

# Probing Communities: Study of a Village Photo Display

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## ABSTRACT

In this paper we describe a technology probe aiming to aid understanding of how digital displays can help support communities. Using a simple photo gallery application, deployed in a central social point in a small village and displaying user-generated photos and videos, we have been able to gain an understanding of this setting, field test our device and inspire new ideas directly from members of the community. We explore the process of deploying this display, the response from residents and how the display has taken a place within the community.

## Categories and Subject Descriptors

H.5.m [Miscellaneous].

## General Terms

Design, Human Factors.

## Keywords

Technology probe, situated display, community, interaction, content sharing, deployment, field study, digital photos.

## 1. INTRODUCTION

Our work aims to understand the ways in which the physical placement and design of networked displays in semi-wild environments influences and facilitates coordination and community, to inform the development of guidelines and methods for future displays. It is our hypothesis that such displays can help foster a sense of identity and history in communities and complement existing materials displayed publicly in communities which already aid the dissemination of news and information.

This notion of identity and history was explored by Mynatt *et al.* [11], who identified three critical features of a community:

- **Boundaries.** A community is defined by its boundaries (spatial, relational, technological, institutional, etc.), which may include various degrees of membership.

- **Relationships.** Communities are based on meaningful relationships within the group, which define expectations and acceptable practices.
- **Change.** Communities are dynamic and develop a sense of history as they change and evolve.

We have been able to see the impact of these features on digital displays ourselves with the assistance of residents in Wray (Figure 1), a village situated 16km from Lancaster in the North West of England covering a geographical area of approximately 2km<sup>2</sup>. It is a vibrant community with a mix of attractive historic stone cottages and some newer developments on the edge of the village where farms and other rural industries used to reside. There are around 120 houses with a total population of under 500 representing all age groups, but with a slight bias towards the older generation.



Figure 1. Wray Village, Lancashire.

In 2004, Lancaster University, in collaboration with the village community, created a project to deploy a resilient wireless network across the entire village—the village’s remote location meant that their only option for Internet access had been a dial-up service. Whilst the project was technology focused (centred around the delivery of the wireless network), at the same time it created an environment for future research projects, establishing strong links between University researchers and the village community that have continued well beyond the initial project itself.

As part of our study in the village, we have undertaken a technology probe approach [8], aiming to understand the needs of the community and inspire new designs, in addition to field testing our technology. This has been achieved with the deployment of a simple ‘technology seed’ [8] to gather in-situ usage information and generate interest and ideas from the community. In our study, the Wray Photo Display, a situated display which allows users to view images and videos uploaded using either Bluetooth or the web, served as the technology seed.

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In this paper, we will introduce our seed technology and see how user feedback from the probe has demonstrated the potential for displays to support communities and highlighted the important part which the critical community features, particularly the notion of history and change, play in the community's embracement of this technology.

## 2. INVESTIGATING THE COMMUNITY

Our investigation in Wray used a variety of techniques which had proved successful in previous projects [2], including trips to the village, extensive photography of social spaces and cultural probe packs to gain an understanding of the community and an insight into the ways in which situated displays could be utilised. A discussion of our analysis of the resulting probe data can be found in [4].

We began our investigation in early April 2006, when one of the authors undertook an observational study, involving visiting and photographing community spaces with a view to understanding the way messaging and information displays were utilised within the community. A further visit took place in May 2006 during the annual Wray Fair and Scarecrow Festival, an important event in the village and surrounding area, during which one of the authors took photos which would later be used in our first Photo Display deployment.



**Figure 2. Probe packs being distributed in Wray and a completed pack.**

Much of our work in Wray was enabled by the help of Chris Conder, a local technology enthusiast who championed our cause to members of the community, particularly through the Computer Club which she organises. We distributed ten probe packs during two meetings with the club at the end of April and beginning of May, containing cameras and notebooks for participants to record their views on village life.

From both our own observations and the contents of the probe packs, we noted several areas serving as key social spaces within the community. The village hall in particular is the main social focal point in the village and rooms in the building are used by a variety of groups for different purposes, including as a doctors' surgery and cinema. There are also unlocked notice boards outside the building (captured by a probe pack in Figure 2). The village post office is another important social space, with many notices and adverts displayed across several surfaces. In addition to noticeboards, we saw a large number of historical photographs displayed in the village hall (Figure 3) and in a local pub.

