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Cultural Heritage ‘In-The-Wild’: Considering Digital Access to Cultural Heritage in Everyday Life

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Abstract. As digital cultural heritage applications begin to be deployed outwith ‘traditional’ heritage sites (such as museums, open-air museums or galleries), there is an increased need to consider their use amongst individuals who are open to learning about the heritage of a site, but where that is a clearly secondary purpose of their visit. Parks, recreational areas and the everyday built environment represent places that although often rich in heritage, are often not visited primarily to access that heritage. We present the results of a study of a mobile application, called Explore, that supports accessing heritage on a Finnish recreational island. Evaluation with 45 participants, who were not visiting primarily to access the heritage, provided insight into how digital heritage applications can be developed for this user group. Our results showed how low immersion and lightweight interaction support individuals to integrate cultural heritage around their primary visit purpose. Although participants were willing to include heritage as part of their visit, they were not willing to be directed by Explore. Our work outlines future directions that should be considered when expanding the reach of heritage access beyond ‘traditional’ sites.

Keywords: Mobile Cultural Heritage, Notifications, Seurasaari Island, Heritage, Non-Primary Heritage Access, Explore

1 Introduction and Related Work

Accessing digital cultural heritage resources is often considered within the context of a visit to a museum, gallery or other similar place. Such sites might often be considered as ‘traditional’ heritage sites. They have clear entry and exit points, which are usually controlled in some way (e.g. by charging an entrance fee). They are also clearly advertised as supporting access to historical or heritage content (e.g. being labelled a museum, living museum, heritage park, etc.). Whilst visitors may visit these sites for a wide variety of purposes (e.g. taking

the kids to the museum to pass a rainy holiday), the common characteristics of traditional sites - in having to explicitly enter (and potentially pay to do so) and exit - mean that accessing cultural heritage is clearly a primary goal of the visitor, and they are dedicating time to it. However, Human-Computer Interaction, as well as heritage professionals, have begun to consider how cultural heritage can be communicated outside of these ‘traditional’ heritage sites. In part, consideration that “*heritage is not the historic monument, archaeological site, or museum artefact, but rather the activities that occur at them*” [1], has led researchers to consider how everyday environments, including city centres [2] and other built environments [3,4], are themselves heritage sites and can be digitally enhanced. The consideration is that all of the environment is a cultural heritage site, which can be augmented with digital content. Individuals do not need to ‘visit’ the heritage site, they are always within it. However, in designing, studying and evaluating digital technologies in everyday cultural heritage environments the same assumption, that visitors have accessing cultural heritage as a primary purpose of their visit and are dedicating a significant period of time to do so, may not hold. For example, Betsworth *et al.* [3], in considering the digital heritage solutions for a disused copper works, noted how a number of people passing through were not focused on the heritage of the site, but were just using the area for a walk, cycle or run. They note the importance of developing solutions that engage these users. More recently, Han *et al.* [2] developed an ‘app’ to investigate how local residents would record and contribute to the cultural heritage (e.g. with photographs, comments or stories) of places in their community *in-situ*. Although their focus was on curating the cultural heritage of a community, how to access that content *in-situ* is an obvious extension. In the practical use of such heritage applications, it cannot be assumed that all users would either be visitors (and thus new to the area) or, more importantly, have accessing cultural heritage as a primary part of their visit (in the same way as when visiting a ‘traditional’ museum site). Whilst visitors may be open to experiencing or learning of cultural heritage, their main goal may be a pleasant walk or jog (e.g. from Betsworth *et al.* [3]), or going about other everyday business (such as going home from work, or to the shops - such as with Han *et al.* [2]). It is not clear how digital heritage applications should be designed, or would work, in such situations. Whilst individuals may not be actively attempting to engage in the cultural heritage of the area, they may be open to finding out about it as a part of everyday life. It is this we argue, that drives the need to consider evaluation of digital cultural heritage where it is not the primary focus of users.

