

Placebooks: Participation, Community, Design, and Ubiquitous Data Aggregation ‘In the Wild’

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Abstract. This paper outlines and describes the development of a multi-media data aggregation system called Placebooks. Placebooks was developed as a ubiquitous toolkit aimed at allowing people in rural areas to create and share digital books that contained a variety of media, such as: maps; text; videos; audio and images. Placebooks consists of two parts: 1) a web-based editor and viewer, and 2) an Android app that allows the user to download and view books. In particular, the app allows the user to cache content, thereby negating the need for 3G networks in rural areas where there is little-to-no 3G coverage. Both the web-based tools and the app were produced in the English and Welsh languages. The system was developed through working with local communities using participatory approaches: working ‘in the wild’. Placebooks is currently being used by a Welsh Assembly Government project called the People’s Collection of Wales/ Casgliad y Werin.

Keywords: collaborative work, Community computing, Electronic publishing, Participatory design, Quality of life and lifestyle.

1 Introduction

In this paper we outline the development of an application called Placebooks. Within this short paper we give an overview of the Placebooks system before progressing to consider the approaches that we have used in regard developing and designing this ubiquitous multimedia data aggregation system ‘in the wild’. This brief introduction opens the paper, but is complimented by an overview of the system following on from the introduction. The core focus of this research related to the development of IT systems ‘in the wild’, this paper introduces the system that was developed and gives a brief insight into the approaches that developed as part of the design and development of the system in a rural context.

2 Placebooks

Placebooks is the product of a research project having a brief to explore the development of up-to-date digital solutions that would enable people to map rural spaces in a similar way to that in which Alfred Wainwright mapped the Lake District – i.e., through the use of various media and personalised accounts of place. The result is a ubiquitous computing toolkit that allows people to create, publish and share digital books about the places they visit and inhabit – see www.placebooks.org. The system allows users to embed various types of digital content including video, audio, photos, web pages, maps, routes and sensor data alongside text to create personal digital books about places. The system is currently bilingual using both Welsh and English.

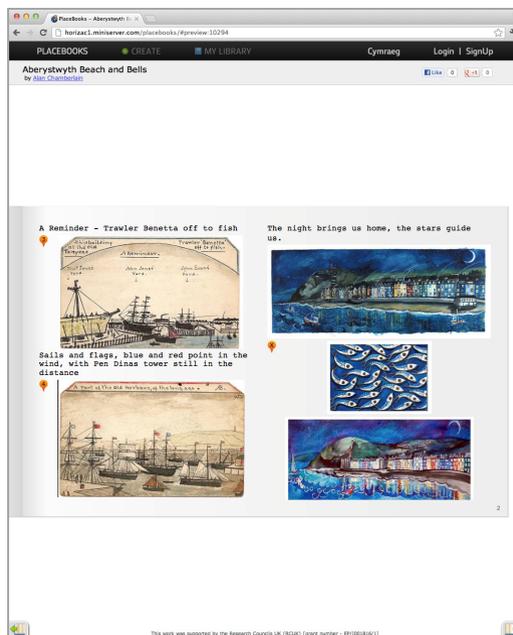


Fig. 1. A user's Placebooks about Aberystwyth

A user's books are organised and stored in their own Placebooks library. Each Placebook can be shared within a group or global network. A user can browse for public Placebooks from an archive and add elements of other people's Placebooks to their own. They may also add content from other online sources and services to their Placebook and they may specify access rights and privileges to allow other users to add content to a Placebook. A mobile app enables users to access Placebooks 'in the wild' for viewing and navigation, and they can search for nearby Placebooks based on their current location.

Placebooks is predicated on a collaborative model that exploits a map-based user-interface to filter an archive of Placebooks on the basis of the activities they represent (e.g., cycling, bird watching, walking, etc.), local knowledge they articulate (e.g., local history, flora and fauna, archaeology, etc.), and services they provide (e.g., places to eat, places to stay, places to buy goods, etc.). The system has 4 key parts:

- A web browser-based interface for authoring and viewing Placebooks.
- A mechanism for linking external data sources to Placebooks.
- A mobile application for viewing Placebooks.
- A server-side infrastructure for managing Placebook construction and use.

