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Using ICT to support public and private community memories: case studies and lessons learned

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Abstract

Internet communication technologies (ICTs) enable the development of memories across a variety of communities. We identify a spectrum of deployment from private through to open public spaces. As we move along this spectrum key variables change including mechanisms of trust and accountability and the definition of ownership, authorship and readership. Some challenges however, remain constant such as designing for sustainability and the need to align research and community goals.

Private spaces can be created to enhance existing interactions, develop bonding capital and build shared memory. Such spaces allow a defined membership the opportunity to explore new ideas away from the public gaze, using language which may not be intelligible to outsiders. ICTs may be used to bridge internal and external audiences, repurposing content for a wider public. The original content may require alternative presentation, organisation or navigation methods to support its effective use by an external audience.

Increasingly, community memories are being developed using social software within the public sphere, however this raises issues of authority, reputation management, and conflict resolution. Unexpected innovation may occur, and issues of sustainability must be addressed. In our analysis we will draw on three ICT initiatives in which we have participated: Bletchley Park Guides' Forum, Bletchley Park Text and Milton Keynes Open Guide.

Introduction

The focus of many early ICT initiatives centred upon assuring internet access, providing low cost or free connectivity in a community, home or work setting (Loader and Keeble 2004). However, as internet provision becomes more pervasive, community informatics research – the study of the design and application of ICT at a local geographical community level (Gurstein 2003) - is examining not only digital *access* but also meaningful digital *usage* within community ICT networks. These have the potential to enable the achievement of collaboratively determined goals, foster civic engagement (Pigg 2001) and support and sustain social, cultural or economic development within communities (Schuler and Day 2004).

Community networks can act as a “third place” (Oldenburg 1989) where people can gather informally to exchange information, bridging the gaps between face to face meetings, preserving and developing social ties that might otherwise languish (Arnold 2002). The network may afford additional means of interaction, adding to the existing “ecology of communication” (Altheide 1994) employed by members of a community, for example expanding the scope of local communication “from one-to-one to many-to-many” (Carroll and Rosson 2003).

Possible activities include supporting communication to keep in contact between face to face contact using email (Wellman 2001) and instant messaging (Foth 2004), exchange of current information using community noticeboards (Wright 2005), sharing of personal resources such as music (Bounie, Bourreau and Waelbroek 2005) and involvement in local political discussions and decision making (Cordell and Romanow 2005, Malina and Ball 2005).

Recently a number of research projects and initiatives have investigated how ICT can support the building and sharing of community memories. ‘Community memory’ is a broad concept applied in both workplace and community settings that has been used to describe the saving, representing and sharing of knowledge, supporting cooperation and collaboration in multiple task and multiple user environments (Scott, Johnson and Mundell 2000). Community memory includes both formal knowledge (procedures, databases, filing systems) and informal knowledge (personal opinions, intuitions, stories, shortcuts) (Ackerman 1994). Community memory contributes to effective decision making through the exchange of experiences (Orr 1996), provides access to an understanding of the historical causes behind common assumptions, beliefs and processes (Walsh and Ungson 1991), offers an arena for conflict resolution through dialogue (de Moor 2004) and can provide a repository for a community’s traditions, language and cultural heritage (Beaton, Fiddler and Rowlandson 2004).

Community memory building initiatives are developed for different contexts and community purposes. A key dimension on which they can differ is whether ICT is being used to support a public or private community memory. Another important factor,

regardless of whether the community memory is public or private, is how and whether the community takes steps to allow the content to be repurposed or reused externally.

Here, we consider three community memory case studies in which we have participated and draw out a number of lessons learned, identifying in particular how the public or private nature of the community memory affects its development and use. We also consider methodological issues and technical approaches to the reuse of content outside the community of origin.

The three case studies we will consider are:

- 1) Bletchley Park Guides Forum – A private community memory building initiative for a group of approximately 35 museum tour guides.
- 2) Bletchley Park Text – A visitor service that repurposes content from the Bletchley Park Guides Forum
- 3) Milton Keynes Open Guide – A public wiki for sharing recommendations of services within a geographical area.

In presenting the case studies we draw out a number of lessons concerning: the alignment of research goals with community memory initiatives; the value, openness and control of content; the re-representation of content for other audiences and feedback on its external use.

The next three sections describe the Bletchley Park Guides Forum, Bletchley Park Text and Milton Keynes Open Guide and highlight important issues regarding their development, deployment and use. This is then followed by a discussion of the lessons learned.

Private community memory building: Bletchley Park Guides Forum

The Bletchley Park Guides Forum (Collins, Mulholland, Zdrahal and Bradbury 2003) was developed for use by the community of approximately 35 volunteer tour guides. Bletchley Park is a museum dedicated to the history of computing and code breaking and was once a wartime military intelligence centre at which Alan Turing developed the

electro-mechanical decryption machine called the Bombe and Tommy Flowers developed the semi-programmable Colossus computer.