Existing work has developed solutions to be used in non-traditional heritage sites. Reid *et al.* [4] developed a location-based mobile app that triggered audio vignettes of the Bristol riots of 1831 as a visitor explored the same public square in Bristol where the riots occurred. Szymczak *et al.* [5] developed a mobile Android app to support both sighted and visually impaired users to experience a multimedia tour of the history of Lund, Sweden. However, in evaluating how such heritage applications are used, researchers often pre-recruit participants and arrange a time and place for them to carry out the evaluation. In doing so,

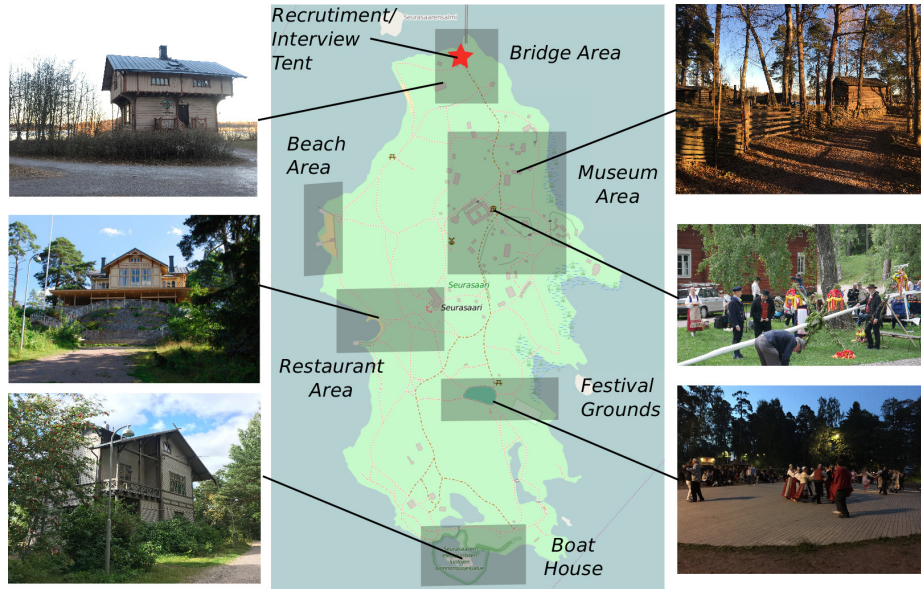


Fig. 1. An overview of Seurasaari Island, with images illustrating the key areas that we augmented with Explore. Map image ©OpenStreetMap contributors.

as with explicitly entering a museum, the participant has set aside time explicitly to carry out the study; making this their primary goal. There is no work that considers how individuals who are interested in heritage, but where it is not amongst the primary goals of their activity (as it would be in a ‘traditional’ heritage site), would use a digital cultural heritage application. It is unclear how the digital heritage application would be incorporated around the primary activity, or the issues in doing so, and how it should be designed to support such interaction.

We take the first steps in doing this through the design and evaluation of a mobile cultural heritage application, called Explore, that considers its use as a clearly secondary purpose for a visit. We firstly outline the site we augmented - the Finnish recreational island of Seurasaari - and how it is both rich in cultural heritage but attracts visitors for a variety of purposes, before outlining our design of Explore and its evaluation.

2 Seurasaari Island

Located in central Helsinki, Finland, Seurasaari Island (see Figure 1) was founded as a recreational park in 1889 [6]. It is permanently open and free. Visitors arrive by foot over a footbridge linking the mainland to the island. This serves as a common entrance and exit point, but has no barriers, gates or signs that mark the island from its surroundings. The park contains an open-air museum [7],

founded in 1909, with traditional wooden buildings (such as a farmstead, church and homes) relocated from other parts of Finland. These are integrated into the wider park, with the main paths around the island cutting through the museum area. Whilst the museum grounds are part of the park, and any visitor can walk around the exterior of the buildings, visitors must buy a ticket (a small worn sticker) to enter the buildings. Though not all are open.

Whilst the open-air museum is a major attraction for visitors, the park has significant natural and cultural heritage itself, with buildings dating from its founding as a park that house a cafe and restaurant, as well as the boathouse used by visitors to reach the island by steamboat before a bridge to the mainland was built. Ponds that are now home to rich wildlife were originally dug to extract clay for significant buildings in the city. This is coupled to intangible heritage, where the island hosts cultural events, such as numerous folk dancing and music concerts during the summer. Whilst these are often free, they are irregular and not widely publicised. The island also hosts traditional midsummer and Easter celebrations each year. This mix makes the island popular for both locals and tourists. For tourists, the open-air museum is a key attraction. For locals, the many kilometres of walking paths in nature make the island popular for walks, jogging and general relaxation. However, beyond the open-air museum, the rich cultural heritage of the island remains invisible to both.

