winston Tellis, "Application of a Case Study Methodology," *The Qualitative Report* 3, No. 3 (1997): 1–17; Dawson R. Hancock and Bob Algozzine, "Doing Case Study Research: A Practical Guide for Beginning Researchers," New York, NY: *Teachers College Press*, 2006.

²⁵ Edwin Mansfield, "Academic Research and Industrial Innovation," *Research Policy* 20, no. 1 (1991): 1–12; Edwin Mansfield, "Academic Research and Industrial Innovation: An Update of Empirical Findings," *Research Policy* 26, no. 7 (1998): 773–76; Zvi Griliches, "Issues in Assessing the Contribution of Research and Development to Productivity Growth," *R&D and Productivity: The Econometric Evidence*, Chicago, IL: University of Chicago Press, 1998, 17–45; Andrew Toole, "The Impact of Public Basic Research on Industrial Innovation: Evidence from the Pharmaceutical Industry," *Research Policy* 41, no. 1 (2012): 1–12.

how to spend that time, providing valuable resources to any project.²⁶ Oppegaard had worked with the National Park Service site before, as a journalist embedded in a historic Base Ball game, and Shine had taught college courses, so each of the authors had some experience working in the other's realm.

Under Shine's direction, the Fort Vancouver National Historic Site had been an innovator in applying digital media to historic site interpretation in the National Park Service. Shine initially worked for the National Park Service in San Francisco's Fort Point and Presidio, where he helped develop the site's first audio tour. At Fort Vancouver, training opportunities in Web site development led to early experimentation with podcasting and Facebook, Twitter, Flickr, and other social media platforms, which led Shine to help design and teach the agency's first Introduction to Digital Media weeklong webinar through the Stephen T. Mather Training Center in Harpers Ferry, WV. Shine also created the site's Public History Field School, through a partnership with Portland State University, and as an adjunct professor he integrated digital media into his class projects in historic site interpretation, including Web features, a five-year podcast plan for the NPS Civil War Sesquicentennial commemoration, and the NPS's first interpretive iBook publication to connect material culture items to broader regional themes.

Through such efforts, the site's receptiveness to digital projects lay in the identification of their value and the integration of their potential in park planning documents, especially those directing interpretation and education programming. While creating a long-range interpretive plan for the park's recently opened Village area, where most of the Fort Vancouver workers lived in the mid-1800s, Shine identified the area's unique site features (including distance away from parking areas and staffed facilities and adjacency to an active airfield and major regional railway and interstate highway transportation hub) and observed use patterns (prevalence of recreational walkers and runners rather than those seeking out the Village), while also factoring in the realities of budget and staff reductions. In those planning documents, Shine included such verbiage as:

²⁶ Ira Harkavy and John Puchett, "Toward Effective University-Public School Partnerships: An Analysis of a Contemporary Model," *The Teachers College Record* 92, no. 4 (1991): 556–81; Ira Harkavy, "The Role of Universities in Advancing Citizenship and Social Justice in the 21st Century," *Education, Citizenship and Social Justice* 1, no. 1 (2006): 5–37; Ira Harkavy and Bill M. Donovan, *Connecting Past and Present: Concepts and Models for Service-Learning in History*, Vol. 16, Sterling, VA: Stylus Publishing; Tracy Soska and Alice K. Johnson Butterfield, *University-Community Partnerships: Universities in Civic Engagement*, New York, NY: Routledge, 2013.

Interpretive media and technology offer those interested in national parks added opportunities for learning experiences that fit their unique needs and interests, especially visitors with certain disabilities. In accordance with service-wide mandates, an expanding range of interpretive media shall be available to enhance the visitor experience in the Village. ... New technologies offer fast-changing possibilities for connecting visitors with experiences, resources, and meanings. Surveys indicate high degrees of enjoyment and value associated with traditional outdoor media such as wayside exhibits, brochures, and bulletin cases.²⁷

In addition, rapidly changing technology is transforming the quantity, quality, and type of NPS information available to the public. New services include online publications, web sites, digital images, video files, and audiovisual services. Radio, GPS-enabled, and ambient technologies are increasingly allowing people to receive interpretation and orientation information through personal handheld devices in response to specific locations, resources, and visitor interests.²⁸ As part of that development process, the Village was designated as the site's testing ground for new media and technology projects, which helped to focus resources toward the mobile app project, by giving it a place.²⁹

