

Challenges for the Technological Augmentation of Open-Air Museums:

Bridging Buildings, Artefacts and Activities

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Abstract: *This paper reports research and design work focused on enhancing visitor experience of an open-air museum, Bunratty Folk Park in County Clare (Ireland). We will discuss how existing work in the domain of museum technologies has so far dealt little with open-air sites. Our approach aimed at developing themes of participation and visitor contribution at a site that differs from indoor exhibitions on the grounds of size, structure and material on display. We will describe the background research and design research towards an interactive multi-device installation entitled “Reminisce” for Bunratty Folk Park, informed by a focus centred on visitor activities and their experience of place. We will then provide examples of visitors’ interactions with Reminisce in order to show how this approach can lead to successful design interventions.*

Key words: Open-air museums, interaction design, place, interactive installation.

We present a design case that was conducted as part of a feasibility study for the introduction of Information and Communication Technologies (ICTs) at museums and other visitor attractions. An integral part of the project was the investigation of current visitor experience at one particular site, and the development of design recommendations and scenarios. The project was conducted in partnership with business/marketing experts and telecommunications engineers. Our role was that of envisioning new tools and services that would bring added value to the visitor experience of a heritage site. The particular perspective we adopt is that of

Human-Computer Interaction and Interaction Design, whereby technology is always designed from the point of view, needs and requirements of users and participants. The design approach includes examining the nature of visitor movements, social interaction and participation in the visit to a particular site, and – based on this understanding – developing ideas for technological augmentation. The project’s initial timeframe of twenty months allowed for a substantial amount of empirical fieldwork at Bunratty Folk Park, an Irish open-air museum displaying historical buildings, and for a number of design workshops. Subsequently, a

16 follow-up project grant made it possible to develop and deploy an interactive installation on-site for the purposes of user evaluation.

In the follow-up grant, we conducted a series of design workshops inspired by our fieldwork in the Folk Park, followed building incremental prototypes leading to the final interactive installation, that we titled “Reminisce”. “Reminisce” experimented with integrating multiple interactive components (including mobile phones, audio displays and tangible user interfaces) into a visiting trail through the Park.

In the following sections, we will present the research grounding for our work, followed by an overview of results of empirical work conducted on site to show how themes of participation are crucial when understanding the visitor experience at Bunratty Folk Park and at open-air museums in general. We will subsequently describe the design work carried out for the site, highlighting the novel interactional qualities that our final installation, “Reminisce”, offered to visitors, and conclude the paper with some discussion of the results emerging from testing “Reminisce” with the public.

TECHNOLOGY FOR OPEN-AIR MUSEUMS: OPPORTUNITIES AND CHALLENGES

Open-air museums are a very popular visitor attraction worldwide¹. They are interesting settings for technological augmentation, as they retain many of the qualities of “traditional” museums (organised in room-sized exhibits), but also present different challenges, such as their out-of-doors nature, the different physical path and time frame of the visit, the importance of location and of movement between different buildings and corners of the landscape. Place making and

dwelling are also important aspects of the visit to an open-air museum, as these sites exhibit buildings and man-made landscapes that can be *inhabited* by the visitors, who can also relate to the original inhabitants and their way of life in that environment. Moreover, the individual objects are displayed in a richer context (compared to the “standard” exhibit case in a gallery, which is by its own nature displaced from its original and/or appropriate context) making the connection between lived place experience and artefacts on display more evident than what can be achieved in self-contained exhibits.

Both the HCI/Interaction Design and museum communities have produced extensive literature documenting case studies of the introduction of interactive technologies in museums and exhibition sites (see for example Grinter *et al.*, 2002; Sparacino *et al.*, 2000; Hsi and Fait, 2005, etc. to mention but very few well-known examples). However there is a need to extend current theoretical and practical approaches to guide such design interventions when considering sites that are spatially distributed and that are structured in ways different from the traditional one-room, one-exhibit approach typical of traditional museums.

Whereas the majority of research on the use of portable devices (mobile guides, in this case) refers to indoor exhibition sites (see for example Aoki *et al.* 2001), and recently about the use of visitors’ own mobile phones in these settings (Samis, 2007), some work has been conducted with respect of outdoor visitor experiences, such as field trails in cities or at other sites, rather than open-air museums proper.