Towards the end of May, we met again with members of the Computer Club. Inspired by the large number of historical photographs already being displayed publicly in social spaces around the village, we suggested an adapted version of our Hermes Photo Display [3]—a situated touchscreen display which

rotates through images uploaded by users with Bluetooth mobile phones—as a seed technology.



**Figure 3. Historical photos displayed in the village hall.**

## 3. THE TECHNOLOGY PROBE

In fitting with the technology probe approach, this would be a 'good enough' deployment, with limited functionality and no rigorous usability testing beforehand. Our intention was that the display would be formative, with new features and design improvements spurred directly by user feedback and observation. As a result, a certain degree of expectation management proved to be an important factor in the design process; while residents hoped for a high level of functionality, the technology probe approach necessitates the deployment of a simple and flexible seed to allow it to adapt to the needs of its environment. We did, however, recognise the importance of reliability in the probe technology; we believed that residents would quickly lose interest in an unreliable deployment and see any future displays as equally unreliable.

Throughout the probe deployment, the display logged all user interaction for later analysis and users were encouraged to write in a comments book left by the display to express their opinions.

### 3.1 First Deployment

When first deployed in early August 2006, the Photo Display application was nearly identical to previous incarnations of the system. The only major addition was a web interface to satisfy a requirement elicited from discussions with the Computer Club, who wished to be able to view a current screenshot of the display on the web at all times.

The web interface was further expanded due to our own concerns that inappropriate content could be posted to the display, potentially having a negative effect on the acceptance of the display and relations between the University and Wray. We felt that moderation of the content by a member of the community itself would be the most appropriate way to avoid this and developed a small web application accessible by Chris and our team, which would allow administrators to approve or reject all photos before they were displayed. The application also allowed administrators to upload images using the website. Chris added her photos of the Scarecrow Festival shortly after the display was deployed, once networking issues were resolved.

The display was initially placed inside the village hall (Figure 4) on Chris's suggestion. It was believed that the volume of traffic generated by various activities would ensure exposure for the display and the building's mesh box provided excellent Internet connectivity.



Figure 4. Users interact with the display in the village hall.

### 3.2 Early Improvements

Within the first month of deployment several changes were made to the display, resulting in the version on which the majority of our analysis is based. The village Produce Show in mid-August 2006 allowed us to gather immediate feedback from members of the community and generated a large number of entries in an A4 writing pad placed next to the display as a comments book.

Most common amongst the early feedback was a request for an ‘Old Photos’ category; we quickly added categorisation to the display, with categories controlled by the administrators. An ‘Old Photos’ category was added soon afterwards by Chris and populated by around 200 historical images. Categories have subsequently proved to be a useful method for providing insights into the aspects of community life which are most important to residents.

We also spoke to an elderly resident who found small thumbnails on the screen difficult to see; this led to the decision that touching a thumbnail should display the image at full size in a dialog box.

Although we had originally intended that uploads to the display would be through Bluetooth, the majority seemed nonplussed by the technology (this impression would be confirmed by our logging results, as we will see) and displayed much greater interest in uploading to the display from the web. In light of this, a more robust web application was developed to provide all users with the ability to register with the system and upload images through their browser.

Users also requested the ability to control their own categories—specifically one user who wished to share his wildlife photography. This led to a concept of *delegated moderation*, in which users would become responsible for moderating categories which they create. While Chris was responsible for approving categories, the owner took responsibility for both maintenance and content of the category. Category owners were additionally allowed to disable uploads by users other than themselves.



Figure 5. The display after relocation to the village post office.

The use of a trusted administrator to approve categories ensures that only trusted individuals can become moderators. There has already been an instance in which a category was rejected, as Chris did not know the creator.

At the start of October 2006, once the display was well-established in the village and considered reliable, Chris moved the display to the village post office (Figure 5). Although the village hall was frequently visited, it was not always accessible to the public. Furthermore, the room’s future was uncertain, due to the pending installation of a PC suite.

As the only shop in the village, the post office installation ensured the display would be seen by a large number of residents and would remain accessible any time the post office was open, with the added security benefit of constant supervision by the post office staff. We were additionally able to locate the display next to a public notice board (visible on the left in Figure 5), increasing its association with community life.

