

# INNOVATION IN THE WILD: ETHNOGRAPHY, RURALITY AND COMMUNITIES OF PARTICIPATION

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## ABSTRACT

This paper presents a series of insights, discussions and methodologies relating to our experiences gained while carrying out research ‘in the wild’ in order to drive IT-based innovation within a rural context. It draws upon personal observation, ethnography in a real-world setting and related contexts, in which the authors have carried out research. The research work presented is novel in that we took a stance in which we asked the stakeholders to co-realise the methods we adopted in order that they might participate in the research with us. However, this was not necessarily the most effective way of working with the communities. We also discuss the problems associated with working with disparate communities of interest and working with people on an individual/familial basis as opposed to traditional participatory workshop-style methods. To further contextualise the research: the system that we developed was based on the creation of personalised digital books – the project was conceptualised around letting people ‘map’ the ‘unmapped’, thereby providing local understandings of both people and place.

## INTRODUCTION

To introduce the paper we have chosen to present a brief overview of our position in regards to the research. In order to understand the existing practices (in relation to the context of the work) of the stakeholders we initially used ethnographic methods. This was done so that we would be able to innovate in an appropriate, understandable way and work with the community in a sustainable manner, so the IT-systems that were co-produced could fit with the existing practices of the said community. A failure to do this could have led to a rejection of the system and a refusal to work with the research team. Within the project we engaged with a number of communities: research, governmental and the local community. This strategy was adopted because of the nature of the system being produced, which we shall expand upon.

Many IT-systems cannot be successfully run by a lay community, both in terms of the skills needed to operate such systems at a technical level and because of the costs associated with running such systems. We needed to engage with a number of stakeholder communities and for the innovation to occur as part of this multi-stakeholder participation. In order for our system to be adopted (post-engagement) the design needed to gain ‘traction’ with larger governmental organisations. The organisation that we worked with was able to further have input into the project and enabled us to gain further participation from ‘experts’ within the field that we were working.

Towards the end of the project the system was adopted by a nationwide organisation, which was able to host the system and maintain it, in order that a wide range of smaller organisations could use it. After the system was hosted it became apparent there were still many ways in which the system could be further developed and we have continued to input into the further design and the internationalisation of the system.

## PLACEBOOKS: RURAL PARTICIPATION

In this section we aim to give somewhat of a practical overview of the day-to-day issues that affected the participatory nature of the project, the methods that we used to engage with stakeholders and an overview of some of the issues concerned with the real-world nature of working in rural settings. We will give a brief overview of the system in order to give some context to the case at hand, but that is not the focus of this paper. Due to the academic and Human Computer Interaction-based leanings of the authors of this paper we will also expand upon some of the issues that concern themselves with software development in this context e.g. development methodologies, design and evaluation in order that we might not privilege any given perspective.

Placebooks was a system that allowed users to make their own digital books about anything, for example their interests or places they wanted to talk about (it is now hosted at <http://www.placebooks.org>). Users can add text, images, film, audio and maps. All of this data can be geo-located within the book and the book can be viewed either on a smart phone or as webpage. Once the book is put together, pages can be flicked through, either on a desktop computer or on a mobile phone. The books can be accessed live whilst one is mobile, or downloaded for later use in rural areas where there is a paucity of connectivity.

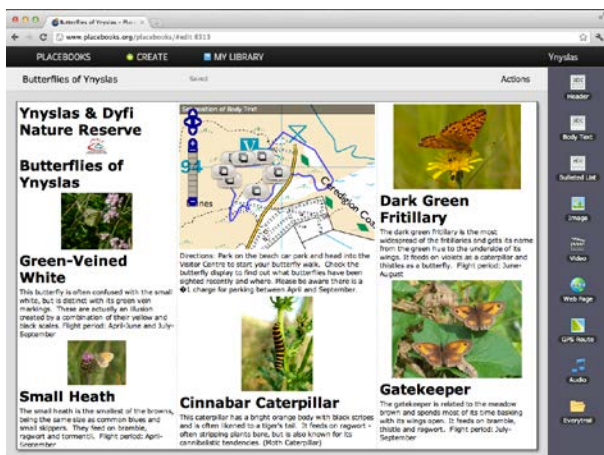


Figure 1. Making a of a Placebook online-editor

A key challenge of this project was to gain ‘traction’ both within the local community; a diverse community of varied practices and interests and also within an organisation that would be able to sustain engagement after the research project had come to an end.

