

## Supporting Awareness and "Sense of Community" through Situated Displays



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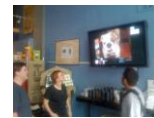
## Structure...

- Background/Motivation
- Three Settings
  - Lancaster University
    - Hermes Office Door Displays
    - Hermes photo display
  - SPAM
  - Rural Village (North of England)
    - Wray Photo Display
- Questions

## Background/Motivation

- Basic research area
  - HCI, CSCW (Computer Supported Cooperative Work) and Groupware Systems
    - "how collaborative activities and their coordination can be supported by means of computer systems." (Grudin, 1988)
  - Note 'Work' in its widest sense
    - Coordinating activities through shared awareness in an office environment...
    - Maintaining 'sense of community' in a rural village...
- Technology Focus
  - Situated display technologies (can be quite mundane!)
- Design Approach
  - Iterative, UCD/PD (User Centered Design including Participatory Design)
    - "Start with the users, and to work from there" (Norman, 1988)
  - Use of Cultural and Technology Probes
    - Inspire design ideas, Engage with the user
- Evaluation Approach
  - Longitudinal study of deployed systems (cf Lab studies)
    - Deployment based research...
    - Insights into adoption and appropriation

## Examples of Situated Displays



## Situatedness...

O'Hara, (2002): "In recent years, more and more information is being presented on dedicated digital displays situated at particular locations within our environment. At their most basic, digital display technologies allow information to be more easily updated dynamically and remotely. However, these new kinds of interaction technologies also allow people to use these situated displays in novel ways both as for the individual's purposes and in the support of group work."

Harrison and Dourish (1996) on Place: "a space which is invested with understandings of behavioural appropriateness, cultural expectations, and so forth".

Encompasses not only the physical aspects of the environment and the constraints these impose on behaviour, but also what actions and patterns of behavior are expected there and the particular routines that have developed there over time.

## Awareness and Community...

- Portholes (Dourish, 1992)
  - Shared media space



Awareness involves knowing who is "around", what activities are occurring, who is talking with whom; it provides a view of one another in the daily work environments

...the sense of whether people were around and seeing my friends; knowing who's around; feeling some connection to folks at [the remote site] (sharing a "community" with them)

Dourish, P. and Bly, S. 1992. Portholes: supporting awareness in a distributed work group. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (Monterey, California, United States, May 1992). CHI '92. ACM, New York, NY, 541-547

## Sense of Community...

- McMillan & Chavis (1986) define Sense of Community as
  - “a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members’ needs will be met through their commitment to be together.”
  - 4 elements according to the McMillan & Chavis theory:
    - Membership
    - Influence
    - Integration and fulfillment of needs
    - Shared emotional connection
      - The “definitive element for true community”
      - Includes shared history (or at least identification with the history).
- Mynatt et al. (1998) identify three simple ‘defining features’ of community, essential to design.
  - Boundaries
  - Relationships
  - Change

## Hermes...

Supporting Coordination/Awareness in a University Computing Department

Nichols, (2002): “Office doors are more than entrances to rooms, they are entrances to a person’s time and attention. People can mediate access to themselves by choosing whether to leave their door open or closed when they are in their office. Doors also serve as a medium for communication, where people can **broadcast** individual messages to passersby, or accept messages from others who stopped by when the door was closed.”

Staff often away on conference trips, lecturing, do not keep regular office hours, etc.

Cheverst, K., Fitton, D., Dix, A. and Rouncefield, M. Exploring Situated Interaction with Ubiquitous Office Door Displays, in Proc. of CSCW Workshop on Public, Community, and Situated Displays, K. O’Hara, E. Churchill, M. Perry and D. Russell (Eds), New Orleans, November 2002

## Original Hermes System - Overview...

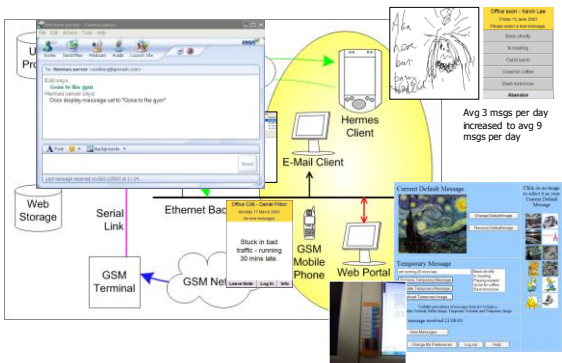
- Original Goals
  - Provide support for coordination/awareness
  - Explore the patterns of interaction that occur in semi-public/private place
    - Adoption/Appropriation
    - Longitudinal Study
    - Deploy reasonable number of units
  - Explore Properties of digital
    - Perception...
    - Remote Use...
    - Visibility...