Recent endeavours have focused on the use of smart phones in support of outdoor visitor

trails. Paterson *et al.* (2010) developed a Viking Ghost Hunt game trail for the City of Dublin, based on GPS technology, offering players the overlay of a playful theme for their visit to the city centre. Another example is the Culloden Battlefield visiting aid (Pfeifer *et al.*, 2009), which was developed with the goal of making GPS guide tools a commercial success, offering little in the way of reflection over user needs and design process.

The “visit as game” scenario is not the only one to have been explored. Another significant area to have been researched is that of the social dimension of the visit, and of the sharing of individual experiences to some extent. In their paper describing mobile shared visitor experiences at London Zoo, O’Hara *et al.* (2007) discuss aspects of bookmarking and socially sharing relevant “milestones” during the visit, arguing how incorporating the social aspect in the design of a personal device helps foster engagement and social interaction. Collaboration was also inscribed in the design of city games (for example Brown *et al.*, 2005) which had the goal of not guiding participants, but rather to extend their experience of a city with an added layer of social interaction and engagement.

The visitors’ own active role and contribution to outdoor trails has also recently been discussed. Giaccardi and Palen (2008) reflect on the role of cross-media interaction in the experience of a community project that allowed participants to overlay their physical journeys in an area with sound “snapshots” for reflection and sharing. Similarly, Walker (2007) discusses social sharing of the visit in “MyArt Space”, where tagged objects that participants selected in their visit to several museums become a personalised “history” of the visit.

The majority of these examples have

employed mainly mobile solutions for use in visitor trails, often incorporating elements of collaboration and sharing. Others have looked at alternative technologies. Pletinckx *et al.* (2000) and Schnädelbach *et al.* (2002), for example, suggest Augmented Reality and Mixed Reality as appropriate technologies to support visitor interpretation of outdoor sites, where visitors could operate a VR “scope” to view reconstructions of buildings in the surroundings of the viewing station. Of course, these technological aids are limited with respect to their position on the site, not really providing support throughout an extended visit.

Most of the settings featuring in the examples above are not curated. The only two examples of installations documented in the HCI community that were specifically aimed at open-air museums were the photo-tagging system developed for the Valle Crucis Abbey in Wales (Baber *et al.*, 2008), which involved visitors taking pictures of the site during the visit, but which supported all interaction post-visit through social tagging; and Kylä, a room-sized exhibition on the theme of historic photographs and folk music for the village of Viena Carelia in Finland (Ilmonen, 2007), where visitors can trigger the display of visual and auditory content by approaching “sensitive” corners of the space by candlelight. Kylä does not allow for any collaborative interaction and works on a standard information-delivery mode, although the input device is quite novel.

Overall, there is a need for a more focused view on open-air museums, which are a common attraction in many countries, and could hugely benefit from recent developments in location-based services, geotagging and powerful personal devices as described in the brief review we have presented above.



Fig. 1. Some images of Bunratty Folk Park.

Also, there is a need to consider solutions alternative to mobile devices only, as certain limitations of mobile technology have been highlighted – isolation, detachment from the setting – and could be overcome. Mobile devices alone might cause people to detach themselves from the exhibits, and often the mobile content provided is disconnected from the place. Open-air museums offer an interesting environment for the consideration of how mobile personal devices could be used in synergy with standalone interactive installations and information points to provide a more seamless visitor experience: to not have visitors concentrate only on the mobile device, but to keep the focus on the site.

The features of open-air museums already include elements of active engagement, which could be extended and augmented through design: for example the role of human animators showcasing activities and engaging visitors in conversation and discussion are a common feature, important to “draw the spectator in”. Open-air museums are ideal sites to experiment with user participation, building on the interaction with animators, the experience of “inhabiting” the exhibit and the multi-sensory aspect of the visit that sometimes lack in other settings.

Our research differs from other work both on the explicit focus on understanding the situated visitor experience at an open-air

museum for the purpose of design, and on the attention towards participatory elements that engage visitors.

In the following section, we describe the empirical work we conducted at Bunratty Folk Park and discuss some main findings that informed our design.