The project took an approach that focused upon working with people in their own community spaces. In doing this, our attention was placed outside of the laboratory setting, which is often the site of design for many computer science-based projects, and instead we located ourselves within the stakeholders’ environmental setting.

The rural setting of our intervention impacted upon the research in a number of different ways. We didn’t

organise workshops, due to the dispersed nature of the population and the distances that some people might have to travel in order to attend. Seasonality played a role in when we were able to meet with people. For example, the nature reserve that we were working at as one of our sites of intervention closed during the winter and their staff were seasonal. Tourist-based business owners (and often their families who work for the business) were not available in summer as this was the busiest time of year in terms of tourist sales; in this regard many parents were also busy ‘entertaining’ their children during the summer-break. Many people often worked in the day too, so engaging this group of people would have been difficult. In order to accommodate for and fit in with the natural patterns of peoples’ behaviour we needed to take an approach that would enable stakeholders to participate in the design, which might lead to innovation. We took an approach whereby we asked the stakeholders the best way in which we could work with them. This was more often than not, meeting them in their own homes or in a local café. Corraling people in a workshop would not have worked in the context in which we were working.

The generalised, open nature of the project (we were open to anyone that was interested in representing something about their interests, activities or location) meant that it was difficult to have a focused user group or stakeholders with a common interest or focus, because of the diverse range of practices and interests that people were interested in articulating, instead people were simply linked through their geographical location. As part of the project we thought that it would prove valuable to carry out ethnographic studies at local sites that different groups of people visited in order to inform us about the activities that people engaged in, so we carried out scoping studies in which we visited local sites of interest, e.g. the beach, nature reserve and high-street in order that we could report back to the design team. This also allowed us to discuss what we had seen with the stakeholders that we were working with and gave us an appreciation and further sensitized us to the setting.

As one would expect we found that people used technology for a plethora of reasons, in a multitude of locations and took part in a large range of practices, but as Beck (2001) points out, the diversity of practices within a said community can create challenges for Participatory Design in the 21<sup>st</sup> Century. Within this context our approach was to focus our engagement upon individuals and to offer technological tools that could be used generically in order to let them reason about the use of these tools and feedback to us, so that we may understand about the nature of the services they might use, their provision, and inevitably feeding this back into the design of the system.

As a starting point to this we used wireframe sketches as seen in figure 2. that proved difficult for the stakeholders to understand as a full system, it wasn’t until we offered low fidelity mock-ups that they could

understand more about what we were trying to accomplish and participate in the design. At this point in the process one of the key tasks needing to be accomplished was keeping traction through action – keeping people interested, showing people new developments in order that they could feedback, getting the design team to respond and adapt to any developments in order that we could keep evolving the design. If this process stopped it would have meant that we would have had to re-engage people and the process of engagement would have slowed. Without stakeholder feedback it is difficult to further develop and engender innovation, but without the design team developing, in this case the software, it is difficult to get the stakeholders to feedback.

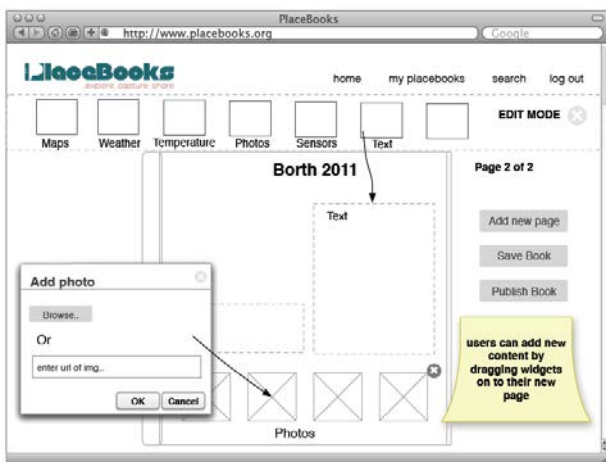


Figure 2. Wireframe illustration of interface

As we progressed into a phase of development where we were able to develop prototypes and get feedback from the stakeholders we found that the often taken for granted urban-centric model of *always on and always connected* did not fit with the context in which the system would be used. All too often many systems work on real-time upload and download, were very little data is stored on the phone. Through using our system in context and getting input from stakeholders we were able to remedy this problem by designing a system that took account of the ‘off-grid’ nature of the system’s use-context.