## 4. TECHNOLOGY APPROACH

The display consists of three main elements: a Java application which is visible at all times on the touchscreen and controls Bluetooth interaction; a set of PHP webpages which allow administration of the display and image uploads; and a web server and database which store images and associated meta-data. A diagram of the full system architecture is shown in Figure 6.

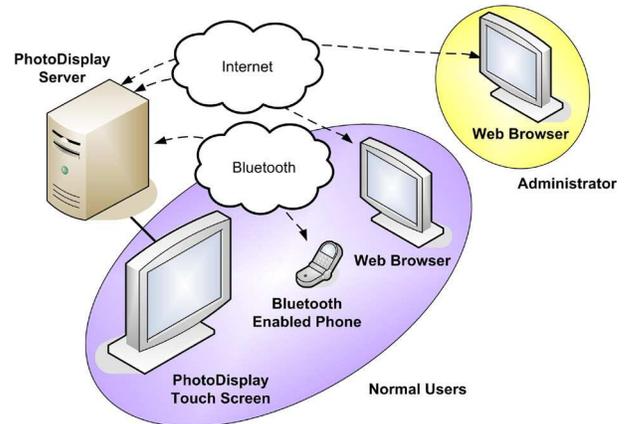


Figure 6. Architecture of the Photo Display system.

The display runs entirely on an Apple Mac Mini under Windows XP. These machines were chosen for their small form factor and near-silent operation; this allows them to be situated almost anywhere without creating an intrusive presence.

We believed that the lack of a visible computer would also help the display to be seen as a natural presence, like a noticeboard, rather than a computer. Although the 19” touchscreen display used with the deployment is quite clearly a PC monitor when stood on its base, rendering the illusion somewhat less than complete, there has been no feedback relating to this. There has been some discussion about wall-mounting the display, though we have encountered resistance to any permanent fixtures in previous projects, for fear of leaving visible damage which outlives the deployment.

### 4.1 Gallery Application

The main section of the system is the Java application displayed on the touch screen. As with its predecessor system, this displays

galleries of thumbnail images (Figure 7), which the user is able to browse back and forwards through. If the screen is left unattended, it will scroll through galleries at 20 second intervals.

In addition, users can skip directly to a certain category of images. When selecting a category, normal image thumbnails are replaced with thumbnails of the first image in each category. Touching a category displays its description in the centre of the screen, with a button to open the category.

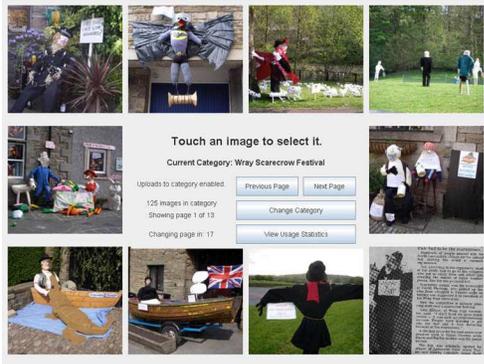


Figure 7. The main gallery screen displaying images from the Scarecrow Festival 2006.

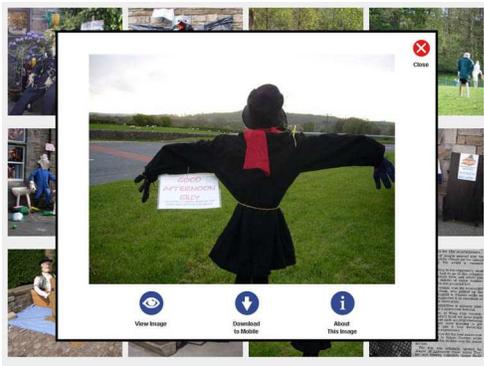


Figure 8. Large image and controls launched when a thumbnail is touched.

When a thumbnail in the gallery is touched, a large dialog is displayed containing the full-sized image (Figure 8) and options to view comments and statistics, or download the image to a mobile phone using Bluetooth. If the user opts to download to a mobile, the display will scan the area for discoverable devices and the user can select their device from a list to initiate a transfer. Images can also be uploaded directly to the display using a normal Bluetooth OBEX file transfer.

## 4.2 Web Application

The PHP web application allows users to register and log in to the system, providing them with the ability to upload photographs and videos. Batch uploads, a requirement voiced by Chris after uploading the first group of images one at a time, are possible by uploading a ZIP file of images.