EMPIRICAL WORK AT BUNRATTY FOLK PARK

Bunratty Folk Park recreates aspects of Irish life of the past 2 centuries through a collection of 32 original historic dwellings. At Bunratty, the landscape, the buildings, their contents and the activities taking place in them thanks to human animators, are all elements of a complex display that visitors encounter in their wanderings around the Folk Park (Fig. 1).

Here we provide an outline of the main findings of the extensive field studies at the site. This is important to show what aspects of the visitor experience at Bunratty Folk Park represent design opportunities, and to provide a description of the context in which our design was deployed and evaluated.

The overall qualities of the visit are different from enclosed museums and resemble more closely outdoor experiences such as city visits. At the same time, however, the “content” of the site is of a museological nature and so it should be approached when thinking of design interventions: dwell time, distance between the exhibits, switch in proportions between sites and between indoors and outdoors (e.g. visiting a building entails both observing its architecture as a whole, but also exploring its contents, the décor, the objects, etc.) are all crucial aspects to be considered when thinking of additional layers of digital content and services. We have also noted interesting challenges in the curatorial and interpretation

practices of such a large, diverse and multifaceted site.

METHODOLOGY

In our work, we adopt a theoretical and methodological approach focusing on situated experience. This presents some common points with the tradition of ethnomethodological studies of social interaction and collaboration around exhibits, that highlight the social nature of visits, and articulate the unfolding of visitor activities surrounding exhibits, with an eye to inform or evaluate design (Brown, 2005; Vom Lehn *et al.*, 2001; Galani and Chalmers, 2002). This approach contrasts with more traditional visitor studies, where an exhibit is “measured” in terms of its ability to attract visitors to stop in front of it and the length of time it is able to hold them there – the “dwell time”. However, these examples of work do not display a grounding in the physical nature of exhibitions, leaving out contextual and situational factors that have an impact on how a site is approached: the material qualities of a site, its sensory characteristics and its cultural identity. In our work, we look at visitor experiences as they are grounded in the experience of place: the lived experience of the physical world at personal, social, cultural and physical levels (Ciolfi and Bannon, 2005). We feel that in the case of this particular project, it was important to approach the study of Bunratty Folk Park with a view to understanding situated experience. Our approach is also inspired by the Falk and Dierking model of interactive museum experience (Falk and Dierking, 1992), in the sense that each layer of place experience (which can be compared to the “contexts” outlined by Falk and Dierking) is “continuously constructed” by the visitors: “Whatever the

20 visitor does attend to is filtered through the personal context, mediated by the social context, and embedded within the physical context” (Falk and Dierking, 1992, p. 4). The museum experience is at the intersection between these dimensions, and all of them play an equal role, and good design should be mindful of them all.

We applied such frameworks to our work in Bunratty Folk Park, where the importance of including the aspects of the physical context in the visitor experience is paramount, including movement through the site, dwell time and the

possibility of physically entering the objects on display (the buildings).

In order to collect data, we employed qualitative methodologies. We conducted observation sessions, both documenting visitor behaviour at particular sites that are attracting notable hubs of activity (such as, for example, the Golden Vale Farmhouse, where baking demonstrations take place regularly), and accounting for the entire trail around the Park. This was accomplished by shadowing several groups of visitors as well as engaging them in informal conversations. We also involved the

Fig. 2. Different types of spatial environments and different levels of crowdedness at Bunratty Folk Park.



Folk Park staff in our study, by interviewing some of the animators and observing them in their activities.

SOME EMERGING THEMES

Overall, the visitors' responses to the site are very positive: people enjoy the atmosphere and the exhibits, with many visitors return to the Folk Park for further visits. The open and informal nature of the site encourages social interaction among visitors and groups, particularly when facilitated by the animators. Discussions among visitors regarding the buildings and objects on display are commonplace, thus showing the engaging nature of the site. When developing a design strategy for the introduction of interactive technology, a number of particular issues need to be considered for the appropriateness of technological interventions at the site. The main findings of our fieldwork (which have been described more in detail in Ciolfi, McLoughlin and Bannon, 2008) can be articulated around the following themes:

- *Spatial distribution and paths*: there are several critical issues regarding the physical journey around the Folk Park, which is long and may be exhausting, especially for people with reduced mobility. Many visitors converge on the village main street where the shops and bar are located, whereas some other sites are less visited than others. In open-air museums this is a key factor in how visitors will plan their explorations, particularly if the weather is inclement. There is a social element to this as well, if a group of visitors include children or elderly people, who tire more easily and might not be comfortable with exploring the entirety of the site. Integrating technology mindfully into the ongoing activities of people as they

move through the site means being aware of the physical demands of the site. Visitors could potentially be encouraged to explore further, or could receive a glimpse of what they have decided not to physically visit.