## Approach...

- Phased/Iterative development
  - Initially deployed with ‘friendly’ users, wider deployment as reliability increased
  - > 10 units...
  - Additional functionality/changes to existing functionality occurred through consultation with users
- Methodology
  - UCD, Technology Probe...
- Evaluation/Exploration of use
  - Qualitative
    - questionnaires (open format), semi-structured interviews, etc.
  - Quantitative
    - questionnaires (likert based), analysis of usage logs
- Longitudinal study...
  - 27 months...
  - 1st unit deployed April 2002, Dismantled July 2004
  - Total number of messages set by owners: Approx 5500
  - Total number of messages set by visitors: Approx 750

## Interaction...



## Patterns of Use...

- Maintaining a Sense of Presence /Reason for absence (>90%):
  - “I would update Hermes to say I’m working from home – it’s part of my working routine”.
  - “...it’s just a habit that you get into, a habit of leaving a message.”
- Switching communication channels
- Playfulness, expressions of mood
- Accuracy & Deliberate Imprecision
  - “Back in 10 minutes”
    - What about automatic countdown feature?
- Privacy/Disclosure

“On bus - in shortly”

“Working at home today – reviewing papers”



Cheverst, K., Dix, A., Graham, C., Fitton, C. & Rouncefield, M. (2007). Exploring Awareness Related Messaging through Two Situated Display based Systems. *Human-Computer Interaction* 22(1-2), 173-220.

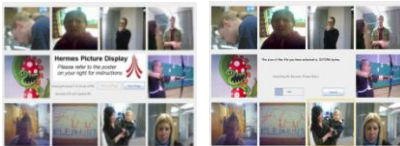
## Hermes Photo Display...



## Hermes2 Photo Display...



## Hermes2 Photo Display...



Cheverst, K. Dk, A. Fitton, D. Kray, C., Rouncefield, M., Sas, C., Sasaki-Lagoudakis, G. and Sheridan, G. Exploring Bluetooth based Mobile Phone Interaction with the Hermes Photo Display, in Proc. of MobileHCI 2005, Salzburg, Austria, pp. 47-54, Sept 2005

## Lancaster University Climbing Club

- Q: "A display associated with my university society would be a good idea ..."
- No negative responses...
- "I'm a member of the climbing club. Would definitely put pics of me climbing stuff on it"....
- Cultural Probes given to members of the club followed by design workshop
- Where to place display?



## Case Study 2:

Situated displays to support staff  
across geographically remote offices

...

## The Setting...

- A residential hostel + supported bedsits for former psychiatric patients
  - Encouraging everyday living skills
  - Inappropriateness of current methods
    - Interviews (police...)
    - Questionnaires (claiming social security...)
    - Need to establish trust
- Typically ethnographic methods have been deployed in commercial and industrial settings
- Methods for identifying user needs in sensitive settings are not well developed
- Obdurate problems that make direct observation intrusive, disruptive and inappropriate



## Research Questions

- What are the 'everyday rhythms', what are the problems, can technology help?
- What technologies do they already use that we could leverage, how were these used, were they used to support coordination?
- Specific issues to do with the availability and use of existing technologies and their affordances
  - E.g. use of mobile phones

## Cultural Probes: from Inspiration to Information

- Direct observation requires supplementation
- Cultural Probes - Gaver, Dunne & Pacenti- Presence project - 'inspirational' use
  - *"They may seem whimsical, but it would be a mistake to dismiss them on that ground: for unless we start to respect the full range of values that make us human, the technologies we build are likely to be dull and uninteresting at best, and de-humanising at worst."* Gaver 2001.
- Adapting Cultural Probes to open up communication channels and foster an ongoing dialogue with the members of our user groups
- Generate key insights into their unique needs.
  - ... offer fragmentary glimpses into the rich texture of people's home lives. They allow us to build semi-factual narratives, from which design proposals emerge like props for a film

Gaver, W.H., Dunne, A. and Pacenti, E. (1999a)  
"Cultural probes", *Interactions*, vol. 6 (1), pp. 21-29.