Users are also able to request categories through the website, moderate images that have been uploaded to their categories and edit category settings such as title and description. Category owners also have the choice to allow public uploads or not, or to

temporarily disable a category entirely. They may also edit comments or delete individual images if necessary.

Users designated as administrators are able to approve new categories and are additionally granted owner privileges on all categories, with the exception of moderation.

## 4.3 Database and Web Server

The web application runs on an Apache web server, with a MySQL database storing meta-data for images and category information used by both applications. Due to the experimental nature of the network in Wray the display was required to run in disconnected mode to remain reliable. Consequently, the display machine itself acts as the server so network problems only impede web access and not the functionality of the situated display (see Figure 6).

## 5. FEEDBACK FROM THE PROBE

Feedback on the display from members of the community is the primary source of data from our probe. This was gathered firstly using a comments book kept with the display, which generated approximately fifty individual comments from residents between August 2006 and May 2007. Secondly, we were able to take advantage of the increased village activity during the annual Wray Fair in May 2007 by temporarily deploying a second display, allowing researchers to observe the way users interacted with the display and interview them in a semi-wild environment.

Residents who we have not had the opportunity to meet have still been able to contribute feedback, often emailing their comments through Chris Conder.

We also gathered usage data through automatic logging of all interaction with the display into a database. This has captured 19,000 records of interaction events such as selecting an image, changing the category or using Bluetooth, affording us a method of gauging user interest, both during the deployment and in later analysis.

## 5.1 Log Data

To measure the amount of display interaction, we considered view events (a user touches a thumbnail to view the larger image), navigation events (a user has pressed the back or forward button) and Bluetooth events (uploads and downloads). Although we would have liked the application to identify individual users and log when a new session begins and ends, this would have added complexity to the display interface.

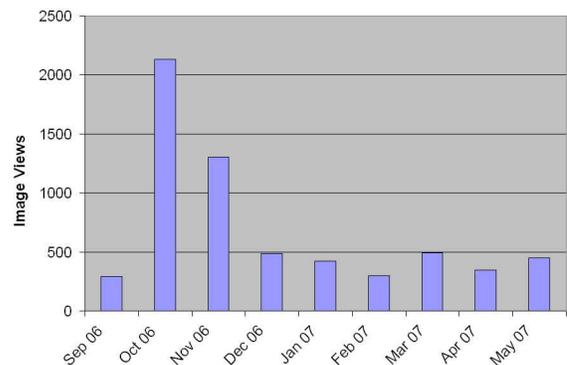


Figure 9. Number of image views per month.

Figure 9 shows the number of view events per month between September 2006 and May 2007. The large leap in image views in October followed the display's relocation from the village hall to the post office. After this, usage showed a decline to a steady level of between 300 and 500 image views a month. View events averaged 25 per day over the entire period.

It should be noted that the figure for May covers only the first nine days of the month. Due to the Scarecrow Festival, usage was unusually high. Most results from August were accidentally deleted and are therefore not included in our figures, although usage levels were similar to the monthly average.

Much to our surprise, we found events which *hadn't* occurred to be more interesting than those which had. Our logs showed very few navigation events—only 153 in total. Around 100 of these took place on the first day of logging and can be attributed to testing and the remainder fall into nine discrete periods of activity, each only a few minutes in duration. So, despite relatively high usage overall, very few users are browsing the display.

Furthermore, logs showed a near complete lack of Bluetooth interaction. Across all nine months of logging, there were only four successful downloads, 33 failures, five cancelled downloads and no uploads. This is not altogether surprising; although many phones are Bluetooth equipped, actual usage is perhaps not as widespread in the UK as it is in other countries such as Africa [10]. As we saw previously, residents involved with the project preferred the web interface, so little emphasis was given to Bluetooth interaction in the final user interface or in the promotion of the display to community members.

## 5.2 Comments Book

Feedback obtained via the comments book has been overwhelmingly positive, with users particularly praising the potential utility of the display. The appeal seemed to be universal; some users opted to leave their name and age, showing an age range from just three years, through to 96.

The fifty entries in the book were replete with ideas for possible extensions and novel uses for the display, which we shall summarise in this section.

### 5.2.1 Historical Photos

As mentioned previously, one of the earliest and by far most numerous requests was for historical photos of the village to be posted on the display (“it would also be good to see some of the older photos of days gone by”, “please could we see some old photos of how the village used to look?”, “would be great to see some of the historical pictures of the village”).

