Proceedings of the 38th Annual Conference on Computer Applications and Quantitative Methods in Archaeology, CAA2010
F. Contreras, M. Farjas and F.J. Melero (eds.)

Location-based Interpretation at Archaeological and Heritage Sites: Visitor Reception to New Media Tours

Massung, E., Cater, K.
University of Bristol, UK
elaine.massung@gmail.com; cater@cs.bris.ac.uk

This study investigated how the delivery of interpretation affects the experience of visitors at heritage sites, with a specific focus on location-based media. Presented are the steps leading to the development of three digital prototypes along with audience observations and evaluations, and the resulting framework that raises important questions that creators must take into consideration when these designing these types of experiences.

Keywords: Interpretation, location-based media, mobile devices.

1. Introduction

Technological advances have meant that creating location aware interactive applications such as (ABOWD *et al*., 1997; CHEVERST *et al*., 2000; CATER *et al*., 2005), are no longer just an experimental exercise but an every day reality. The proliferation of smartphones with location-sensing capabilities, along with software, such as Apple's app store, has changed the way media can be delivered. Location-based applications in particular are rising to the forefront of daily life, with applications such as FourSquare, Google Buzz, and Yelp making the user's exact location and movement a key component of the software's functionality. It seems a natural progression that providing heritage interpretation based on location will likewise become standard.

The World Heritage Site of Blaenavon, Wales, designed an in-house location-based e-trail to guide visitors around the town (PERT, 1998), and the company Node Explore has produced a standalone hardware unit triggered by GPS that has been employed at sites such as the historic gardens of Stourhead and the battlefield of Culloden. However, just because a technology can be used does not necessarily mean that it should, and with such rapid advancement little has been done to investigate if users want to use such technology in the first place, and if it is utilized, the qualities that are required to provide visitors with a positive experience.

2. Preliminary Research

In order to determine what visitors expect from interpretation at archaeological and heritage sites, studies were initially carried out at the Roman Baths, a UK site with over one million visitors in 2009 (Association of Leading Visitor Attractions). The audio guides at the Baths are well established (WALTER, 1996), and three English tours are available: (1) a general tour; (2) a children's tour; and (3) a commentary narrated by author Bill Bryson.

All visitors to the Baths are given an audio wand upon entry to the site, and, as with most traditional audio guides, each audio segment is indicated by a sign and number: visitors enter the number of the tour on the device to play the segment. Visitors were given a survey that was completed by 384 people upon ending their audio tour. Although the results were overwhelmingly in favour of the audio guides, a number of points were raised; quotes are as written by visitors.

Visitor #7: *Thoroughly enjoyed tour with audio guide able to move through museum at own pace + interest at various displays with information given.*

Visitor #231: The audio guide provided a great insight into the history that I probably would not have got from reading signs, etc.

2.1. Length of Audio

One of the main topics commented on was the length of audio segments, with visitors stating that they were

too long, or that they preferred to listen to the children's tour as it was much shorter. Audio segments on the general tour typically range in length from one to two minutes, whilst the children's tour tends to limit itself to 30-45 seconds. This desire for brevity is also reflected in the quantitative data, which revealed that of the 80 minutes of audio provided on the general tour, visitors actually only listened to 20 minutes on average.

Visitor #23: *The audio guide sections are too long and bog down the pace of visiting everything here…Keep the sections brief.*

Visitor #51: *Good guide but too long at times.*

2.2. Additional Information

Despite complaints about length, visitors also noted that they enjoyed having the option to get additional information after the main audio section, what the Baths term "Fascinating Facts". What emerged from this is that visitors prefer to have choices, whether to dig deeper into information about an area that interests them, or to skim through the provided interpretation with the liberal use of the fast-forward button.

Visitor #10: *After a talk, more options of "to find out more . . ." press X.*

Visitor #129: *More offerings of "additional info".*

Visitor #291: *Add more stories or points where you can find out a interesting fact.*

2.3. Content

Visitors also expressed contradictory opinions in terms of content. Bill Bryson in particular was either loved or loathed by those who tried the "Bryson at the Baths" tour. This tour also introduced confusion in some visitors who did not know who he was or questioned as to why he had an American accent.

Visitor #22: *Bryson was annoying!*

Visitor #244: *Enjoy his books – speaks with more enthusiasm + accessible descriptions.*

Visitor #309: *Who is Bill Bryson?*

Regarding general content, there was likewise a mix of those who preferred interpretation to be based around facts, and those who preferred to be told a story. However, regarding the latter, many expressed the desire for such stories to be historically based, not imagined as was done with some of the content at this time.

Visitor #85: *More factual explanation and context.*

Visitor #141: *More information about people who worked here, more about ordinary life.*

Visitor #143: *A bit more human interest stories – relate it to the people who lived @ the time.*

Visitor #319: *I always like more background history & facts.*

2.4. Miscellaneous

Additional flourishes to the audio guide, such as music or sound effects, were almost universally panned as distracting or unnecessary, but overall, the questionnaires at the Baths underscored the conflicted nature of the general public and the difficulties faced when creating interpretation.