Shine also integrated digital media into the final document in several critical areas. In addition to a specific recommendation for the site's nonpersonal services, the fourth of four comprehensive site themes, "Community and Connection," included digital media, stating that, "the concept of the Village as a community gathering place is not static; the Village story can be expanded and interpreted through the use of digital media, free and openly accessible by the public."³⁰ In addition, a specific "Visitor Experience Goal" was created, stating that future visitors to the Village should be able to "access information and interpretation for the Village through a variety of means, including personal programs, waysides and publications, and digital media."³¹ Recommendations for personal services also addressed digital media, noting that, "in acknowledge-

²⁷ National Park Service, "Interpretation in the Fort Vancouver Village." Washington, DC: *U.S. Department of the Interior*, 2010, 34.

²⁸ National Park Service, "Interpretation and Education Renaissance Action Plan," Washington, DC: *National Park Service Education Council*, 2006, 11.

²⁹ National Park Service, "Interpretation in the Fort Vancouver Village," Washington, DC: *U.S. Department of the Interior*, 2010.

³⁰ *Ibid.*, 11.

³¹ *Ibid.*, 12.

ment of the area's logistical challenges, special consideration shall be given to web-based, e-learning, digital-based, augmented reality, and distance learning opportunities that can utilize Village resources to help students connect to the park and understand its significance."³² Those kinds of documented goals, and explicitly stated priorities, were essential to keep momentum on this project going over the time it took to build the app, particularly when resources at the site, and throughout the agency nationwide, were cut significantly during this development process, and numerous arguments had to be made, regionally and nationally, to keep supporting the work.

Several factors weighed heavily in the decision to designate the Village as a site for experimentation with digital media. The location of the Village presented significant challenges to interpretation. The Village, for example, is located on a pedestrian-and-bicycle trail more than a quarter-mile from the nearest parking area, away from any staffed facilities and without restroom access. Two reconstructed cabins mark the eastern boundary of the Village, but staffing limitations precluded opening them to the public except for scheduled education programs and occasional cultural demonstrations. Once visitors were able to access the Village site, however, the location presented additional challenges. Just yards away from a major rail transportation line and the intersection of a state highway and Interstate 5, the west coast's major north-south thoroughfare, the site also sits in the direct pathway of a municipal airfield (Pearson Field) and a major international airport (Portland International). As a result, the background noise level makes traditional ranger-led tours and talks challenging to hear unless presented inside the Village's reconstructed cabins.

Knowledge of, and access to, the Village area also had been historically limited. Not until the creation of the Fort Vancouver Landbridge in 2008 was the Village area regularly accessible to the public. Prior to that time, it was largely overgrown with Himalayan blackberries and homeless encampments, without regular public access or



Based on the user's GPS location, the Fort Vancouver Mobile app offers either interactive content or, as shown, directions to reach the site.

³² Ibid., 31.

programs. In 2000 Tracy Fortmann became the park's new superintendent, and she initiated archaeological research and programming to raise awareness of the Village area and helped to envision and create a trail through the Village to connect the historic site back to the Columbia River and its waterfront trails. Upon the opening of the Landbridge and its connecting trail system, most visitation was recreational in nature, primarily joggers, bikers, walkers, and others intent on fitness, meaning people were not necessarily coming to the place to make the historical connection. Thus, attracting the attention of these recreational visitors and piquing their interest in the area's history became a major interpretive challenge, one that the coauthors and others in the agency believed digital media, in the form of a mobile app, could help to address.

Defining the Scope

While the coauthors and their respective organizations were open and eager to try such a partnership, in the abstract, decisions about the details had to be made soon, in terms of defining the scope of the Fort Vancouver Mobile project, such as where it should start, how ambitious its goals should be, and how success would be measured. Because mobile apps were relatively new at the time and the technology was quickly evolving, and because few models of interactive interpretive apps existed in the realm of heritage work, we were not even sure in the beginning of what we could do, how we could do it, or what the results would be. Our assumption was that we could create some significant intervention, even if in the end it was a modest one, that would enrich the media ecology of the historic site. Initial discussions revolved around simply geolocating historic imagery and then digitally embedding that imagery at its original location, similar to the approach since undertaken by Cleveland Historical and its offshoots.³³ But because the history of Fort Vancouver primarily peaked in the mid-1800s on the frontier, few images were available, and even at that time, geolocating imagery did not seem to us to be an ambitious-enough exploration of the potential of the technology.