This, in part, led to the development of separate categories for the display, allowing historical photos to be grouped together. The new category was quickly populated with pictures of village buildings and school photographs of various ages, as well as specific historic events, such as the installation of electricity lines in the village and damage done by a serious flood.

An additional comment received by email summed up the general opinion of residents: “The digital notice board has many advantages for the village... there are quite a few new people in the village and this gives them an insight as to what Wray used to look like, although visually it has not changed very much. The flood photos are one way the old and newer village can be seen. Also the photos of the previous villagers i.e. school photos,

weddings, industries carried out in Wray (which many newcomers will probably not be aware of) and just local characters are invaluable in the history of Wray.”

In this we see the importance of not only the sense of history and change, one of the three identified features of communities, but also the boundaries and relationships which define membership and entrance into a community.

One comment invoked the notion of change particularly well: “A great way of recording a living history of Wray”.

### 5.2.2 Village Life

Many users expressed satisfaction with the ability to view photographs of recent village events. This included not only those who had participated in the events (“good to see the scarecrows again”), but also those who were absent (“I missed the last couple of days of the Scarecrow Festival and this gives me the opportunity to see some of the activities and scarecrows I missed”).

Users also thought that this would be an excellent way for visitors and new members of the community to gain an insight into village life (“what a superb idea, especially for those who are new to the village”). This strongly links to the notion of community boundaries and membership and the process of “apprenticeship” and “learning the ropes” which we had previously encountered evaluating the display with the University's Climbing Club [15].

### 5.2.3 Communications and Advertising

Another recurring suggestion was the use of the display as a digital noticeboard to announce community events and news. Many comments already referred to the display as a noticeboard, even though it was not designed with this functionality in mind.

Regardless, it was seen as an innovative way of disseminating important social information to the community (“good way to find out what is going on in the village, dates and times etc.”, “it will aid communications at all levels, from bus timetables to social events”, “what an excellent way of keeping everyone informed of what's on”). Two separate comments suggested an online version of the village newsletter (“can it be extended into an onscreen version of Wrayly Mail or village notice board”, “endless possibilities... online Wrayly Mail”).

Several comments also suggested commercial advertising in addition to community announcements (“what about selling advertising space to villagers”, “I would like the noticeboard to showcase local businesses”), along with the suggestions of community uses for revenue generated (“proceeds to a village charity”).

### 5.2.4 Location Suggestions

Two local businesses, a tea room and an online services business, indicated an interest in having their own displays (“I would be interested in having one at the tea rooms”, “digital noticeboard looks great, can we have one?”). The tea room was another location which we had identified as an important social space, which could be especially suited for a display deployment.

### 5.2.5 Audio Content

Several users requested audio content in addition to videos, both for accessibility purposes (“could you consider an audio version for the visually impaired?”) and for general interest and entertainment (“I think it would be great to have podcasts on the

notice board”). This was again linked to historical content; one user cited a story told by an elderly resident about the first time chips were sold in the village by her father as a possible example.

Although this is not technically challenging, the situated nature of the displays does present problems. Depending on the particular location of the display, audio content could become an annoyance. In the current post office deployment, the interests of the staff need to be taken into account.

### 5.2.6 Content Sharing

One user expressed an interest in using the display to share content with other members of the community (“I’d like to share my pictures with the village and see if any of the villagers have any wildlife photos”).

This was another factor in the decision to add categories to the display and led to the idea of category ‘ownership’ and delegated moderation, in which a normal user, rather than a member of our team, would moderate submissions and accept responsibility for the content of categories.

### 5.2.7 Games

A number of comments from younger users requested that games be added to the display (“I would like the computer to have games and videos on it as well”, “I would like to see games”). It may be worth considering whether a ‘fun’ element could be incorporated into the display, such as puzzles based on submitted images.

## 5.3 Wray Fair Deployment

In May 2007, we were able to present our display at the annual Wray Fair. This gave us an opportunity to speak to users who had been using the display on a regular basis—including those who had uploaded large numbers of photos and moderated categories—as well as visitors to the village using the display for the first time.

### 5.3.1 User Feedback

Again, we found that the historical photos of the village generated the most interest, particularly in those who remembered the events portrayed. Especially popular were images of the Wray flood of 1967; we spoke to one resident who was evacuated from the village as a child and another who recognised damaged buildings he had helped to tear down. Users also enjoyed identifying now-adult residents on school photographs. However, when they were unable to recall details themselves, users were frustrated with the lack of meta-data available under the ‘comments’ section of the display. Currently, this only displays comments added during upload (frequently none), while users would prefer to be able to add their own comments and memories.