- *Availability of Information (Fig. 3)*: fieldwork revealed that the information available to visitors on the different sites of the Folk Park is quite insufficient. Beside a map/guide leaflet, which is distributed to all visitors on their arrival, there is only a minimal amount of information presented at the different sites to inform visitors what these sites represent. From the observation of visitors, it has been noticed that there is often little understanding of what the sites represent, and sometimes misunderstandings arise in relation to the specific function of certain artefacts. A dearth of information was observed about the distinct aspects of each of the Bunratty Folk Park buildings (for example, the fact that these buildings were originally from different regions): to a visitor who is not familiar with history and heritage, many sites seemed similar, the differences between the sites that make them unique from each other (in building style, furnishings and decoration) were not made clear. Considering the nature of the open-air museum, also many of the signs and information items that do exist are positioned in problematic locations where they go unnoticed by many visitors. Overall, the availability and use of existing information around the sites needs to be considered further, particularly regarding the scale and layout of buildings, and how people approach them; and it is an issue that may require a targeted re-design intervention.

- *Demographics of visitor groups (Fig. 4)*: Bunratty Folk Park attracts many different groups of visitors, varying in age, nationality



Fig. 3. Poor-quality signage at the farmhouses.

and group size. People's experience of the visit, therefore, varies greatly. For example, senior visitors and those old enough to remember certain artefacts and environs from their youth relate to the exhibits in a different way compared to younger visitors: their personal memories of being in houses such as those on display at the Folk Park, or using farm tools, brings the exhibition to life in a way that cannot be replicated for younger visitors (particularly non-nationals). This indicates that a way for visitors to share their thoughts and comments around the exhibits would be important in the engagement of all visitors and will help increase the understanding of the relevance of what is to be seen.

- *Human help* (Fig. 5): A central feature of Bunratty Folk Park is the presence of a number of staff members, who provide animation at different locations around the site. The Bean An Ti's ("woman of the house") are the most significant group of characters in this

respect (a minimum of five is always present on site). The presence of "characters" animating buildings is a very important element shaping visitors experience of the Folk Park. The staff

Fig. 4. Older visitors discussing their experiences using traditional farming equipment.





Fig. 5. Some of the animators from the Park.

members are very skilled in engaging visitors in conversations and discussions, as well as presenting interesting information regarding the buildings and artefacts. “Hands-on” activities are also attractive to visitors. The work of the characters must remain crucial in bringing the environments and artefacts to life for the visitors: the tangible experience of the building and objects, the possibility of socially discussing them and of expressing one’s own opinions and ideas about them is at the core of visitor experience.

- *Maintaining the character (Fig. 1):* The concept of Bunratty Folk Park is to recreate scenes from national history through the reconstruction and presentation of buildings and sites representing the way in which people lived in previous centuries. The developers of the Park have gone to great lengths (in many cases relocating entire buildings and refurbishing them with authentic artefacts) to recreate each scene so that they are faithful to their original historical context. The role of human animation of certain sites, such as for example the Bean An Ti described earlier, is

that of further conveying the character of the building and of its original setting. The design and deployment of technology needs to be mindful of this quality of the place, and to consider strategies to achieve a good integration between the site and the technology, particularly regarding the latter’s physical design.

These themes provided a basis to begin the development of design concepts. In subsequent design sessions, they were used as points of discussion on the nature of the visitors’ experiences of the Folk Park.

In the following section, we describe how these salient issues characterizing the visitor experience were used as a basis for conducting design sessions for the creation of the installation.