3 Explore

We worked with the Seurasaarisäätiö foundation (www.seurasaarisaatio.fi) - who manage the island - to develop a mobile ‘app’ intended to reveal this hidden cultural heritage to visitors (both tourists and locals) whilst visiting the island. The foundation wanted the ‘app’ to focus on the wider ‘hidden’ cultural heritage of the island. In this way supporting both locals and visitors to gain new insight into its history. Whilst this included the open-air museum, it also focuses on the history of the museum itself, rather than the lived experience of historical characters in the museum (e.g. such as Ciolfi and McLoughlin [8]). As previously discussed, it is important to consider the primary goal of the user may not be to experience cultural heritage. The ‘app’ should therefore not be the primary focus of the visit (such as with McGookin *et al.* [9] or Szymczak *et al.* [5]), rather respecting the varied reasons individuals visit the island, and support free exploration rather than a directed tour [5].

Our final design, called Explore (see Figure 2), ran as an application on an Android mobile device. We choose to augment 6 main areas of the island (see Figure 1), although some content was placed outside these. Historical images and videos from the foundation’s archive (both with text descriptions), as well as audio vignettes describing something about the activities of a place recorded as if spoken by historical people, were geo-located at relevant locations in each area. The app used the on-board GPS unit to define activation zones (between 10-30m) around real world locations. As a user entered into an activation zone he/she was presented with nearby digital content. The use of activation zones is a common

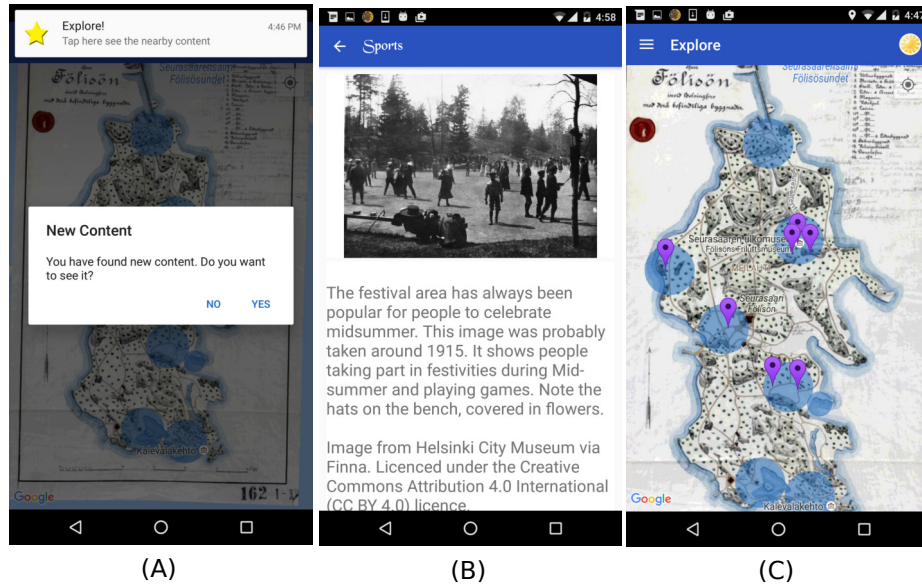


Fig. 2. Screenshots of the Explore interface. A: Notifications used the standard Android notification system, and if the app was active, presented this via a dialog on-screen. B: Responding to a notification presented the content (either an image, video or audio recording). C: Previously viewed content was marked on a map and could be viewed at any time.

technique, and has been used in existing cultural heritage work [10]. As a user entered an activation zone, Explore presented a standard Android notification (using a notification sound and vibration). These are familiar to users, and a standard way that applications create awareness of available content to mobile users [11]. As the use of environmental sound has been effective in other work [9], we also incorporated a low level ambient soundtrack in each of the 6 main augmented areas to highlight that there was content there. For example, a folk music track was played in the festival area. A mute button was provided in the app toolbar to switch this off if desired.