## Cultural Probe Pack

- A disposable camera, photo album, visitors book, scrapbook, post-it notes, pens, pencils and crayons, a set of postcards addressed to the researcher, and a map.
- Not explicitly 'designed' - present - modified over time
- Instructions:  
*These items are Cultural Probes - but don't worry - they're just a way for us to find out more about you, your everyday life, what you think and feel. We'd like you to use them to tell us about yourself - and below are a few ideas you might want to think about. Ignore these if you like - nothing is compulsory - do as much or as little as you like. We hope its fun. I'll come back to collect them in about a week*



## Abiding Concerns and Rhythms

- Major preoccupations –
  - medication;
  - safety and security;
  - **communication and coordination of activities**
  - **Sense of community between residents and between residents and staff.**
- Rhythms readily perceived - visiting rounds, movement of residents into, around and out of the site at various times of day, medication delivery, staff meetings..
- Communication resources overloaded in mornings...





## Adoption and Appropriation

- The SPAM unit acted as a *Technology Probe* (Hutchinson, 2003) enabling us to learn further about the setting and the way in which such a technology intervention might be adopted and appropriated in such a setting over time...

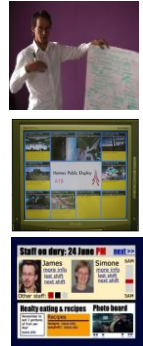
"how do u turn a duck in2 a soul singer - put it in the microwave until its bill withers"

- Longitudinal studies are typically required in order to learn about such issues...

Hutchinson, H., Mackay, W., Westerlund, B., Bederson, B. B., Drim, A., Plaisant, C., Beaudouin-Lafon, M., Convery, S., Evans, H., Hansen, H., Roussel, N. and Eiderück, B. Technology probes: inspiring design for and with families. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI 03)*, (Ft. Lauderdale, Florida, Apr. 05-10, 2003). ACM Press, 2003, 17-24.

## Design of a Communal Display for the Residential Facility

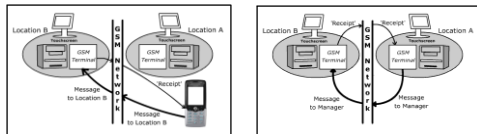
- Considered design of a display to be placed in the communal area of the 24hr residential facility...
  - Informed by...
    - observing notice board at residential facility
      - Much DTP produced material, e.g. Staff Rotas
  - Discussions with staff
    - Some staff felt that they would like residents to 'know' them more - but noted that there had been examples of damage to personal photos/pictures that had been brought in.
    - Encouraging residents to go on trips, e.g. Day trips to Blackpool.
      - Idea that residents/staff would take pictures and send to display
  - Design Workshop
    - 2004, talked through scenarios, showed photo display etc.



## Architecture...



- Data stored locally
- Travel to collect logs
- Alternatives
- Implications ??...



## Recall Broad Categories of use...

- Use as Confirmation**
  - Has Fax, email got through?
  - Has x left yet?
- General coordination between sites...**
  - e.g. Ordering food!
- Use to signify delays/need for help,**
  - Related to phone use, usually requests for phone to become free.
  - "please ring car wont start so cannot take ph and sm to cc barbara".
- Coordination with mobile users**
  - e.g. "Pizza & and chips are ready come on in :-)"
- Remote requests**
  - e.g. request to test the fire alarm
- Some jokes and general chit-chat etc.**

## Issues ??

- HERMES and SPAM deal ostensibly with Messages – But typically content sent to a situated display will share many of the same issues.

Who can send messages to the display and should access to mechanisms for sending messages be shared?