We instead started thinking about experimentation with interactive narrative forms, primarily because mobile technology seemed inherently interactive, with powerful sensory inputs and outputs, because both of us were interested in historical interpretation as storytelling. Also the location we had chosen to work—the Village—needed interpretive media and had been envisioned as the place for such experimentation, and because not much academic inquiry had been conducted in that area.

³³ Daniel Kerr, "Cleveland Historical a Free Mobile App," 2012, 314–17.

In that regard, we decided to gather the best of the Village's potential storylines and discuss which of those we would pursue in this initial mobile app. Before that, though, we also had to determine which people and skill sets we needed on the team, including key agency stakeholders, as well as assess what resources were required and available. This process became somewhat of a chicken-or-the-egg scenario, in which we did not know exactly what we needed until we had a story idea, and we did not know which story idea could be produced the best without knowing exactly who was on the team. Eventually, we decided to include stakeholders from throughout the agency's site, including archaeologists, curators, historians, and administrators. We also included supportive professional media producers in the area, including photographers, multimedia designers, and videographers, and a supportive Web-development company, which could handle the technical issues. We included academics from three institutions—Washington State University Vancouver, Portland State University (PSU), and Texas Tech University; scholars from programs focused upon media technologies; and PSU's history program. Practically speaking, every person in this initial group was either willing to contribute significant sweat equity to the project, or they did not stick around for long.

In our initial meeting, besides basic orientation information, we shared five paragraph-length prompts with this group that we thought could make the core of great interpretive pieces delivered through mobile technologies. At that point, we did not discuss production specifics, just narrative focus. We considered some broad topics for stories, such as integrating information about ethnic diversity at the site (more than 35 different ethnic groups lived and worked together harmoniously), archaeological knowledge (through the regular excavations), and period diseases (such as malaria and smallpox). We also discussed the issue of Native American slavery in the Village and a documented anecdote of a female African American slave at the site being emancipated, as potential storylines to explore.

All of these ideas generated significant discussion, but the group gravitated toward the topic of the native Hawaiians in the Village, the largest of the ethnic groups, and their stories of being brought to the site in the mid-1800s, under labor contracts, and encountering a polarizing figure in William Kaulehelehe, who was brought from the islands to



A screenshot of costumed interpreters reenacting the Columbia River landing of William Kaulehelehe.

help integrate British culture within the Hawaiian community by proselytizing Christianity. Not only did Fort Vancouver have some detailed documentation of Kaulehelehe's time at the site and his struggles there, it also had a photograph of Kaulehelehe and his wife, Mary Kaai, the only Hawaiian woman known to have lived at Fort Vancouver. The research team unanimously decided to pursue the Hawaiian story, through Kaulehelehe, but no one in our group was connected to the Hawaiian culture.

The next step was to approach the regional Hawaiian cultural organization, the Ke Kukui Foundation, and talk to their board members about the project and the idea. In short, they were receptive and supportive, and we outlined ways in which we could work together. Before long, the Ke Kukui Foundation had become a fully invested and active partner in the development of this app, providing critical support, ideas, and resources. Ke Kukui members went far beyond their original commitment of basic participation in this research. Those contributions included providing performers for reenactments, ranging from the recording of period chants to full-scale video reconstructions, but also historical research assistance, cultural consulting and vetting, and marketing to a targeted audience of likely interested mobile app users. Besides simply being a conscientious and considerate partner, we think the entire relationship began well because we came to the foundation first with the idea, with an openness and willingness to work together, without an agenda or a specific prescription for how that partnership should work, or how the Hawaiian story should be told. In short, similar to the development of the National Park Service partnership, we came with an idea and let it grow as organically as possible. Meanwhile, during this multiyear development process, the Fort Vancouver National Historic Site and the Ke Kukui Foundation (as an extension of the local Hawaiian community) reestablished and strengthened ties and began building a fuller relationship that transcended the mobile app project.

Establishing the Historian's Ethic

Besides cultural considerations, this mobile app brought together individuals with different sensibilities about source materials and storytelling styles. Some of the team's members were experimental artists, who argued that fiction can be more truthful than nonfiction, and some of the team's members were conservative historians or archaeologists insistent that the facts speak for themselves. From the start, though, we decided that this piece would maintain the ethical standards of the historian, in which our work would never contradict the historical record; that we would try our best to stay well within established parameters known about the period's historical events and sociocultural practices. This stance proved critical on many occasions