As previously stated, as part of the project we had a researcher working in-situ and programmers visiting the site in order that they could appreciate the setting. One of the many advantages of working in-situ was the *chance meeting*. In being ‘on-site’ doing the day-to-day activities that people do. Such as, going to the shop, walking from one place to another and getting lunch, meant that as fieldworkers we were able to come into contact with people on a regular basis in their own familiar settings. This was advantageous for many reasons, but importantly it let other people see whom we were talking to and that we were there, in some senses we became a physical part of that community (*of which we shall later discuss*). These chance meetings also let us keep up to date with what was happening, who was

using what, how, when and where? Were there any technical problems or issues that needed reporting to the development team, and were there any suggestions about how we could better improve the system (Hayes 2011).

These chance meetings also gave us an idea of who knew who, the way that the community worked together and it allowed us to keep people up to date with the project. In doing this we were able to keep people involved in the project, even if they weren’t actively participating in the project. There were people that didn’t take part, but equally they were interested in what was happening, being developed and the ‘knock-on’ effects that this could possibly have on them, sometimes these people were important in their roles as an intermediary between ourselves and other people in the local community, with them being able to signpost us to people and organisations that might engage with us, or telling us what to avoid. In-situ chance meetings have also happened at an organizational level. Meeting people ‘in the wild’ that live in the area outside of formal organizational meetings has meant that we have been able to quickly discuss things on the street that we might not have been able to previously, due to time restrictions, availability and organizational politics. Being able to have a happenchance quick chat has meant that friendly reminders, feedback and negotiation, have often happened outside of the ‘usual’ office/meeting room setting, usually at a one to one level.

#### ENGAGEMENT MECHANISMS

Here we present a short summary of some of the key lessons learned whilst working with communities of (multiple) interest in the wild, weaving them together with one another and interdisciplinary perspectives and research practices and how we responded rapidly to stakeholder needs; before we discuss the role that the Agile software development played in the development of the system.

List of approaches in order to build a *community of participatory innovation*:

- a) Opening up and exploring possibilities – collective design workshops (with the design team), use of mock-ups, and consultation with potential stakeholders (developing interest).
- b) Making possibilities concrete – move beyond proof of concept – join existing services together, developing generic infrastructure to support mashing up services that can be used in a generalised fashion.
- c) Creating traction - developing robust beta-level prototypes and rapidly evolving them as new requirements emerge – constant engagement with stakeholders and design/development team.
- d) Identifying, attracting and engaging partners that can sustain developing solutions – organisations that can sustain user engagement in the future.

## AGILE: RURAL AGILITY

Within the Placebooks project we used Agile software development methods. Agile is a software development method that focuses on iterative or incremental approaches, collaborative effort (within the development team and between the team and stakeholders/clients) and is highly flexible (agile) in being able to meet the changing needs of the stakeholders. Agile methodologies are not only for software development, but can also be applied to user-centred design (Sy 2007) and do not demand the over-documentation of the development process. Beck et al (2001) outline four key priorities over traditional software development strategies:

- Individuals and interactions over processes and tools
- Working software over comprehensive documentation
- Customer collaboration over contract negotiation
- Responding to change over following a plan

(Beck 2001).

Using Agile methodologies for in the wild settings works very well, being able to quickly adapt to new and emerging requirements is very important in order to keep people engaged and to enable the system to evolve. We found that within our project we were rarely dealing with a static set of requirements. The requirements for such projects were often in a state of flux, therefore an agile approach was needed in order to deal with these circumstances. More often than not the requirements that surface during the life of the project, as Greenberg and Buxton write (Greenberg & Buxton 2008), can lead to “innovation along new trajectories”.