Visitor #23: *While the information provided was useful and interesting, the audio effects (i.e. splashing, laughing) are superfluous + a bit annoying.*

Visitor #141: *Take off some of the music + sound effects which drown the commentary.*

3. Clifton Suspension Bridge Background

From the results of the surveys at the Roman Baths we were able to identify areas of further interest for trials, such as those listed above. It highlighted that creating a prototype guide that would provide control over the method of delivery would allow better understanding of how these systems affect the user's experience. The Clifton Suspension Bridge, an iconic Bristol landmark, was selected as the location for these trials as on-site interpretation is limited.

4. Clifton Suspension Bridge Methodology

A total of five surveys were carried out at the Suspension Bridge: (1) when no interpretation was present; (2) information provided by leaflet produced by the Visitor Centre; (3) an audio-only guide; (4) a guide with audio and images (both still and video); and (5) an guide with images triggered by GPS.

Based on the results from the initial surveys (1-2), approximately 15 minutes of audio content was developed, with each segment averaging less than a minute in length; this remained the same for all three digital prototypes (3-5). For tours 3-4, a map was designed to provide a suggested route for visitors to follow (mimicking the experience of a traditional audio guide format), whilst the GPS activated site-specific content based on the user's movement across the bridge.

The tours were created using Hewlett Packard's mScape Maker, and the hardware consisted of an HTC smartphone with integrated GPS, and HP iPAQs with external GPS receivers connected via Bluetooth. The author distributed and collected the equipment to visitors to trial, and was on hand to observe their behaviour and offer assistance if needed. As at the Baths, visitors were surveyed upon the completion of their tour as to their experience. Over 150 people completed these surveys.

5. The Seven Cs

The trials have highlighted a number of aspects of location-based technology that must be considered if it is to succeed as a valid form of interpretation. From this, a

framework called the Seven Cs has been developed in order to highlight issues that tour creators need to consider when designing these types of experiences.

5.1. Context

First, is the context of the site itself. Is this type of interpretation suited to the site, or would it be better served by another (perhaps low-tech) method? Is it practical to rely on GPS? How will visitors move through the space?

Although there were sound reasons for selecting the Suspension Bridge as a location to test the prototypes, in practice it became clear that this was not an ideal site for using any type of audio-based technology. It is a working bridge and as a result traffic noise could easily overwhelm the audio, even when using over ear headphones to block some of the ambient noise.

Image #12: *The sound was too quiet at some points with the traffic.*

Image #14: *I needed it to be louder as in particular when cars went passed [sic] I couldn't hear.*

GPS #13: *Louder volume would be appreciated.*

Another issue with urban sites is the safety of the visitor. Users tend to focus on the device at the expense of traffic safety by watching either the images or, if a map is used, the dot representing themselves moving across the landscape (see 4.2). Thus care must be taken when locating the audio and images near high traffic areas, or requiring users to cross busy roads.

A site also has to be interrogated as to the suitability of using a location-based trigger method such as GPS. Whilst most tests ran smoothly, there were occasions where the signal bounced. This is concerning at a site where the regions are close together, as was done at the bridge, and would have to be taken into account in the design process to ensure the user's experience remained stable.

Finally, in regards to the bridge specifically, the space is too constricted to make for a comfortable tour. During busy times of the day, testers often found themselves dodging joggers, people with pushchairs, dog walkers, and Bristol commuters. Thus open field sites would better benefit from the use of GPS technology.

Image #12: *[I was] rushed by people crossing bridge.*

Image #14: *[Visit was] enhanced as I learned so much extra about the bridge and area but distraction as I was watching the videos and keeping out of the way of pedestrians.*

5.2. Clarity

Clarity revolves around the hardware and software used. Is the device easy to use and can the visitor easily navigate through any options provided? This is strong case for relying on the visitor's personal device, which they already know how to use, rather than using separate kit as was done for these trials. It is also a practical step for smaller sites that do not have the money to spend on hardware or the manpower to hand out and collect guides, and could benefit the myriad of archaeological sites that lack any form of interpretation at all.

Using images can greatly enhance an archaeological site by showing what no longer exists, yet something that must be considered at outdoor sites is that the experience can be affected by screen glare. Visitors to the bridge often cupped the device to shade it or stood in the shade of the abutments in an effort to block the glare. However, it is hoped that improvements in display screens, such as ePaper, will soon make it more feasible to use digital illustrations.

Image #7: *Visability [sic] at some points was affected by sun.*

On a related note, the introduction of images served to complicate matters. Although visitors could more easily find features that were referred to within the audio interpretation, as well as view areas of interest that were underground or no longer visible, a number of users commented that they felt they spent too much time looking at the screen rather than the actual site. A balance between providing users with useful information on the device display whilst also allowing them to enjoy the site itself must be found for such guides to be practical.