2.1 Web Interface

The initial design for a Placebook was based on a tri-fold leaflet metaphor. This is a single A4 size canvas, which is made up of 6 panels (3 on the front, 3 on the back). However, this was re-designed into the book-like editor that can be seen below in Fig. 2. Although initially the leaflet editor was developed, stakeholders involved in the co-design process started to suggest that it might be more appropriate to move to a book-based metaphor that one could flick through and share. Other stakeholders were asked about the metaphor change and the design was developed. In this respect we can see how engaging the stakeholders in the design process lead directly to changes within the system.

The web interface first requires individuals to create their own user account in order to make a Placebook. Once an individual is signed up, they can access the Placebooks editor. The editor enables users to create and manipulate Placebooks via a simple GUI. A ‘palette’ metaphor provides access to digital media items that can be ‘dragged and dropped’ on to the visual book canvas. Digital media can be added from the user’s computer, from online sources, and third party service providers. Each book has the option of including 25k Ordnance Survey (OS) OpenSpace maps. Every item in a Placebook can be represented as a geo-point on a map. When users have finished creating a Placebook, they can ‘publish’ it to share with others.

2.1.1 Publishing

Once a user starts to use the editor to make their Placebook, the system will auto-save the book. However this version of the book is not seen publicly until the user decides to publish the book. Once the book is published it is then available to all users of the system and can be downloaded by the mobile part of the system. If we look at Figure 3 it shows the editor’s library view, unpublished books are all blue and published books appear with the orange marker on their cover.

Editing rights can also be shared. A user can invite other users to co-create a book if the original author wishes. This means in practice that a book can have many co-authors that may be working on creating the content for one book.

Once the book is published it can also be shared (as a published item) through Facebook and Google+.

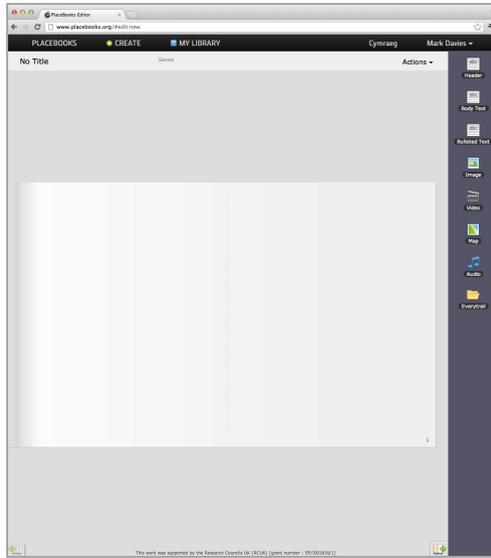


Fig. 2. The book web interface

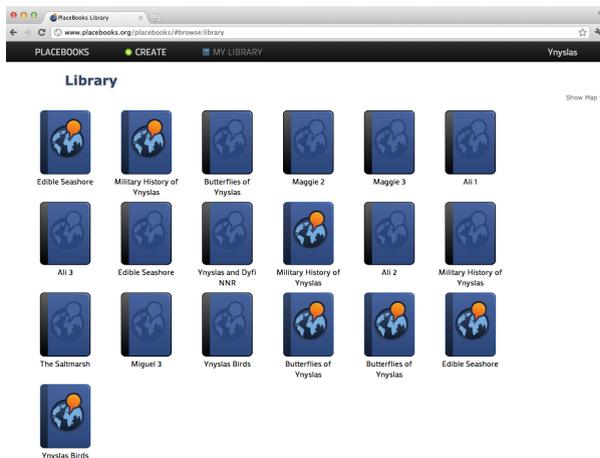


Fig. 3. The Editor – library view

2.2 Linking External Data Sources

We currently support two third party service providers:

- *EveryTrail*, a popular mobile phone application that enables people to record GPS trails and geo-tag content, including photos and videos.
- *People’s Collection Wales (PCW)*, an online archive for creating and sharing geo-tagged content.