On entering the activation zone, a standard Android notification was presented (see Figure 2 (A)). Note that the screen did not need to be on for the notification to be presented. If the screen was off, the user could activate the notification from the Android notification drawer like any other notification. If Explore was active (Explore was the current app and the screen was on), or the user decided to open the application rather than directly access the notification from the drawer, an on-screen dialog was presented (see Figure 2 (A)). Activating this caused a screen to present the digital content (either image, movie or audio. See Figure 2 (B)). The notification was then cleared (future notifications were not fired for this content), and a marker representing the content was placed on an historical map of the island (see Figure 2 (C)). This allowed the content

to be reviewed at any time. The user could also ignore the notification, which was automatically cleared after the user had walked 10m from the activation zone. This ensured that participants would not see content unrelated to their location. In discussions with Seurasaarisäätiö, they were keen to consider how seasonality (the significant variation between summer and winter at the site) could be incorporated into Explore. As such we tested two variants. Both had the same content (which included content relevant to summer and winter on the island) and worked in the same way as outlined above. However, they varied in how users accessed seasonal content. Roughly half the participants (evenly split between tourists and locals) used each variant. Whilst results did reveal significant information about how variations in seasonality should be included in content (as reported in McGookin *et al.* [12]), there was no difference between how the variants were used or for how long. We therefore combine them in our results and discussion and do not explicitly discuss the seasonal aspects in this paper.

4 Study Outline

Participants were recruited in groups as they arrived on the island. By doing so, participants had themselves decided to visit the island for their own reasons, and not necessarily to experience cultural heritage. Although by taking part in our study they were at least open to experiencing it. 45 participants (aged 15-79, mean 44.7 years, 24 female) in 26 groups (10 individuals, 11 groups of two, 4 groups of three and 1 group of four) took part. Our demographic questionnaire asked participant's nationality, if they lived in Finland and if they lived in Helsinki. If neither, then a free text box allowed them to state where they were from. The demographic questionnaire also asked why they visited the island that day. From these responses we classified 10 groups as composed of locals, with 15 composed of tourists (either Finnish or Foreign). One group was a mixture. This was largely based on living in Helsinki, with the free text visit purpose showing a clear divide between these two groups. Each group was provided with a Nexus 5X Android smart phone running Explore, and were given a short demonstration on its use. After that, participants were able to continue their visit. Participants were informed that they could use Explore as little or often as they wished, and they should return the device when leaving the island. We also instructed participants they should not reduce or cut short their visit to return the device. When participants were ready to leave the island they returned the device and were given a short group interview. Each participants was compensated with either a Moomin mug or movie ticket (approx. 11 Euro). Interviews were transcribed and thematically grouped using a framework approach [13]. These supplemented instrumented logging of Explore application use.

5 Results

5.1 Differences Between Tourists and Visitors

A clear code in our analysis was considering the difference between tourist groups and local groups. Tourist groups discussed how they had made an opportunistic decision to visit the island, often that day. This was based on a number of factors, but included their overall goal for the day (PG5 (tourist): *“I thought about a combination of something like a museum and being in nature and outside would be good.”*), and the weather conditions (PG20 (tourist): *“the weather was very fine.”*). Whilst most had accessing cultural heritage as a primary part of their visit, that heritage was described solely as the open-air museum and its buildings. In comparison, Explore provided the heritage of the island as a whole. This reflects that there may not be a distinction between cultural heritage, and not, as a primary goal of users, but also between different layers of that heritage. Local groups also often made opportunistic decisions to visit the island, but their goals were described as relaxation, such as having a walk, or a pleasant passing of time with a friend (PG3 (local): *“we also visit just to walk around with the kids, so fresh air. And recreational or whatever it’s called”*). In considering both groups, we consider locals as having a clearly non-primary goal in interacting with heritage. Tourists being more focused on heritage, although that heritage is of the open-air museum and not the island as a whole. From log files, locals spent less time on the island (Locals M=66min S.D.=20mins, Tourists M=150min S.D.=42min). The differences were also seen in the GPS traces where participants walked. Locals largely walked a path around the island, usually around the coast. Whilst they walked through the open-air museum (as the main path runs through this area), they did not stop or dwell at it. Tourists however, focused their explorations on the open-air museum, with large GPS jumps illustrating when individuals went in and out of the buildings. In the following sections we discuss both locals and tourists together but highlight differences where appropriate.