Agile methods also, as we have seen, focus on *individuals and interactions*, “most practitioners already know that people matter more than process” (Glass 2001). It is this focus that enabled the research team to come together and quickly respond to the on-going and evolving requirement, without having to focus on large amounts of paperwork and planning. The team knew what they were capable of and what skills needed to be employed to carry out the work quickly and efficiently, and having people in-situ meant that we were able to pass information between the community and research team. This was often done using short iterations. When we combine this with our rapid, flexible approach, it is clear that this is what enabled us to deal with any issues that cropped up.

Traditional design/implement/test software development methods (as can be seen in Sommerville 2007) are often not flexible and have a very segmented, defined structure, in terms of the development process and the allocation of work. This happens on one level and often cannot deal with a series of parallel workflows as often happened when working in the wild. As Greenberg and Buxton (2008) propose, “...the design/implement/test loop, if done naively, encourages the sequential

evolution/refinement of ideas rather than the multiple parallel solutions that characterize most traditional design disciplines”.

This agile approach meant that we were able to rapidly construct prototypes with beta level functionality without having to spend too much time planning, over-documenting and following set processes/procedures.

Of course when using the Agile approach one has to be wary of the limitations of such approaches. One such limitation that we noted was that it forces prioritization. By this we mean that if something is suggested during the design process and the team decides to follow that design route then this can affect stakeholder participation, if for example systems are developed that are not wanted or understood. To further illustrate this point we would like to give an example. At the start of the project there was a push from groups involved in the project that what was needed was a variety of different technologies. A geo-sensor-based system, 3D maps, and whole range of situated display technologies, and for a short time we examined these as possibilities, prioritizing them as elements that would be part of, or the whole system. It wasn't until we engaged with more people that it became clear that this isn't what the stakeholders wanted, used, or for that matter understood. To avoid this sort of prioritisation we adopted an approach that we have afore mentioned as being related to the CRA, in which we could quickly discuss and evaluate the system through collective competences, both stakeholders and from within the design team.

## LAB-BASED DESIGN

In this section we will briefly expand upon Laboratory-based design in order that we might critique, contrast and compare this method of design and development with in the methods we used to accomplish innovation. We recognise that this is a broad field, so we will prioritise the most appropriate materials in order to focus our argument.

Lab-based design is carried out in a research lab space, more often than not away from the deployment site of the technology (if there is to be a deployment). This kind of setting is used for a variety of reasons, predominantly because it is a controlled space that can be manipulated and set up to meet the requirements of the design team. Within this space users/participants are invited in at the request of the researchers to take part in workshops, walk-throughs and experiments that are often at the request of the researcher. We must also take into account that as Rogers (2011) insightfully notes, research in the wild studies are expensive. The lab is essentially an artificial setting which is wholly independent of the context in which the eventual system/product may be used. This is to say that the laboratory is not the site of deployment and that users, who may not necessarily come from the area of deployment or indeed ever use the systems in

development are asked to take part in experiments etc., on the researchers' terms. As Shapiro (2010) states when referring to Coulter (1989) on why we should participate with users as socially sited, instead of as isolated individuals, "main stream computer science and psychology, fundamentally misconceive the nature of human action by locating it in the isolated individual." In regard to evaluation being part of the lab-based design paradigm it is sadly all too true that the individual is understood as an individual, out of context and un-situated.

Research in the wild should take an approach where the users are worked with, in their own settings and based on their own terms of engagement. Researcher intervention should always be at a minimum, where variables are not controlled and users are not managed in order to control the situations in which they are placed. Experiments outside the lab-based setting, where participants are manipulated and experimented upon cannot be seen as research in the wild, due to the interventionist, controlling nature of such practices that negate the in the wild setting. That is not to say that researchers should not play a role within the wild setting as can be seen in regard to the Context Resource Approach (Hayes 2011), Action Research-based (Ehn & Kyng 1987) approaches and in some settings where a degree of training or ethnographic study takes place (Johnson et al 2012).