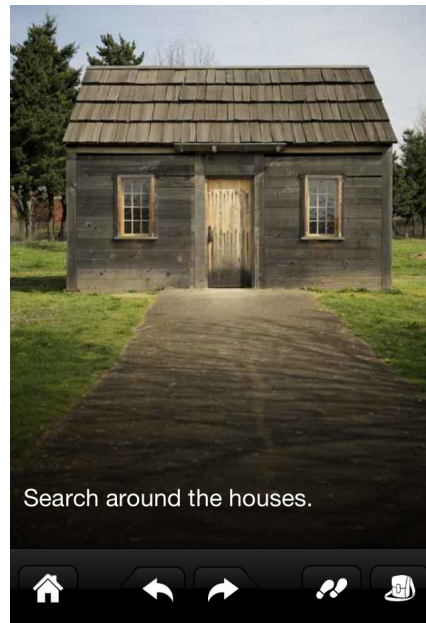
when interpretive ideas were pitched, or storylines were discussed, because our initial response was to look at the historical record and what it supported before deciding how to mediate an idea or develop a thought beyond that first step of screening.

Despite those best intentions, though, several situations arose in which the answers to our historical questions we had were unknown, secondary source material turned out to be faulty, or small details escaped our attention. For example, we were developing various video reenactment pieces and wanted to somehow represent the sacred nature of the hula dance and its importance to the Hawaiians, even under British authority. The hula was suppressed in the mid-1800s as a way to denigrate the native culture of the Hawaiians. While checking the historical record, we discovered a compelling anecdote about the hula in the Village, noted in a master's thesis at a major west coast university. In this anecdote, the student described various acts of suppression, and ridicule, of the Hawaiians, including a specific incident in which the taunting of hula dancers was so vicious that a couple of Hawaiians deserted Fort Vancouver the next day.

So we decided to film a representation of the hula (using all males, as was customary) and to show this sort of puritanical reaction and its consequences. The Ke Kukui Foundation provided dancers and actors, and we spent about six hours filming this simple scene (with a cast of about a dozen, and a crew of another six, thereby expending significant resources). Even before filming, however, we knew that we wanted to know more about this story, to provide additional context within the mobile app beyond just showing the video. A Portland State University graduate history student researched the primary documents for us and eventually found that most of what we had taken from that master's thesis, and what had shaped our ideas about the video production, was incorrect due to student errors in the interpretation of primary documents. There were no major debates about what to do. We scrapped the video work. There was no finger pointing or ill will. We simply had a commitment to historical integrity, and, because the original idea did not meet that standard, we could not use it in the original form (although we did find a use for some of the footage more than a year later).

Overcoming Technical Issues

An entire monograph could be dedicated to the numerous technical issues we had to overcome during this app-development process. This is not intended to frighten those wanting to try such a project, but it is meant as a fair warning that technical issues in a constantly changing development market are not to be taken lightly. No matter how many resources we invested into the back-end

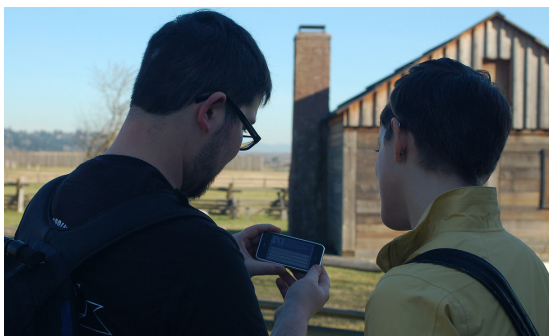


Left: Different interactive story modules can be chosen, based on user interest. *Right:* Users receive guidance for exploring the site, including a photographic reference and instruction text.

development of this project, those never kept pace with the technical changes we continually encountered. Therefore we shifted our perspective on this project from the idea of creating a polished finished product and evolved toward the more rational and reasonable goal of launching a viable mobile app, and then making each iteration of that app better than the previous version, as long as resources and interest in the project existed.