DESIGN SESSIONS

Firmly grounded in the fieldwork conducted on site, two brainstorming workshops were carried out focusing on the development of concepts and the generation of scenarios for

novel interactive installations that would encourage visitor participation and sense making of certain aspects of Bunratty Folk Park. Colleagues from our group and other researchers with experience in interaction design practice and an interest in cultural heritage, but not involved directly in our project, were invited to participate. All the participants had been to Bunratty Folk Park at least once and were familiar with it as visitors.

The space for the brainstorming sessions was prepared with excerpts of the data collected from field studies displayed around the space, this data included: aerial images of the Park and images of the sites, artefacts, animals and human activities; excerpts from interviews with the visitors and snippets of video footage the

taken from a walk around the Park; key words related to the major findings from empirical work.

We started with a discussion of the fieldwork and the salient issues that arose from the data fieldwork data. Then the sessions moved on to brainstorming activities, where the participants were asked to generate key words and concepts relating to the site. These were then pooled together and arranged on a board (see figure 6) in the space so participants could discuss the concepts and to develop links between them.

From an early stage in the brainstorming, it could be seen that the concepts put forward could relate to different levels of support for the visitor experience:

- Concepts that provide a foundation for



Fig. 6. Discussion and Concept Board.

Concept Theme	Description
Interactivity and variety	Using a mobile device and based on the visitors' interests, a variety of different information could be presented to the visitors as they move around the park. The information would be in the form of short pieces of textual, graphical and audio data. At the beginning of their tour around the Park, visitors could set preferences on the subjects they could get information on (farming, transport, etc).
Memory / stories	Presenting or recalling to the visitors' memories and stories regarding the sites and artefacts in the Park. Two types of memories or stories were considered: the visitors' own personal memories that they could leave in the space, and historical archival records represented through photos, film, audio recording and written documents.
Collecting things	This scenario involved the visitor building a representation of a particular character or aspect of the Park through collecting items that form individual parts of the representation. This could be a historical image or postcard that is divided into puzzle pieces that the visitors could collect at different points around the Park. In order to collect a piece, the visitors would have to do certain things like talking to the animators, touching objects, etc.

activities: collect things, game, recall memory, geocached, guidance, follow a path, the day of a fisherman/farmer, etc.

- Different types of *information spaces*: visitor generated content, event location (Is something on? Where? When?), a personal codex, timelines, everyday life, objects that tell a story, object (what am I, where am I from), tell its story / history, etc.
- Types of relevant *technological artefacts*: camera, audio recorder, RFID, mobile phone, etc.
- *Interaction techniques*: touch it, interact with animators, etc. (Fig. 6).

At the end, three potential design concepts emerged:

The design team evaluated these concepts based on the level of engagement that could be offered to visitors, particularly on the potential to involve them in active participation and appreciation of the material qualities of the site. One of the common observations to emerge

from the discussion was the limitations of both standalone installations (such as kiosks in certain parts of the Folk Park) and of mobile aids (such as visitor mobile guides), if thought of in isolation. Standalone installations would look disconnected and slightly out of place; a mobile aid alone would support the idea of "trail", but might lead to a disconnection from the place and its qualities.

As museum technologies are heading toward a new type of convergence, whereby "clouds" of devices, information and access points provide a digital layer of content and services that overlays exhibits, the design concepts started to revolve around the idea of a multi-device installation, which would feature both standalone elements and the use of visitors' personal devices, such as smart phones, and the integration of social/shared media functionalities to connect visitors to the site also before and after their visit.

The team agreed that a multi-device

26 installation could be an effective solution for an open-air site such as Bunratty Folk Park, where there is a need to provide insights into the individual “objects” on display as much as to create a coherent narrative bridging different buildings, locations and layers of content.

The final scenario involves visitors collecting memories about particular activities (butter making, turf cutting, etc) from 19th century characters who would have lived in the sites in the Folk Park, “Farmers of the Land” and “Women of the Houses”. These memories are “placed” at different sites in the Park, and, as visitors progress and collect them, they are given clues about where they can find more memories. Visitors have the opportunity to leave their own memories or comments about the sites or activities and to listen to memories or comments that other visitors have left. Visitors could buy-in and out of the activity as they wished, and they did not have to follow a strict path. They could be guided by the clues that were available at some sites, or they could serendipitously engage in the activity if they entered a site that was annotated with memories. In this way visitors could be immersed in the historical context of the site without the system disturbing the flow of their visit. Creating a relationship between the visitors and the places where people would have lived was the objective of the installation: through listening to characters reminiscing about their lives at the site, visitors could be given an insight into their lives in the context of the historic houses. The houses would not simply be buildings, but rather scenes of experiences of times past.