Discussions with several users resonated with written comments and the critical features of communities identified previously. Many felt that the display would be good for new residents and that it recorded a “living history” of the village. They also noted that the display offered greater capacity and safety than a physical photo album.

A great deal of interest was expressed in having a fully browsable gallery on the website, rather than just administrative functions. This request was made by both local residents and visitors who would like to view photos from outside Wray.

We also spoke to users who felt that the post office was not an ideal location for the display and others who had seen it but not

interacted with it. They described their normal trips to the post office as “in and out” transactions, during which they would not take the time to pay attention to the display or interact with it. One user suggested the village hall, where the display had previously been located with less success, as a more suitable location.

### 5.3.2 Observation of Interaction

The fair also gave us an opportunity to observe a large and varied group of users interacting with the user interface. This proved especially useful in spotting unintuitive features and bad interaction designs.

The most common problem we saw occurred on the category selection screen (Figure 10), where users expected touching a thumbnail to open the category, when they are actually required to touch a ‘View Category’ button. This was not an unreasonable expectation on their part, given that an equivalent action on the main screen opens an image for viewing.

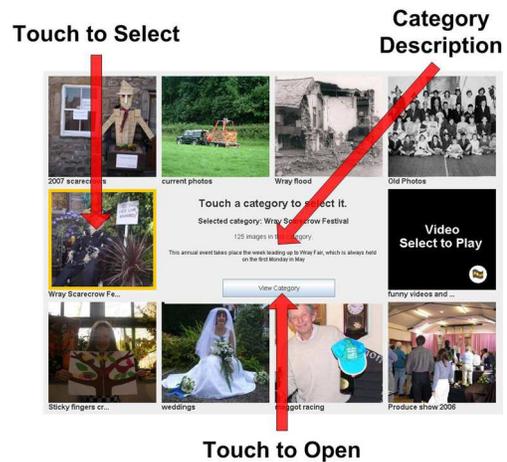


Figure 10. Category selection screen showing interaction points.

Our original motivation for this design was to allow a category description to be displayed in the centre of the screen, but users did not appear interested in this information, seemingly finding titles under the thumbnails informative enough to make a selection. Even after touching the thumbnail was unsuccessful, users would touch it repeatedly rather than read the central area.

We also saw that users would spend time looking at each picture in turn, which involves the repetitive process of touching each one and closing each dialog manually. The ability to browse through images within the image viewing dialog might save time if users are interested in viewing many pictures within the same category.

## 6. DISCUSSION AND FUTURE WORK

As seen in the previous section, we were able to identify a number of patterns in the data collected from our probe, which suggest directions in which we can proceed with the design of future versions of the Photo Display and other displays which may be deployed in the community.

While the current display has proved popular, our study has highlighted a number of ways in which the display could fulfil a larger role in the community, ways in which its use has defied our expectations and problems with the design. As we saw in the previous section, users have been particularly forthcoming with

functionality suggestions. We plan to refine the feedback received so far with direct help from the community; we are currently planning a questionnaire and design session, with which we to gauge the community's opinion of possible changes.

This section will detail a number of particular issues we identified which we believe to be most significant and hope to address with future studies in Wray.

## 6.1 Comments and Metadata

Metadata is an area which we feel could be vastly improved in the display. The images contained on the display form part of a rich shared heritage and users clearly attach a vast amount of meaning to them which the display is not currently capable of supporting.

Taking inspiration from online communities, we hope to investigate various interaction techniques, both situated and web-based, for commenting on photographs. 'Tagging' photographs with keywords is one technique which we believe could be especially useful for categorising images.

## 6.2 User Interaction

Though usage of the device was high, interaction has not always been in the ways we expected. While observing user interaction, we saw that users rarely paid attention to information displayed in the central panel of the screen. The navigation buttons, which saw limited usage, are also located in this area. We plan to reconsider the placement, and indeed necessity, of some of the information and controls currently displayed in the central panel. This is a problem which can best be addressed using our design session.

We have also seen that the web interface is a mode of access through which users are ready to contribute to situated display content. This could be greatly expanded to provide more features and better management of images.