#### PROOF-OF-CONCEPT

Many lab-based studies are largely oriented to proof of concept-based methodologies (Rennick-Egglestone et al 2009, Koleva 2009). This means that concepts are brought into being in order to establish (prove) that the concepts physically work. This is particularly evident when developing software and technologies. In such settings the technology doesn't need to be developed with an end user in mind, it could simply be that a concept is realised, in order to prove that it will initially work in its physical form. Indeed the proof of concept doesn't necessarily need to be tested by people if there is no intended user-group, it could be that the technology merely provides nothing more than a cool demo and the technology may be used later. The concept doesn't have to come from a technologist or scientist, but may come from an artist or anyone who has a concept that they would like to test out. So, experiences may be designed that use technology in different ways to support pervasive games (Chamberlain et al 2011, Chamberlain et al 2013), experiences on fairground rides (Rennick-Egglestone et al 2008) or persuasive computing systems (Chamberlain et al 2007), but these are designed and tested without input from the user group, unlike our research in the wild study where the system was designed with users having input throughout the process.

Such systems are often evaluated post design and development. The system acts as a demonstrator and provides results that other researchers may use, based

on the use of the technology and its impact upon the user. Evaluation is a requirement in any lab-based study (Lynch 1997), yet evaluation leads to results that more often than not can tell us if our study has been *successful* or inform us of some new findings, but how can results inform design?

#### USER EVALUATION

Often design is established through user evaluation, that is to say that the results obtained from carrying out user evaluation informs design, but does evaluation innovate. Experiments, run-throughs and a whole plethora of different methods (Kjeldso and Graham 2003) are used to evaluate the way that the users interact with the technology/system being researched.

These experiments are often conducted by either bringing the user into the laboratory or by placing the user in another controlled setting, as Kjeldso and Graham (2003) note, experiments can take place in, "various controlled environments such as in an office, ... in a hallway, ... or in a simulator." The results of the evaluation are then fed back to the design team, designer or developer. The results from these quantitative evaluations can then inform the next round of design and development, prove a hypothesis or may simply be used to inform other researchers of the findings from the research. Unlike research in the wild, which might wish to have as little intervention in the user's environment as possible (Rogers 2011); experimental approaches actively pursue an agenda that attempts to control and regulate the environment in which the evaluation takes place, and the participants taking part in that experimental procedure. These controls are put in place in order that the said experiment may be replicated by anyone who follows the procedure as reported by the researchers in other controlled situations, such as the laboratory that are not prone to natural everyday intrusions (Lynch 1997). Of course many of these experiments are not replicated. In a recent panel discussion (Wilson et al 2011) Thimbleby stated that only 30% of research in papers within the field of Computer Science is replicable.

Other quantitative studies are often short term, and do not fully engage with the user's longer-term behaviour, and their behaviour with others: even more specialized arts-based experiences don't look beyond the scope of the technological intervention (Rennick-Egglestone et al 2008, Chamberlain et al 2007) in order to understand the effect of the full effects of the intervention, pre and post taking part in the experience, but in an in the wild study, evaluation isn't at the core focus of the research. Firstly, it's important to understand if the technology is appropriate for the user group, or people will not engage with or adopt the said technology. Understanding the day-to-day routines of users, their community and personality is at the heart of engaging them in the design process and understanding how, with whom and where evaluation can occur. Unlike experimental studies where a researcher might only have contact with the

experimental participant for 30 minutes and the participant might not be an end-user, research in the wild needs longer-term engagement.

Rogers (2011) poses a fundamental question about research in the wild: “it involves observing and recording what people do and how this changes over suitable periods of time. Whereas the burning question in HCI used to be “how many participants do I need?” the hotly debated question now is “how long should my study run for?” These studies could theoretically run from months through to years.

#### IS USER EVALUATION CRITICAL TO CURRENT HCI APPROACHES?

Although one could argue that the user evaluation is critical to current HCI approaches, in this project the main research focus was never about the evaluation of the end-product. Indeed one could say that the model of end-product evaluation is an attempt to place HCI within a framework relating more to the physical sciences, which pays little to no interest upon the complex human-systems in which the technology will be used. This oversight often places an importance upon error-rates, time on task and a perceived subjective ease of use, instead of understanding the *real-world* use of the technology within its appropriate in-situ/local context. This is not to say that studies that appear in the lab may not be seen as ‘in the wild’ if this is to be their appropriate setting. The main focus was on the process of design in the wild, the sustained engagement of the user in their own context, and having them feedback enough for us to learn from these experiences and to enable organisations to take on our system in a sustainable way; that had been developed through the engagement of the community. In the next section we briefly discuss doing research in the wild.