The linking component allows Placebook users to synchronise their EveryTrail and PCW data with the editing palette to add content to books they are creating. The PCW data currently includes routes and geo-tagged images.

2.3 Mobile Application

The mobile application enables users to take their Placebooks ‘offline’ and into areas without data connectivity. Placebooks are represented in a ‘bookshelf’ GUI, from which users can select and download books to the mobile device. These downloaded Placebooks are then available for viewing within the application, which adapts the content to the device they are displayed on. Currently an Android app is available for download at Google Play (search for Placebooks). An iPad app is currently in development. Figure 4. gives an example of the way that the Placebook is rendered onto an Android phone. The first picture illustrates an example of the user’s library, while the second shows an example of the content that is presented to the user.

Users can search for nearby Placebooks relative to their current position and download these books to their bookshelf. Placebooks can also be searched by ‘type’ (e.g., surfing, walking, eating out, etc.), allowing users to quickly find the Placebooks that interest them.

Map items in a Placebook are stored as map tile images. When a Placebook gets downloaded to a mobile device, the map image tiles get cached on the phone to enable them to be used in areas without data connectivity. If the mobile device has GPS enabled, then a You-Are-Here (YAH) marker will appear on the map and update its position in relation to the user’s movement.

Different types of geo-tagged media are represented on the map by using small, touchable icons to match the data type they represent (e.g., video, images, audio).

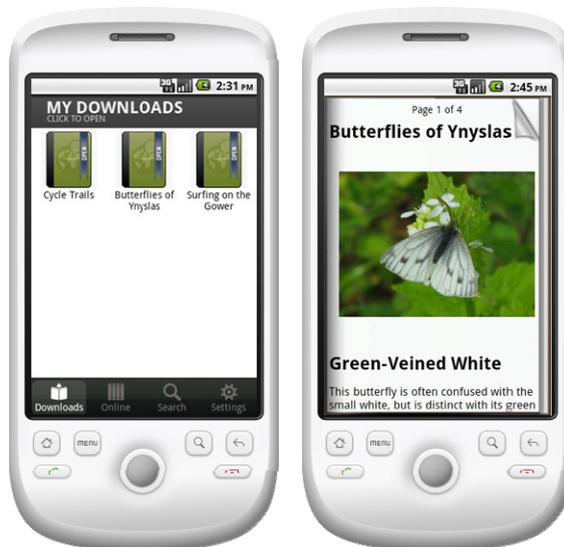


Fig. 4. The Placebooks mobile app

2.3.1 Mobile Maps

Many smart phone apps that use maps rely on mobile 3G services to update the map tiles, so as users move from one place to another the map tiles are updated, they are not stored locally. By delivering mapping services in this way, the user needs to have a connection to the map server, yet within many rural areas in the UK there is little to no 3G-coverage, meaning that many mobile apps relying on map-based services are of little to no use. In order to remedy this we developed a method to cache map tiles locally on the mobile device to allow the user to access map tiles without the need of a data connection to a map server, whilst in-field.

2.4 Server-Side Infrastructure

The server-side, cloud-based infrastructure offers a variety of services for the web interface, mobile application and linking of external data sources. It provides the system's media data types (e.g., video, audio, maps etc.). It also provides database persistence capabilities for storing and retrieving these data types as they are converted from external data sources, authored, retrieved, and so on. It provides the 'bookshelf' and packaging service that translates a user's Placebooks collection into a format that the mobile application component may interpret. It can also provide the account structure. It offers a publishing mechanism, which copies a given Placebook into a new instance that is accessible to other account holders as well as non-account holders. It provides textual and locative search services.

Placebooks is a free-to-use service that has been taken up by the People's Collection Wales (PCW) to support its core business activities. PCW is an innovative bilingual digital platform that aims to collect, interpret and display the history of Wales, its culture and heritage. PCW encourages individuals and community groups to contribute to the archive, alongside cultural heritage institutions. The Ramblers, the largest walking group in the UK, are also exploring the use of Placebooks, in their ongoing efforts to map rural Britain.