- In Hermes, ostensibly the owner but the 'leave message at door' facility did effectively provide shared access.
  - Inspired some interesting use cases/appropriation.
- Implications for system – is the identity of the sender obvious from the situation?
- In SPAM, access for sending messages was designed to be shared - any member of staff located in the staff room (or via mobile phone) could send.
  - Consequently, some messages were signed.
  - But, control mechanisms were introduced, e.g. blocking feature.

How public/private is the place where the messages will be displayed and who are the potential receivers of this information (1)?

- This leads on to questions of how salient messages should appear in the public setting.
  - With Hermes the overall design of the screen was such that it would not be overly salient to passers by who were not visiting a particular office.
  - With SPAM the font size used was specially chosen so that a resident entering a staff room unannounced would not be able to read a message on the screen.

How public/private is the place where the messages will be displayed and who are the potential receivers of this information (2)?

- Also raises issues of control:
  - whether a received message should be displayed automatically (as in Hermes) or
  - whether some action (e.g. a mouse click) should be required before the message is displayed (as in SPAM).
- In SPAM, the required mouse click on the 'READ' button acted as a confirmation to the message sender
  - implications of providing such a confirmation feature depend strongly on the potential audience, the level of disruption that can be tolerated and the dependability requirements of the particular workplace/setting.

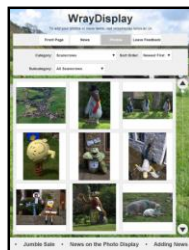
For the creation of messages, what level of expressivity should be supported?

- In Hermes owner had a reasonable choice
  - from highly expressive scribbled messages to prescribed (and very quick to select) short messages,
  - e.g. "Gone for Coffee".
- In SPAM messages were textual
  - but some members of staff did ask for a range of graphical emoticons to be supported.
- The effort required by the user is also related to this issue of expressivity.
- The level of expressivity supported also relates to the extent to which users can direct a message to a particular individual or group and the extent to which they can control the accuracy of the information.
  - crucial if notions of plausible deniability are to be supported.

Other Issues??

- What would be issues if a version of Hermes/SPAM was tailored for use in the home as a supplement to SMS/Phone/IM etc. ??

## The Wray Photo Display: Supporting Sense of Community in a Rural Village...



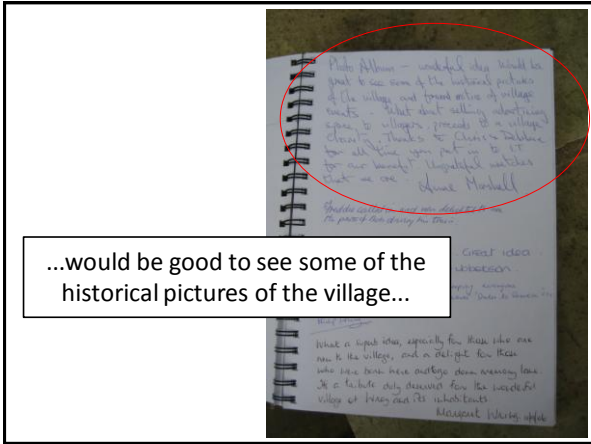
## The Wray Photo Display...



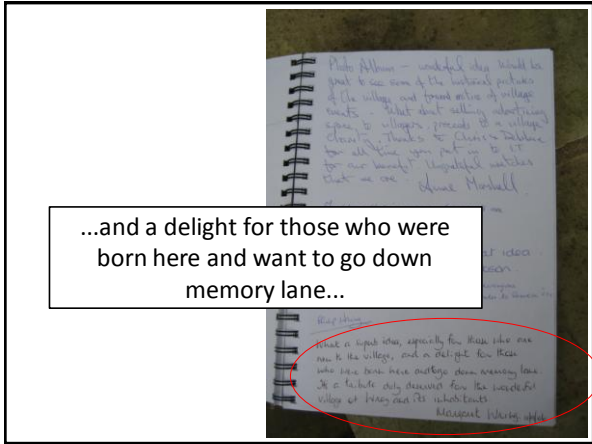
Taylor, N. and Cheverst, K. **Social Interaction around a Rural Community Photo Display**, *International Journal of Human-Computer Studies* special issue on *Collocated Social Practices Surrounding Photos*, 67, pp. 1037–1047, 2009