## 6.3 Perception of the Display

Feedback and suggestions from community members, as well as the terminology used to refer to the display, shows that it is seen as potentially more than just an image gallery. Frequently, users referred to the display as a "notice board", suggesting that they may see the display as able to offer a greater service to the community. Requests for advertising space for both local businesses and village events echoed this.

We've also seen, repeatedly, that members of the community believed the display could be used to record a "living history" of the village and help to integrate new residents into the community. We believe that future developments should cater to these desires to the greatest extent possible, in order to maximise the display's utility in the community.

## 6.4 Technical Issues

Broadly speaking, as a field test of our technology the Photo Display deployment was successful; there are only two areas in which we felt our implementation underperformed technically.

As with previous iterations of the display [3], we continued to find Bluetooth to be a problematic technology. While the potential for interaction between mobile devices and situated displays using Bluetooth is undeniable, we have consistently found the discovery process to be too slow and unreliable to offer a satisfactory user experience. This could be a factor contributing to the very low utilisation of Bluetooth features, as indicated by

the comparatively high number of failed and cancelled downloads.

Our first attempt at adding video support to the display also caused frustration, due to the Java Media Framework's lack of support for codecs commonly used by mobile devices. This prevented content filmed on mobile phones being uploaded to the display. We intend to reassess our approach to video support and investigate transcoding as a means of increasing format support.

## 7. RELATED WORK

There is a large body of existing work in the field of situated displays, including work relating to their place within social interactions and communities, such as social coordination using displays [12] and enticing users to interact with displays [1], which provide an understanding of human interaction with displays that is relevant to any deployment.

There have been many successful situated display developments worthy of note. Dynamo [9] was developed as a "communal multi-user interactive service", with a large desktop-like environment shared by many simultaneous users, to which they could post and share multimedia content. The Notification Collage [7] likewise allowed several users to share multimedia simultaneously, with the added benefit of enabling multiple, distributed displays. WebWall [6] made use of public displays to allow users to access Web content pervasively.

Other photo-based situated display systems exist. Romero *et al.* [13] developed a system allowing users to capture images on mobile devices and view them on a situated display, although this was intended for private use within a home rather than public use in a community. Digital photo frames, essentially situated photo displays for the home, are now commercially available.

Churchill *et al.* [5] offered an example of a situated display coupled with an online community. Their CHIplace and CSCWplace systems were deployed at conferences, using large, interactive displays that presented information from an online community. This blurring of the separation between content accessed from a home PC and content available at a public location reflects an approach we began to adopt by adding a web portal to our Photo Display.

Outside the field of situated displays, much work exists on the use of technology to support communities, including research into the notion of community memory [14], in which the community determines the content of a data repository, existing "simply to facilitate people's direct contact and contract with each other".

Our work also bears resemblance to web-based content sharing communities such as Flickr and YouTube. Like the Photo Display, these sites allow users to share photographs and videos, although typically the community grows around the content while the reverse is true of our system. While there are clearly different requirements for online and village communities, their approaches may be adaptable for a situated environment.

## 8. CONCLUDING REMARKS

We have presented the Wray Photo Display, a situated photo display currently deployed in a small village community as a technology probe, aiming to investigate how public displays can complement existing non-digital displays to deliver information and help foster a sense of identity and history.

Our analysis of feedback from automatic usage logging, written comments and direct interaction with users has demonstrated to us the following key findings:

- The display has proved to be a provocative and highly successful tool for inspiring new development ideas from members of the community and enabling co-design of future deployments with community members.
- The use of categories in the display provided useful insights into the areas of community life and village events which are most important to residents.
- A photo display, situated in an appropriate social place in the village, has proved to be a promising technology for fostering notions of community within the village and for communicating important aspects of the village community (e.g. parts of its history) to visitors.
- Our novel approach of enabling villagers to take responsibility and ownership of their own categories has, to date, appeared successful in enabling user generated content and encouraging participation by distributing control.

Based on the encouraging feedback from this probe, our current aim is to continue developing the Photo Display in Wray with the goal of understanding the community's needs and better fulfilling their requirements. Using our existing feedback to inform the design process, and by continuing to involve the community through questionnaires, participatory design workshops and continued observation of our seed technology, we believe that future displays can gain even greater acceptance and fill a larger role within the community.

## 9. ACKNOWLEDGMENTS

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