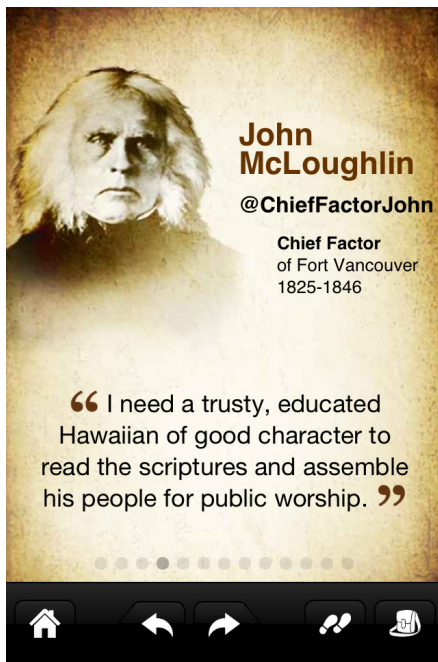
When we started this project in mid-2009, for example, each device platform required that the app be programmed in the programming language of the device. Even though the app offered essentially the same experience on different devices, it actually had to be rewritten for each platform from scratch, in divergent languages. Thus the first version of the Fort Vancouver Mobile app was programmed in both Java (Android) and Objective-C (Apple), and all changes, even small ones, had to be coded and tested, and uploaded separately. About a year into the development process, though, new HTML5 and open-source options emerged in which we were able to once again rewrite the app, this time in JavaScript, a common computing language, and to incorporate other universal computing systems that included CSS 3, PhoneGap, jQueryMobile, and additional mobile libraries that enabled us to significantly streamline the production process and increase the iterative improvements.

We launched the Fort Vancouver Mobile app to the public in June 2012, and we are able to report (as of September 2013) that the free app (in both Android and Apple forms) has been downloaded more than 1,500 times (with about a 2:1 ratio of Android:Apple). The behind-the-scenes blog that we keep on this project, www.fortvancouvermobile.net, has recorded more than 35,000 page views, and faculty contributors have given formal presentations about this project at a variety of international conferences and workshops, including for the International Communication Association, the Digital Humanities Summer Institute, and the International Design and Media Arts Association. The overall project has earned about \$140,000 in grant monies to date, including funds from the National Endowment for the Humanities, all of which have helped to cover the costs of equipment, personnel, and distribution channels. The first module, based on the Hawaiian story and titled “Kanaka,” earned the coauthors the 2013 John Wesley Powell Prize for outstanding achievement in the field of historical displays from the Society for History in the Federal Government, and the overall effort of Oppegaard, as coordinator of this project, earned him the national 2012 George and Helen Hartzog Award from the National Park Service, the top individual award in the agency for external collaborators. In addition, the Fort Vancouver Mobile project is now considered a national model for the agency and was included in the National Park Service’s first Introduction to Digital Media webinar, presented service-wide to agency innovators across the country in 2011 as a way to reach toward its increasingly ambitious goals of technological innovation.



Various classes in history, communication, digital technology, and culture at Washington State University and Portland State University have been integrated into the Fort Vancouver Mobile project. Students have designed different types of mobile modules, ranging from animation to geolocated journalism.

Much was unknown about mobile design when we began the development process, from seemingly small technical decisions, such as the best screen orientation for looking at historic photographs, to larger and more abstract issues, such as ideal cognitive load, when considering the user within a dynamic physical and digital juxtaposition. The constraints of mobile technology are many, including limited typefaces, small information spaces, awkward input systems, screen glare, weak audio outputs, and other factors. While each new generation of mobile devices improves these situations, empirical investigations into many of the design questions we had still have



The FortVancouver Mobile app experiments with new techniques for sharing historical documents, including converting period letters into Twitter exchanges.

not been undertaken, and many of the interactive properties and compelling research questions we had about media mobilities remain unexplored. From a research perspective, that means much fertile ground remains. From a development perspective, that means even best practices in this field are speculative and generally limited in applicable value. That said, there follow some other critical findings from this exploratory research.

Major Lessons Learned

Building Partnerships

While working on a mobile app project is not necessarily a cost-effective way to build audiences at this point, it is a dynamic form of community engagement that likely could lead federal histori-

ans to new partnerships, a more creative ecosystem of ideas, and innovative solutions to interpretive problems within their communities. At Fort Vancouver, besides the external engagement, National Park Service staff members in different disciplines – archaeologists, curators, interpreters, and others – bonded through work on this app project, breaking down compartmentalization of duties. In a variety of ways, the engagement of stakeholders in an exploratory and experimental project, particularly with the mobilities aspects of this technology, invariably lead to important questions being raised and ambitious interventions being attempted. Because mobile apps primarily succeed due to the poetics of place, or context, they are ideally situated as a tool to expand historical interpretation. As this field of inquiry matures, more practical options will emerge. Culturally, though, federal history organizations need to be trained toward supporting this type of interpretive service, through the development of foundational plans, the alignment of overall ideals, and the active practice of trying new ideas, even if some or even most fail. Building a mobile app through a community partnership is a significantly different experience for an organization from hiring a third-party developer, which could be quicker, but, in the long term, more costly. That said, a mobile app project is labor intensive, and can be frustrating, so it potentially could be a project that gets a quick dismissal, without end goals, regular meeting times, and other specific commitments in place.