The primary audience for the installation was Irish visitors and visitors of Irish descent, statistically the most significant group to visit Bunratty Folk Park. Other visitors who could

speak English could also appreciate the installation.

In terms of added value, we developed ideas for allowing real-time contributions to the experience. This is an important innovation on other trail-based museum installations and it fits into a major trend in current museum research (Simon, 2010; Meisner *et al.*, 2007), and an approach to visitor support that we have pursued in our previous research (Ciolfi, Bannon and Fernström, 2007).

In the following section we will describe the final design of the installation, presenting in more detail its components, navigational structure and mechanisms for participation.

“REMINISCE” IN THE MAKING

The final installation, “Reminisce”, was deployed in Bunratty Folk Park in August 2010 over three full days. Due to its exploratory nature, visitors could try the installation free of charge and we provided all the accompanying materials. The installation consisted of an array of interactive technologies each supporting specific parts of the activity.

- When visitors entered the Park they were directed to a central “portal”, here they could create a unique profile where all the content they collected and recorded during their visit would be stored. They could also select which character they wished to hear memories from, and receive an initial clue about where to find the first memory from this character. The portal was also where they collected the mobile device that they used to gather the memories. At the end of their trail, visitors would come back to the portal, where they would be presented with a map of their visit annotated with the memories they collected and recorded. Finally, the portal allowed



Fig. 7. The central portal.

them to share this content with family or friends through email or social networking sites (Fig. 7).

- At the portal visitors were given a mobile

phone, as they travelled around the site they could use a specially developed application to collect memories at specific sites and record their own memories.² At the different sites, the memories were represented by QR markers, which could be scanned using the camera on the phone. The codes would trigger an audio recording of the character's memory at that site to be played on the handset. Then, if they wished, visitors could record and save in real time their own memories or comment using the handset's microphone (Fig. 8).

- The portal provided visitors with the first clue about where to find the memories from their specific characters. Subsequently, at each of the memory sites, visitors could collect specially designed packs of tangible

Fig. 8. Visitors using the mobile device to listen to a memory after having scanned a QR marker (on the wall on the left of the image).



tokens, containing a souvenir that they could bring home with them and that were connected with each site (bread recipes, pieces of turf, small hanks of wool...) and a clue about the next site where they could find memories. The purpose of these packs was threefold: to provide the visitors with a memento of their visit, to guide them to the next memories available to them, and to allow them access the memories that other people left at the site. The clues were printed on cards with RFID tags embedded in them, when they reached the schoolhouse, the last site on the “Reminisce” trail, they could use the tangible tokens as input for the interactive desk in the schoolhouse (Fig. 9).

- In the schoolhouse, the last site on the trail, an interactive school desk allowed people to listen to recordings that other visitors had left at the sites in the Park. Placed on the desk were books with embedded RFID tags, each of them related to one of the characters that visitors could collect memories from. A book holder and a basket with embedded RFID readers were also placed on the desk. When

Fig. 9. The tangible token packs.



Fig. 10. (Press 22/Don Moloney) The interactive desk in the schoolhouse.

one of the books was placed on the holder and one of the tangible tokens was placed inside the basket the recordings left by other visitors were played back. These recordings were of the site that the tangible token was collected in (Fig. 10).

- A web resource allowed visitors to share their experience of the site after the visit. It provided visitors with a map of their visit annotated with the memories they collected from the character they were following and the memories or comments they would have recorded (Fig. 11).

“Reminisce” was available to visitors for trials for three full days during the Bunratty Folk Park regular opening times. During this time, approximately one hundred people used the system at different degrees (e.g. from taking a full tour, to a partial one, to using some of the individual components at the different sites). We collected data regarding their experiences through observations, shadowing and informal interviews. At least three people from our team were always present on site to facilitate the participants and monitor the equipment.