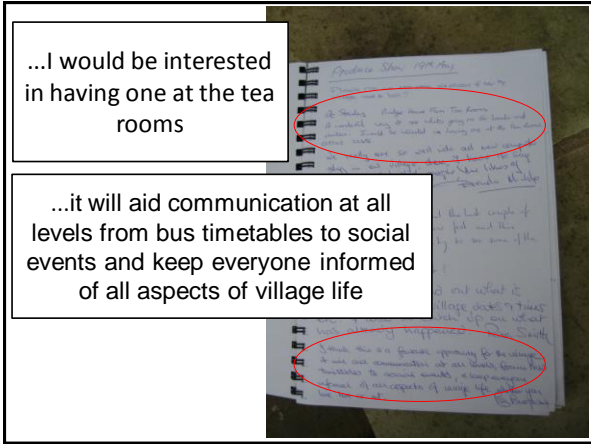




...would be good to see some of the historical pictures of the village...

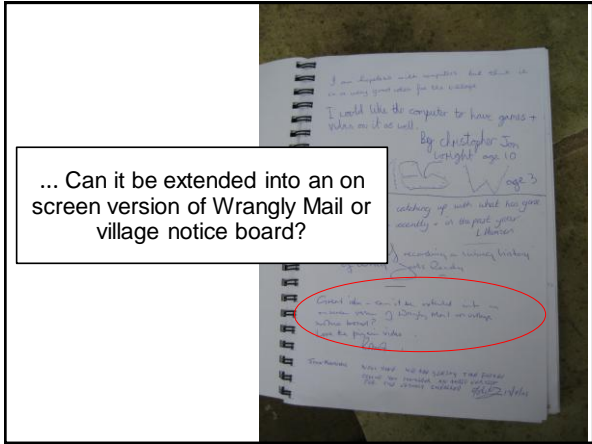


...and a delight for those who were born here and want to go down memory lane...



...I would be interested in having one at the tea rooms

...it will aid communication at all levels from bus timetables to social events and keep everyone informed of all aspects of village life



... Can it be extended into an on screen version of Wrangly Mail or village notice board?

### Supporting New Categories...

- Supporting User (Community) Generated Content...
- Moderation/ownership of categories

**Hermes Photo Display**

Home | [Upload Images](#) | [Your Categories](#) | [Moderation](#) | [Logout](#)

**Your Categories**

Installing the photo display [\[Edit\]](#) [\[Delete\]](#) Awaiting approval

**Request a Category**

Title:

Comments:

Public Uploads:  Allowed

By submitting a category request, you agree to be responsible for approving or rejecting any images uploaded to the category and ensuring that no inappropriate content is approved.



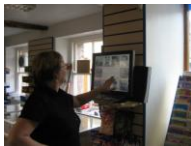
## “Wray Flood”...



## “Funny Videos and Photos”...



## A move to a new location...



- Early Oct 2006 Photo Display moved to Post Office.
- Shop owner and assistant described how popular the system had been with both locals and visitors
  - Reported that one visitor had spent 20 mins exploring photos.
- Discussed new categories
  - Owner wanted to add '60/70s' category...

## “Wray Photos not quite so old”...



...photos found of relatives we never thought we'd see.

Being able to look at the old Wray photo's has been fantastic in my family history research. photo's found of relatives we never thought we'd see. C. Utterback

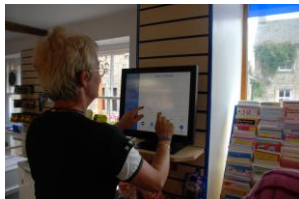
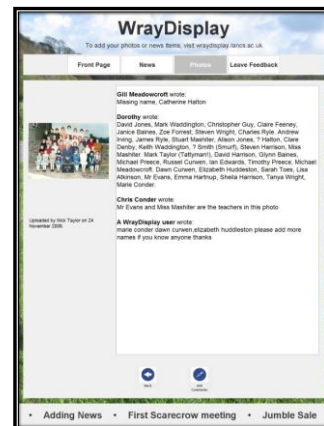