3 Development Practices

Placebooks was developed through a broad set of inputs, including input from individual members of the public having diverse practical interests in rural places, public organisations, and project partners (including geographers, cartographers, ethnographers, HCI researchers, and software engineers). In addition to the methodological approaches exploited by project partners – e.g., ethnographic studies [1], concept design, and mockups – systems development was driven in significant respects through 3 key design practices: action research [2], the collective resources approach [3], and agile [4] approaches. Within this paper we are not able to fully expand upon these approaches in an appropriate manner, so have decided to briefly expand upon the way that we used Agile approaches in the project, as we feel that this would be of most interest to the targeted community.

3.1 Collective Resources Approach

CRA is a Participatory Design (PD) approach to design that explicitly privileges the views of the worker. In using the term “worker”, CRA refers to the community that is worked with (often through the medium of workforce unions and their plans) in order to affect a beneficial change for the good of the workforce, and in so doing prevent the workers being exploited in the workplace by the capitalist system that creates conflict within the workplace arena. The CRA aims to engage the workers in the design process through the workers not only being the object of study, but also through them co-operatively working with PD-based designers. In order to accomplish this, both the design team and workers take part in workshops, feedback sessions, prototyping, demos and so on. This method of co-design is seen as having a democratising effect that mitigates the inherent conflict (seen by CRA designers) existing in relation to the workers’ struggle for workplace democratisation in the capitalist system. In terms of practice it could be said that CRA extends upon AR by taking a left leaning approach, but still retains ‘design by doing’ [5] as a core practice.

For a fuller discussion of PD methods see Voss et al (2007, Chapter 2), and Muller et al (1993) [6], for a PD taxonomy overview.

Although we have borrowed certain elements from CRA in our approach to design, we were not involved in using these methods to enable the democratisation of the workplace through design as we earlier stated. However, when we further examine the literature relating to the CRA it can be seen from the list below [5] that we have been engaged in activities that are CRA-based. The list below shows the elements of the CRA that we have used within our engagement.

- design by doing;
- using languages that are familiar to the participants;
- design as mutual learning;
- participation in design as enjoyable;
- design as situated.

Key to our approach was enabling the community to directly respond to the research, input into the design and evaluate the system as we went along (co-operative evaluation). In this regard we were doing research with the user, for the user, and with the users - having their interests at heart. By taking this design approach and working with a range of stakeholders (with diverse and overlapping) interests, it is important to emphasize a degree of flexibility when responding to their situated interests and needs. These may not necessarily be the designers’ interests but those of the stakeholders’, and to plot a path between the varying interests that stakeholders may have.

In using this approach we were able to initially develop a concept, working with stakeholders in the wild, rather than bringing them to labs.

Actively being in the community and working with people showing them paper prototypes, discussing ideas and feeding back to the development team. What worked, what didn’t, what was understood and what wasn’t and what they themselves could see as working for them.

This work with stakeholders in the community informed and added to our initial mix of ideas based around a project brief, that was originally shaped around interests in ‘interpretation’ from the Countryside Council for Wales and geographic interests in ‘vernacular’ maps and user-generated content from the Ordnance Survey. We also carried out ethnographic studies of the work-practices involved in visiting places.

As the system has developed the Peoples Collection Wales, a national peoples’ archive have decided to use the Placebooks system and test it in its beta format in order to add it to their toolset (as part of the collection). This interest has enabled us to work with them and has also allowed them to think about the design of their own system and what the best way may be for the public to use tools to provide content to their national archive. This continued interest has also led to shaping the continued development of Placebooks and interest from their international partners and UK partners (the Ramblers) as a platform that they could use.