“Reminisce” provided the visitors to

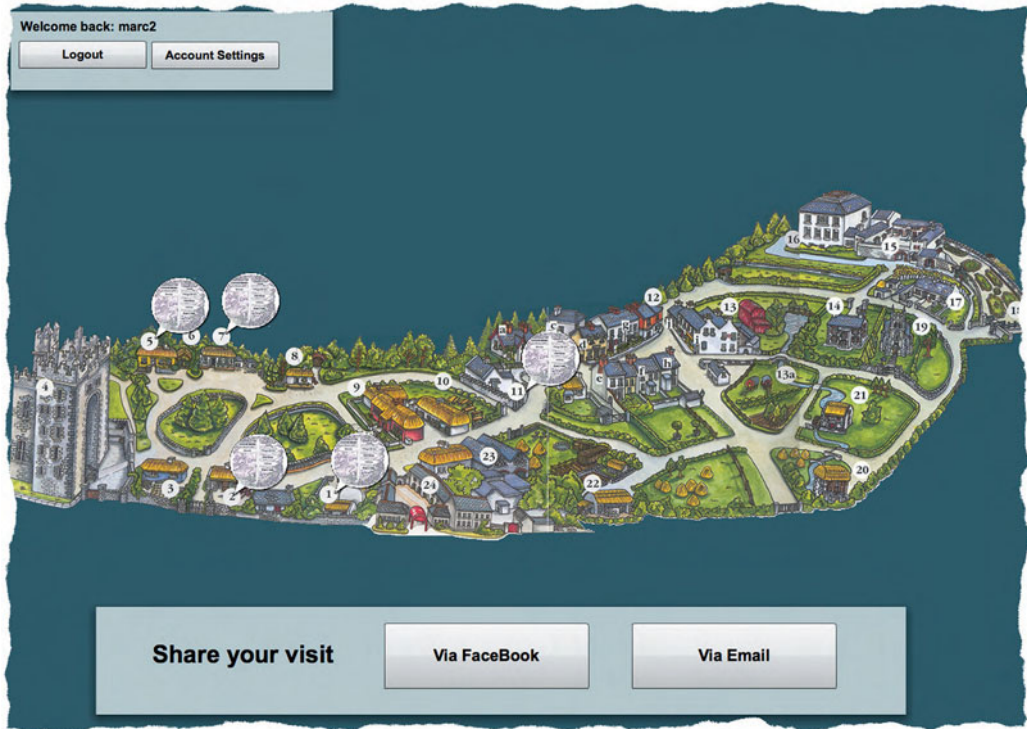


Fig. 11. The web resource.

Bunratty Folk Park with a unique experience: differently from other systems designed for outdoor sites, it mixed a variety of components to maintain a link to both the physical, perceptual qualities of what is on display and to the wealth of digital information that enriched the visit. Related work has shown how the combined presence of tangible artefacts and of a digital layer of information overlaid on to physical artefacts is effective in sustaining visitor engagement at exhibition sites (Fraser et al., 2003; Koleva *et al.*, 2009). This was maintained in our design, but the innovative elements include the connection to the material qualities of the site (the identity of

each of the houses and the artefacts that are identified with it), the attention to the physical design of the installation so that it could retain at least partially the character of the site, and the ample opportunities for participation that the array of components of “Reminisce” afforded to participants (Fig. 12).

DISCUSSION AND CONCLUSIONS

At Bunratty, the core to the added value of “Reminisce” was in the design focus on the lived nature of place: all the elements of “Reminisce” presented material, cultural and social connections with the environment, from



Fig. 12. A group of visitors on the “Reminisce” trail collecting a memory at the Forge.

the content they provided, to the shape and material quality they took, to the ability to encourage social interaction and sharing on the nature of the Folk Park. This is a completely new approach to design compared to previous research explorations.

The character’s memories provide visitors with human perspectives on the “lived” aspects of the sites to complement the material qualities of the spaces, something that other trail-based systems also offer. However the installation also allowed for a high degree of personalisation in each component. The mobile phone enabled participants to create their own content at the same time as accessing

their character’s memories, and the two activities were coupled to suggest to visitors that their contribution was as important (Fig. 13).