Photo Display User - 3rd November, 2007 at 12:28pm

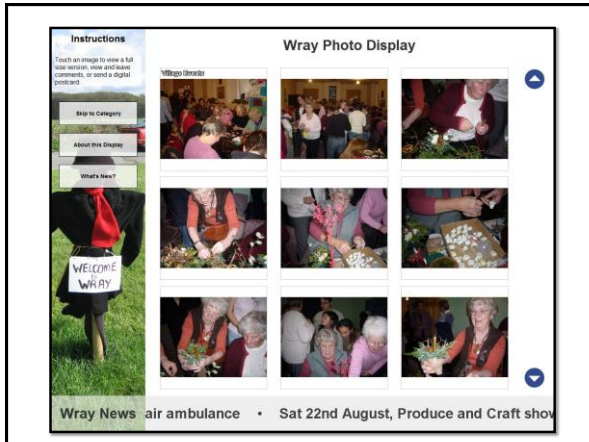
Jim and Ada Smith. Licencees of George and Dragon. 1957-1977



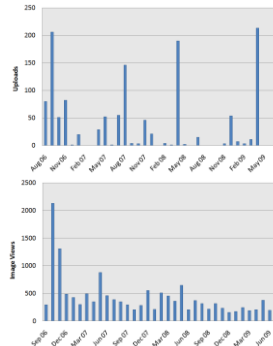
E-mail sent to Chris from one of the villagers  
(computer club member) - May 2007

"I'm sorry, but I won't be around on Thursday to go to that meeting in the Institute... but I DO have an idea - maybe you could pass it on for me.  
 "I was wondering if we couldn't make photographs of Wray and surroundings available as postcards for visitors to send. The ones for sale in the post office aren't very inspiring, and I'm sure the locals could do better! I know WE have lots of nice pictures of the village - and I'm always looking for cards myself to send to my family in the States.  
 "It seems to me they would have gone like hotcakes during Scarecrow Week, for example. Maybe they could even be free. I don't know anything about HOW to do it, but it would be nice, either as e-cards or as real, printable paper cards.  
 "Anyway, if it's impossible, at least I won't have to be there to hear the hoots of laughter!"

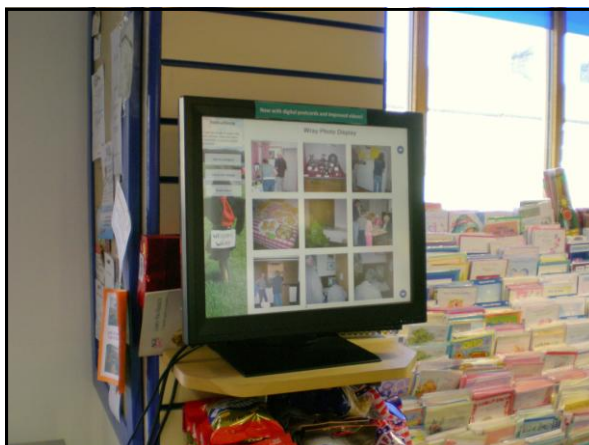
2:08 PM Chris: keep thinking about that email from xxxx and how she thought you would laugh at her and how brilliant an idea it is seems to me like most of the villagers feel the same the hardest bit is getting them to open their mouths at the right time and share their thoughts



Usage Logs...



- Village Events,
  - 378 across 8 subcategories
- Scarecrows,
  - 56 across 4 subcategories
- Wray Flood
  - 47
- Current Photos
  - 141 across 6 subcategories
- Old Photos
  - 191
- Funnies
  - 49
- Sticky Fingers craft workshop
  - 11



"good way to find out what is going on in the village, dates and times etc."

"can it be extended into an onscreen version of Wrayly Mail or village notice board"

"what about selling advertising space to villagers"

"I would like the noticeboard to showcase local businesses"

# Something fishy about doorstep salesmen

LANCASHIRE County Council is warning consumers to beware of doorstep fish salesmen fooling people into buying up to £1,000 of fresh fish.

The traders are going door to door asking householders, including the elderly or vulnerable, if they would like to buy some fish. Householders think they are only buying a few pieces, but they are handed with a van load of fish, much of it close to its use by date, and a bill for over £100.