3.1.1 Limitations of Collective Resources Approach

Although CRA has influenced the way that we have been working, collectively, both as a team and with the communities, we did not use CRA as initially intended [3]. What in fact enabled the community to engage in design was action and reflection upon the activity they were engaged in. By giving the community a highly developed prototype, as previously stated, they were able to use the prototype and use the experiences gained from interacting with the prototype as a platform from which they could engage with the design process. We did not treat our engagement with the communities as having any sort of political agenda or as using a methodology for “democratic innovation” [7].

Indeed this would have been difficult to do if we had intended to work with them as a group, a majority of the engagement happened at an individual/family level. Meetings often occurred in the domestic context of the person using the system. As people lead busy, and sometimes complicated lives, it was appropriate to meet people in a place and time that they stipulated and not attempt to corral people in workshops, design studios and labs (this also fitted in with the, in the wild ethos of the project). Although this took more time, it became apparent that once people had invited us into their home, they were more comfortable with our presence. This also gave the in-situ researchers a more intimate understanding of the people they were dealing with. When working with the organisational members, who worked in the wildlife centre, they were often there as a group, and that is how we worked with them. In that context, people came and went, as required by their work schedules.

It is important to stress that within this approach we also took note of the expertise within the research team, that was made up of researchers (ethnographers, HCI researchers, software engineers) with multiple competences allowing us to pull on a range of knowledge and expertise, and it was this weaving together through using a collective competence and collective problem solving that related heavily to the ethos of CRA.

This allowed us to collectively pool the resources of both the community and the research team in order to design and develop appropriately. This collective problem solving approach meant that, unlike other general models of systems development, [8] we did not end up with an isolated division of labour. That is to say, that sometimes researchers whose expertise was programming would come to work in the field, in order to get first-hand experience of the research environment, ethnographers would sit-in on technical discussions and all of the team would actively engage in design. We found that it was important to have people coming and engaging with the community and doing fieldwork because they were able to get directly involved. Without this direct involvement the researcher is at a disadvantage: they are at a distance from the phenomena that they want to understand.

4 Conclusion

Within this paper we have given a brief overview of the system and discussed some of the issues that we have encountered whilst developing the Placebooks system, we have also expanded upon the CRA approach that we employed to accomplish this. Although this is a short paper, we hope that this overview will act as an introduction, prove useful to the community, and in particular to those people that are developing systems for use in rural areas unlike many pervasive technologies that have focused upon urban settings (8,9). With an ever-growing archive of Placebooks it will be possible to further understand the users' motivations for creating content, the types of content that they create and how the system's use develops at a future point in time.

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References

1. Crabtree, A., Rouncefield, M., Tolmie, P.: *Doing Design Ethnography*. Springer (2012)
2. Hayes, G.R.: The Relationship of Action Research to Human-Computer Interaction. *ACM Transactions on Computer-Human Interaction* 18(3) (July 2011)
3. Ehn, P., Kyng, M.: The Collective Resource Approach to Systems Design. In: Bjercknes, G., Ehn, P., Kyng, M. (eds.) *Computers and Democracy - A Scandinavian Challenge*, pp. 17–58. Avebury, Aldershot (1987)
4. Beck, K., et al.: *Manifesto for Agile Software Development*. Agile Alliance (2001), <http://agilemanifesto.org/> (retrieved September 6, 2012)
5. Voss, Hartwood, Ho, Procter, Slack, Rouncefield, Buescher (eds.): *Configuring user-designer relations: Interdisciplinary perspectives*. Springer (2007)
6. Muller, M.J., Wildman, D.M., White, E.A.: Taxonomy of PD Practices: A Brief Practitioner's Guide. Special Issue on Participatory Design, *Communications of the ACM*, 36(4) (June 1993); Muller, M., Kuhn, S. (eds.)

7. Yndigeegn, S.L., et al.: Mobilizing for community building and everyday innovation. In: 2011 CHI Workshop. ACM (2011)
8. Chamberlain, A., et al.: Locating Experience: touring a pervasive performance. *Personal Ubiquitous Computing Journal* 15(7) (2011)
9. Chamberlain, A., et al.: Them and Us: an indoor pervasive gaming experience. *Entertainment Computing Journal* 4, 1–9 (2013)