#### DOING RESEARCH IN THE WILD: A NOTE

Innovation, not design was a primary concern of the project. It may help to have this idea further illuminated. Design was a secondary concern of the project; indeed, it was one of many that go into ‘the mix’ that can lead to innovation. Throughout the lifespan of the project it was important that we appreciated innovation as primary concern, that we created something new, which we innovated. Design is a property of innovation, but design is only one of many processes that can together explicate the story of innovation. In doing innovation design is often treated as a lynchpin, linking users and the end-product, however, one can end up with a standard model for carrying out design that can prove non-consonant with the ways in which the world of innovation works on a practical local level.

This can currently prove problematic for HCI if we are to take these existing design-based and evaluative practices as ‘normal science’ (Kuhn 1962) as they become increasingly inadequate for contemporary purposes, which are essentially about innovation in

novel contexts. In ignoring the essential ‘in the wild’ nature of innovation, existing practice becomes little more than ‘weak science’. As Greenberg & Buxton (2008) write, “using standard usability, evaluation methods to validate innovation outside of its culture of use is almost pointless”, so there is an evident need to develop alternate development methodologies. In this paper we have elaborated upon some of the approaches that we have adopted in doing research in the wild, however it would be a mistake to think that we are advocating action research or CRA as alternates to existing practice, each has their limitations, rather we are using the language of established research and development practices to articulate new methodological challenges that confront us when we try to do research in the wild.

#### PLACEBOOKS: FUTURE CHALLENGES

Leading on from our brief interlude on innovation it is important to examine the future possibilities for the future of the Placebooks system. In many respects a core part of future the development of IT systems is in the way that they are generalized as a system that can be used for a multitude of purposes. Using approaches that lean towards participatory methods can often be (wrongly) seen to be non-generalisable and bespoke in their nature. However the Placebooks platform lends itself to all kinds of developments and use in other innovatory ways. Currently we are in the process of examining its use in regard to the creation of food-trails, marketing for local business and its application as a tool that may be used articulate product provenance by local food producers and retailers (Chamberlain et al 2012). In itself Placebooks also lends itself to be used as a participatory platform by which researchers, practitioners and policy makers.

#### CONCLUSION

The conclusions from this project are two-fold, about the methodologies used and about the IT system that was developed as part of the research. The system that we developed was successful in regard to its adoption by a professional body, but we are yet to know the how successful the system will prove to be over time, particularly as technology changes and there is a need to support such technologies when change occurs, which can prove costly. In many respects these projects are about learning and gaining experiences that can be passed on to both researchers and practitioners that work with communities in rural settings. So, we would like to conclude by offering a brief summary of what we see as the salient points of our research.

Rural is not a generic type of setting that is easy or able to be generalised, not all rural settings are the same, and it’s important to realise this. It is the local setting, local understanding and in-situ context of the research that is important. Rural is generic gloss that doesn’t appreciate the complex nature of the local site.

Having researchers embedded in the community and in the research site for sustained periods of time is important because, it enables the researcher to understand the broader context of the research site and the social lie-of-the-land. It helps the researcher get seen and accepted by the community, and provides the research team as a whole with a conduit, what might be termed a trusted-intermediary by which they can appropriately access the site and stakeholders.

Both in regard to our design, design approaches and engagement we were lead by stakeholders, but it needed to be appreciated that this was in regard to a negotiation so that we were able to carry out our work and get our desired outputs. Prioritisation of design and the role it plays in innovation is a negotiated process between all of the actors involved.

In the process we found that it was best to adapt method and approaches, and not to stick too closely to the doctrine of any method. We chose whatever was appropriate to the context of the research, if something didn't work we adapted it, and sometimes this changed. Approaches, like people should not be seen as static artefacts. Indeed, as part of this we started to appreciate that design in itself is part of innovation and that approaches to design are adaptable.

In carrying out research in the wild, out of the lab space and working with emergent issues and real-world problems, one can fully appreciate that true innovation when we truly take account of the local setting.

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