Jim Potts, Chief Trading Standards officer said: "We have serious concerns that the fish may not be accurately described or is the correct weight, or that doorstep cooking off rights are being given."

"When buying fish this way you have no way of knowing whether it is the correct weight, the correct type of fish or even that it is safe to eat, due to how it may have been stored."

Furthermore, a lack of cancellation rights as a receipt makes any problems difficult to sort out. These traders originate outside Lancashire and the absence of a receipt makes tracing them a problem."

County Councillor Albert Arkimison, Cabinet Member for Community Planning and Partnerships, ex-

plained: "The best place to buy fish is from a reputable fishmonger on the high street or local market, or from the supermarket."

"You are entering into uncharted waters by buying on the doorstep."

"Several elderly consumers in Lancashire have been misled into thinking they are buying a few pounds worth of fish, only to be shocked to get a whopping bill for more fish than freezers can take. Lancashire County Council advises residents never to deal with unknown cold callers."

## Deals

Each year, Lancashire County Council's Trading Standards Service deals with 100s of complaints about doorstep callers from elderly and vulnerable residents and is refusing a warning to consumers not to deal with any uninvited sales people.

Anyone with concerns about doorstep callers in their area should call Consumer Direct on 08454 040066.

"Doorstep Sellers Beware - you are not welcome here" will be sent to anyone sending a 9 x 6 envelope addressed to Lancashire County Council Trading Standards Service, 3640 Cullinwall Street, Preston PR1 3NT.

## Warning to householders

**Instructions**

Touch an image to view a full size version, view and leave comments, or send a digital postcard.

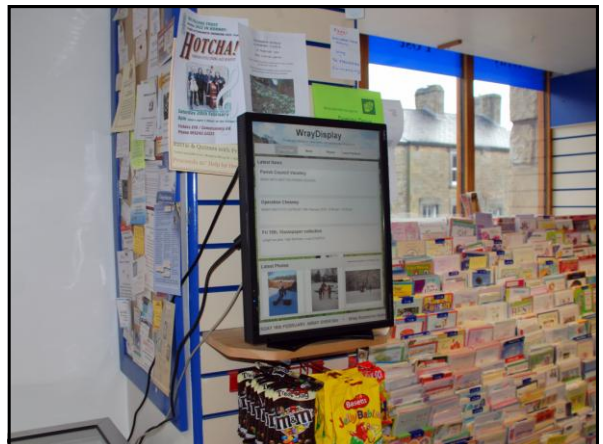
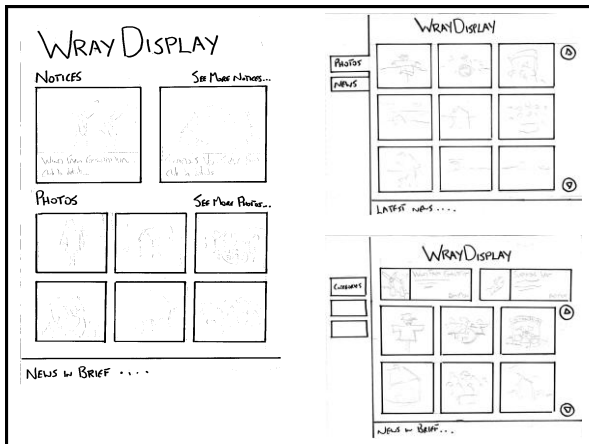
Back to Category

About this Display

What's New?

**Wray Photo Display**

Wray News - air ambulance • Sat 22nd August, Produce and Craft show



## Lessons

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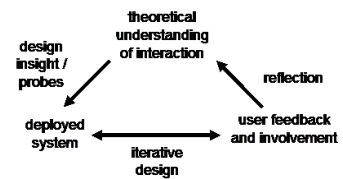
## Lessons

- Residents relate to real artefacts.
- Use a local enthusiast as a champion.
- Be flexible.
- Manage expectations.

## Summary

- Prototypes deployed in the wild for a prolonged period.
- Participants benefit from exposure to technology .
- Researchers learn about the environment and the technology.

## Pattern of Deployment based Research...



Thank you