5.2 Intergroup Tensions

For each group we supplied one Android device. As 16 of the 26 groups of participants contained more than one person, we were keen to understand how one device within the group was managed, and how the group used it. In practice the device was largely controlled by the participant who was most interested in its use, and by extension the heritage content. This ‘in charge’ participant would often directly interact with Explore, and then communicate either by reading, or by showing the screen to others in the group. Often this participant would curate, or restrict the content that was communicated to others in the group. PG10 (tourist) who noted that although she responded to all notifications, she curated what was shared with her partner: (PG10 (tourist) *I: “Okay. So did you always decide to respond to the notification or...” R: “Yes, I did always. And sometimes I stopped him and tell him to listen now.”*). This curation was often

used as a way to manage varying levels of interest in heritage between members of the group, with the ‘in charge’ user curating content based on interest. That individuals in a group have a varying interest in heritage is also common in traditional museum environments. However, we argue that as heritage becomes a less primary purpose of visits, the variance between members of a group will become greater. For example, PG21 (local) highlighted this particular point, and although it is the only code which clearly revealed a tension between members caused by Explore, it did highlight that engagement within groups is an important consideration: *“I was carrying it and she would have liked me to silence it offline. Was annoyed by the sounds but I said that we have to.”* Engagement can also vary over time. PG26 (local) noted how his partner had become less interested over time: *“I think they just looked at it in the beginning, but after that she was carrying our grandchildren more than this application. I took care of this.”* In considering use more widely, such as solutions in a city centre (such as envisaged by Han *et al.* [2]), engagement in the heritage may vary significantly on each visit an individual makes to the environment. For example, the importance of an individual’s accessing of heritage in the same location would likely be significantly different if she was running to catch a train to work, or was taking a leisurely stroll to meet a friend for coffee. How to take these variations into account in the design of heritage applications remains an open question.

5.3 Weaving Use into the Visit

In taking Explore into use, both locals and tourists described interaction in the same way. Explore was used when it provided a notification (PG25 (tourist): *“Every time it buzzed I said yes and I read what it provided me. That was about it.”*). Whilst a few tourists described how they opened the app occasionally to view the map (see Figure 2 (C)), unless there was a notification, participants did not interact with it. Participants also described how they felt able to ignore notifications if it wasn’t convenient to access them (PG5 (tourist): *“...it’s more up to me if I pass something or if I miss something. So it’s okay”*). However, participants ignored a relatively low number of notifications (M=3.7 S.D.=2.9 notifications were not responded to per visit out of M=42, S.D.=17 notifications fired). So most notifications were accessed at some point.

Notifications could also be seen as being disruptive to existing activities, where they might interrupt an on-going conversation (PG11 (local): *“sometimes in our conversations, when we were talking, then [imitates a beep] again.”*). Such disruption was more often discussed by locals, and more often discussed about areas where there was a higher density of content, and therefore more notifications. For such users, where accessing cultural heritage is a clearly secondary goal of a visit, it is important not to present too much content or present it too often. Such issues were not so much discussed with tourists, who had a clearly greater focus on cultural heritage during their visit.

In using Explore, participants (particularly locals) were clear that it did not affect where they chose to go on the island, and did not change the purpose why they visited (PG11 (local): *“No. We walked the route we had planned”*). Tourists

expressed the same view. Though some did note how awareness of the map in Explore (although not often directly accessed the map (see Figure 2 (C)) was the main view of the application and was seen when closing notification content) encouraged them to visit beyond the open-air museum area on the island. Unlike existing ‘tour’ based guides (e.g. [5]), where individuals visit locations in a set order, when accessing cultural heritage as a clearly secondary goal the cultural heritage application must be sensitive to, and fit with, the primary goal of the user, and cannot make assumptions on the order in which individuals will visit locations. Participants were clearly not open to having Explore direct their visit.