Beyond the App

Just because a piece of media was created for a mobile app project does not mean it has—or will have—no other uses. While all of the media objects integrated into the Fort Vancouver Mobile project were specifically designed for the mobile app world, many of the videos, and images, ended up having secondary uses for us. Those uses included a public gallery exhibition called “The Art of Fort Vancouver Mobile,” a permanent visitors-center display that loops samples of the videos, a ringtone taken from one of the video sound files, several commissioned pieces of period music available for use throughout the site, and as a repurposed part of the content in an iBook about the objects found at Fort Vancouver. While this content can migrate around the various media channels offered by a historic site, it also can begin to help connect a historic site to its larger context—regionally, nationally, and internationally. The app, as part of the larger networked world, suddenly can bring together ideas and sources from other places, and give people in other places access to otherwise local amenities. Unlike a brochure, or wayside sign, mobile apps, in digital forms, are relatively easy to update, and can be expanded and perpetuated indefinitely. Similar to other media forms, like brochures, though, a mobile app is not intended to replace all human interaction at a historic site. It is intended to supplement the site’s mediated interpretation in new ways. That should be made clear to staff members and volunteers, who might have fears they are going to be replaced by technology, and app services should be designed to complement the successful experiences already offered, rather than replace them.

Accessibility and Awareness

Even though the Fort Vancouver Mobile app is embedded near major highways, near a large metropolitan city (Portland, OR), at the intersection of flight paths and train tracks, and next to one of the nation’s mightiest rivers, the Columbia, it still has no stable wireless connection. That means app users have to tap into personal data plans and 3G/4G connections to download the app and the streaming material it provides. Connection speed is one of the most important aspects of a mobile delivery system, and a slow connection can spoil any app work that relies on storing media outside of the personal device. As an example, at one point in development, Apple—unknown to us—limited its 3G downloads to apps of 10 MB, or less, about the same time we were bringing a tour group to the site to have its members try the app on their own devices. So we had several frustrated people, unable to access Wi-Fi at the site, and unable to download the app they had come to the site to try. In addition, because of the glut of mobile apps available, and because of the scarcity of mobile apps at historic sites, developers could easily create unrealistic expectations for an app at a heritage site. That could include envisioning massive amounts of downloads, and a high percent-

age of site visitors automatically thinking to download the app, without a targeted marketing plan. Even if the app is free, visitors still will need to know it exists, and how to find it in their respective markets. In our case, we instruct them to search for “Fort Vancouver.” Yet we also have experimented with a variety of marketing strategies, with mixed results. Marketing and distribution, though, have not been of primary emphasis at this point.

* * *

With a long-term and broad perspective on the development of innovative interpretive services at this historic site, the Fort Vancouver Mobile project has provided a rich opportunity for a sustainable and expansive partnership to grow among the National Park Service, academics, and industry professionals all curious about the potential application of mobile technologies to heritage learning. Through that process, students, faculty, media practitioners, and federal history employees have been able to forge together long-lasting and institutionalized programs, creating significant public benefit. Start-up opportunity costs for such partnerships are often high, as time and effort are needed to collaborate across organizations and institutional cultures, while also determining common ways to establish mutual success. By viewing such partnerships as long-term investments, though, with costs spread over time, the fruits of these collaborations come in spurts, and in surprising places. Coauthor Shine, for example, started this project seeing the mobile app as the ultimate outcome, but as his participation in this app development process grew, he taught and took workshops at Washington State University Vancouver, including a session on iBooks, which inspired him to create the ground-breaking Fort Vancouver iBook, which included a repurposing of a video reconstruction from the mobile app. That sort of circular synergy is indicative of what has happened to us throughout this development process, in which every step revealed new opportunities, forward and sideways, and every new piece placed in the puzzle exposed other areas for exploration and discovery. All of this started with a cold call, suggesting that such a partnership between a federal agency and a university might be worthwhile. From reading about these experiences, federal historians might want to consider how they would answer such a proposal; or they might even consider initiating such a call themselves.

Photo credits: Hawaiian actors, students and app, Courtesy of Fort Vancouver National Historic Site, National Park Service; Fort Vancouver apps screens, residents in boat, Courtesy of Fort Vancouver Mobile.