The tangible tokens were given to visitors as personal souvenirs that all participants happily took home and used often during the trail as a tangible “trigger” to conversations and discussion even when not directly used to operate one of the “Reminisce” components. They provided a tangible connection to the “lived in” aspects of the spaces with a direct reference to their “feel” and character: something that many visitors find one of the most engaging feature of Bunratty Folk Park

The interactive desk introduced a further

shared element into the visit by linking the individual tokens with other participants' contributions. This allowed visitors to gather different perspectives from other visitors about what they experienced during their journey around the Park. Finally, the portal and web resource provided visitors with a way of reviewing their unique trail in the Folk Park, providing them with an overview of their journey as well as with the entire set of memories generated in their visit, making their experience at Bunratty something that they could share to some extent, and re-visit afterwards.

"Reminisce" is a novel example of advanced interactive installation (e.g. moving away from simple delivery of content through a device) explicitly designed for an open-air museum. We aimed at bringing an interaction design approach mindful of the visitor-situated experience to the setting of a rich exhibition site that includes a variety of dwellings, artefacts and activities and is organised into a complex physical trail.

Fig.13. Visitor recording content.



The lessons learned in the process, and that can be useful insights for other designers and/or museum practitioners working in a similar setting, include the importance of understanding in depth the material qualities of the artefacts on display, in order to create interactional possibilities that resonate with the lived experience of visitors in the context of an open-air museum – which makes the possibility of inhabiting the site their most attractive quality. Several examples of installations have been deployed at open-air visitor attractions, but often maintaining a detached status from the physical layer of the place. Although "Reminisce" is not a permanent installation yet and could only be tested for a limited time, the response we received showed that it had a significant impact on the visitor experience. Participants actively engaged with all the components, and their interactions with and around the system attracted interest from other visitors and members of staff.

These results show how important it is to follow a design process that is centred on situated activities in order to achieve a successful and engaging installation. The design features that worked in a particularly effective way include:

- Matching digital qualities with material qualities: introducing elements that link the layer of digital interaction introduced into the site with its "authentic" characteristics. The use of low-tech components can work very well in this situation, giving visitors the opportunity to engage with simple and accessible artefacts and not overload them with high-tech gadgets.
- Maintaining variety and surprises: "Reminisce" assembled a number of components and modes of interaction. It provided for small surprises to be found at each site (things would always be slightly different at

32 each of the houses), although anchored to one overall narrative guiding visitors. The school house was the backdrop for a dedicated piece inspired by the setting itself: the interactive desk where people could browse through social memories. Overall “Reminisce” allowed for variety of interactions and of content provided, keeping visitors interested and entertained.

- Facilitating participation: the participatory component of “Reminisce” was one of the strongest reasons for its success. The ability that visitors had to contribute in real time with a personal layer of information to their character’s story was greatly appreciated by all who tested the system. Numerous recordings were made and re-played for the benefit of companions. The interactive desk also provided a “live” display of other visitors’ stories, and the opportunity of “stepping out” of the characters’ storylines and into those of the participants. We are planning to further develop the functionality of sharing the visit through social media in order to monitor more fully the life of the visitors’ trails post-visit, including the comments that would be received, other forms of sharing such as re-posts, and the references to Bunratty Folk Park encouraging new visitors to explore the site.

With “Reminisce”, Bunratty Folk Park became the setting for unique visitor experiences, thanks to the possibility of recording personal content, as well as increased social interactions due to the theme of the installation. People compared their memories and discussed their knowledge of the past while exploring the houses, and appreciated the additional dimension of the personal character stories that were overlaid on the physical structure of the buildings. As an experimental case, it provided the research team with the opportunity of testing a design approach as

well as a technical demonstration, and of learning a useful lesson on design for public engagement in an open-air museum.

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NOTES

1. A comprehensive directory of open-air museums in Europe does not exist. However, ICOM, the International Council of Museums, has recently endorsed AEOM (<http://aeom.org>), the Association of European Open-Air Museums, and EX-ARC (<http://www.exarc.net/>), the international organisation of Archaeological Open Air Museums and Experimental Archaeology, which brings together open-air museums of an archaeological theme. Another related group is ALHFAM (<http://www.alhfam.org/>), the Association for Living History, Farm and Agricultural Museums, with members predominantly from the USA.
2. If visitors’ phones supported it, this application could also be downloaded and installed on their phones but this was not achievable in the time frame of the project.

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