5.4 Immersion in Content

A final important code was the level of immersion that participants wanted with content. As participants interacted only through notifications, and because of the potential distraction from their primary activity (e.g. having a walk) in accessing these, immersion within the content was at a lightweight level. Apart from videos, participants often read the persona text in Explore rather than playing the audio files. As we did not give participants headphones for the mobile device (this would have created isolation issues [14] and made sharing difficult (see Section 5.2)), audio was played over the phone speaker. However, only two groups mentioned the impact on others nearby of this, and one group noted how they were not bothered by the reaction of others. However, environmental audio, used by prior work to enhance the feeling in an area [9, 15, 16], and used in Explore to contextualise the content in each of the six marked areas we augmented, was often muted by participants as soon as it started being played (or participants turned down the volume control on the mobile device). Log files showed that the number of instances where participants activated the mute button for environmental sounds ($M=3.4$, $S.D.=4.7$) was similar to the number of activations of those sounds ($M=3.4$, $S.D.=1.4$). Participants were also of the view that rather than such sounds being an ambient soundtrack in the background, they should not be long and only played for a short time (PG3 (local): *“It was just for the moment okay, now I know that, I don’t need to listen to it for a long time.”*). Overall, when considering cultural heritage access as a non-primary activity, interactions should be lightweight and do not offer the more immersive possibilities that have been studied at other sites (e.g. augmented reality [9, 17]) where heritage access is a primary goal. In reference to our discussion in Section 5.2, it may also be that as the degree of engagement an individual has in heritage will contextually vary, solutions should provide access to the same content with varying degrees of immersion. Whilst this may include highly immersive content, such as augmented reality, from our results it is clear that low-immersion, lightweight and fast interactions with a system to access heritage content must be supported.



Fig. 3. As future work, from the discussion in Section 5.2, and using a similar approach to Explore, we are considering everyday access to cultural heritage sites in more urban environments (such as Helsinki city centre), where individuals may not always be present for leisure (A). We are also exploring both the level of engagement by introducing physical and tangible interaction ‘crates’ that supplement areas of the island and work in conjunction with Explore (B).

6 Discussion

Results have highlighted how the use of digital cultural heritage applications is impacted when used in contexts where accessing and learning about cultural heritage is a clearly secondary purpose of visitors. Such understanding is important as researchers begin to consider how non-traditional heritage sites (such as parks, city centres and other public spaces) can be augmented with digital cultural heritage. Our findings illustrated how individuals were both interested in learning of the heritage of Seurasaari Island (as they took part in our study), but were not willing to let that interest determine or control the purpose why they visited the island. Explore was used only as a companion, and was interacted with only when it had something to present. Participants did not review or go back to previously seen content. In places where Explore tried to provide more immersive experiences, such as presenting contextual environmental audio, this was quickly muted. Participants were willing to have Explore come along to enhance their visit, but not to define its purpose. Although we identified two general categories of users, with a greater (tourists) and lesser (locals) primary focus on cultural heritage, we identified fewer differences between them than we expected. There are several possibilities why. Firstly, locals were engaged in recreation, so may have been more willing to engage with Explore during their visit. In a city environment (such as envisaged by Han *et al.* [2]), individuals may have more dynamic and variable willingness to engage with a cultural heritage application during the day. Accessing content may be spread over multiple visits with several weeks between each, rather than over the few hours spent on the island. As locals were all engaging in recreation during their visit, their time was flexible and allowed engagement with Explore. Alternatively, whilst the

lightweight interaction with Explore may have been the maximum level of engagement locals would have tolerated (given their interview comments), tourists may have been more willing, at least at times, to deepen engagement with Explore.

In future work we are exploring both of these. Firstly, by developing and evaluating an Explore like application that works in the city centre of Helsinki, and provides *in-situ* discovery of historical images taken in the vicinity (see Figure 3 (A)). Secondly, we are enhancing Explore (as discussed in Section 5.4) to support deeper engagement with content through tangible ‘crates’ that activate in the same way as the notifications in Explore (see Figure 3 (B)). For example, presenting audio through an old rotary telephone that rings as a user approaches, or emitting the scent of a bonfire when Explore notifies of the midsummer tradition. By doing so we will be able to better understand these issues.

As digital heritage applications are extended beyond traditional sites, it becomes important to consider why individuals are at those sites, and how important accessing cultural heritage is for them. Our results have shown that even if cultural heritage is not the primary purpose of a visit, individuals may still be open to learning about it. However, such digital heritage applications must be considered from this perspective, supporting fast, lightweight interaction, and not attempting to guide or direct users along tours. Our study of Explore takes an important step towards realising ubiquitous cultural heritage access.

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