Image #13: *I found I was looking at the screen a lot rather than the bridge itself. The photos and videos of the history and stuff I couldn't see was excellent. Probably didn't need photos and video of stuff I was standing next too [sic] . . . With the amount of photos and video I didn't really need to be on the bridge at all.*

5.3. Choice

Both at the Baths and the Suspension Bridge, visitors have shown a preference for having different types of tours available and being able to get additional information if desired. This is where digital guides, and location-based media in particular, could enhance a user's experience by tapping into online resources to provide further options.

Audio #2: *Expand the 'extra sections'.*

Audio #9: *I liked the "press play" for extra stories – more of those!*

GPS #13: *Tours aimed at different demographics/different interests would be beneficial (e.g. I'm interested in engineering history).*

5.4. Control

In a similar fashion, visitors have expressed interest in having control over their experience. This extends to control over what they listen to, as well as the physical controls available. Although basic audio controls were programmed into the Suspension Bridge tours to allow the user to pause or stop at any time, due to coding limitations in mScape Maker, rewind and fast-forward

could not be used. However, these features must be included if any digital tour is to be successful.

5.5. Cost

How one measures success is, of course, subjective. During the testing process it was primarily a matter of "did the device work as intended?"; others would be more concerned with whether users learned something from their visit (e.g. PRENTICE, 1991); and companies producing standalone tours or heritage sites interested in producing their own guides would want to know if any money could be made from it.

All testing at the bridge was done free of charge to visitors, but they were queried as to whether or not they would pay to download such a tour at a later time. The results have indicated that they would, and they would be willing to pay more for a GPS tour. However, most also commented that their willingness to pay is inversely proportionate to the entry fee charged.

Audio #10: *I would pay a nominal sum to cover cost only.*

Image #12: *I would pay, especially if it was as good as today.*

5.6. Contact

If being used as a primary form of interpretation, it must be considered how contact is made with the user to receive the tour, whether it's done from a set distribution point or through a download to their own device. If the latter, will the download only be available in advance, or can the user obtain it whilst visiting the site? Will the user be able to replay their personal tour after leaving the site? Perhaps even more importantly, how will the visitor get help if there are problems?

Image #9: *However, had the odd glitch but Elaine was there to help.*

5.7. Content

Finally, it's a cliché, but true that content is king. Despite the different methods used in delivering the interpretation, much of the feedback revolved around the actual information imparted. Although not recorded on the questionnaires, many visitors reported afterwards that they greatly enjoyed the stories of people's involvement in the bridge. A mix of these stories plus typical facts was well received, but as can be seen by the comments below, even more options were desired.

All of this relates back to choice, and giving visitors enough information and enough variety to choose from. That being said, shorter audio segments and the layering of information received high marks, and there were far fewer complaints about the length of audio segments.

Audio #7: *More stories, e.g. things that have happened here.*

Image #2: *Have option for more in-depth information in each section.*

Image #7: *Maybe option to have more info on other areas not directly related to Bridge, i.e. Bristol shipping etc.*

Conclusions

When this research began in 2006, it was imagined that location-based tours would be the latest step in the evolution of interpretation, and would be built upon a similar template as an audio tour, but with the delivery of content being activated by the user's location. Today, it is difficult to gauge what form such guides will take, whether they will follow this pattern, or instead, perhaps rely upon a combination of GPS and a wireless internet connection to display information about the location to users as they pass by.

However, this research has underscored the importance of audience testing when designing new technologies, and that there is no "one-size-fits-all" method of delivering interpretation that will please all visitors. Likewise, the variables discussed above must be considered if digital guides, location-based or otherwise, are to become useful and usable as methods of heritage interpretation.

References

ABOWD G., ATKESON C., HONG J., LONG S., KOOPER R., PINKERTON M., 1997. Cyberguide: A Mobile Context-Aware Tour Guide. In *ACM Wireless Networks* 3 (5), pp. 421-433.

CATER K., FLEURIOT C., HULL R., REID J., 2005 Location Aware Interactive Applications. ACM SIGGRAPH 2005, Conference Abstracts and Applications. J. Buhler, Ed. SIGGRAPH '05.

CHEVERST K., DAVIES N., MITCHELL K., FRIDAY A., EFSTRATIOU A., 2000. Developing a Context-aware Electronic Tourist Guide: Some Issues and Experiences. In *Proc. of SIGCHI conference on Human Factors in Computing Systems*, pp. 17-24.

PERT, T., 2008. *History in your Hands: Using Mobile Devices in Heritage Interpretation*. Royal Commission on the Ancient and Historical Monuments of Wales.

PRENTICE, R., 1991. Measuring the educational effectiveness of on-site interpretation, *Area* 23(4), pp. 297-308.

WALTER, T., 1996. From museum to morgue? Electronic guides in Roman Bath. *Tourism Management* 17 (4), pp. 241-245.