The volunteer guides' community undertakes two main roles. First, they arrange and deliver daily tours of Bletchley Park for both general visitors and group with special interest or requirements such as school parties and historical societies. Second, they research the history of Bletchley Park by conducting and transcribing interviews with people connected to Bletchley Park and collecting releases from the National Archives of official documents whose publication was been delayed due to reasons of national security. These interviews and archive documents help them to piece together aspects of Bletchley Park history still not well understood.

Prior to the development of the Bletchley Park Guides Forum (a web portal) these documents were collected annually in a printed report and a few hardcopies produced for any guide to borrow. Any documents that had particular implications for the information contained in the tour presentation were pinned on the noticeboard in the Guides' room. Other forms of communication in the community included monthly guides meetings, chance meetings with others in the guides room, notes left in pigeonholes and some email and phone contact.

Our involvement with the Bletchley Park guides was supported by the EU-funded CIPHER project (Mulholland, Zdrahal and Collins 2002). CIPHER was concerned with supporting communities of interest in actively exploring and using heritage content, including the building and sharing of community memories associated with a heritage institution.

In discussion with three members of the guides' community, two main requirements were elicited. First, they wanted ICT to facilitate the better sharing and use of the content they were collecting inside the community and also look to how this content could be made available outside (e.g. to museum visitors). Second, they wanted ICT to help with the organisation of the monthly tour guide schedule (e.g. receiving everyone's availability and allocating them to tour slots).

The first of their requirements was consistent with the core goal of the CIPHER project. Although the second was not, it was decided to also support this because having the

forum support practical community functions would help encourage use of the forum and encourage the participation of any guides not directly involved in the development of the community memory.

The Bletchley Park Guides Forum was designed and implemented over a three month period during which time members of the project team met fortnightly with three members of the guides' community to discuss design issues including the visual presentation of the forum, functionality and navigation structure. Once implemented and before launch, the forum was seeded with a set of existing content to illustrate the purpose of the forum and encourage future submissions. As part of the launch activities, the forum was presented at the monthly guides meeting, group training sessions were run and a small manual produced. The training and manual also covered some basics of how to use a Windows PC for those who were not regular computer users. To promote initial use, guides were encouraged to enter details of themselves (e.g. areas of expertise, contact details) in a Profile area of the forum. The guides who had participated in the design provided assistance where necessary for this task and also received additional training to perform administrative and maintenance tasks (e.g. setting new accounts, re-editing existing content).

By three months after launch, the forum contained 45 historical articles as well as a number of internal news items. By 18 months, the forum contained over 200 historical articles. Approximately one third of guides had made an active contribution to the forum.

During the design, deployment and continued use of the forum a number of lessons were learned. First, when undertaking a research project with communities, the goals of the research project do not always completely align with the goals of the community. For a community memory ICT project such as CIPHER, the community can be expected to want to use the technology for functions more concerned with the infrastructure of the community and its organisation as well as the building of a community memory. This may possibly be greater in communities who, unlike the guides, do not meet physically and carry out many community functions off-line. If the project team is to successfully deploy ICT for community memory they may need to allocate resources to meeting other needs of the community and account for this in their project plans. Bodies that fund

community memory ICT research may also need to expect some proportion of the allocated resources to be used to meet community infrastructure needs.

Second, community memory research projects need to design for long-term sustainability beyond the life of the project. Day and Cupidi (Day and Cupidi 2004) note that funded projects in CI in general (whether research-oriented, governmental interventions or both and not necessarily confined to the building of community memory) with their set goals and timeframes often work against the sustainability of CI initiatives. Similarly, Gaved and Mulholland (Gaved and Mulholland 2005) we point out that top-down funded CI initiatives can end once the project funding has finished. This will adversely affect those community members who have already adopted the technology.

When the project addresses specifically community *memory* the problems caused by the project ending can be expected to be significantly greater as community members will have invested significant personal time and resources building a repository that may no longer be accessible. Community memory projects therefore need from the outset to make a long-term commitment to sustainability with the community concerned. This may involve investment by project investigators beyond the funding period and must incorporate a mechanism for handover to the community so that maintenance and control is eventually in the hands of the community. For this to happen, members of the community need to take on additional roles and responsibilities. In the case of the guides, these members naturally emerged from those who had participated most in the design process. In the longer term, the community itself needs to pull through additional community members, through e.g. peripheral participation (Lave and Wenger 1991) who can take on these roles to prevent the community memory being too reliant on particular individuals who may become overburdened.

Repurposing a community memory: Bletchley Park Text

Around the launch of the Bletchley Park guides forum, the project team started to consider in participation with a small group of guides how content evolving in the forum could be repurposed for use by visitors. The resulting service, Bletchley Park Text, was developed iteratively over a period of approximately 18 months prior to its launch. A

number of issues arose during the design process. From the outset it became clear that the community had to control which content was made available in order not to disrupt the working of the community itself. For example, some resources were concerned with the running of the community and/or contained personal details such as telephone numbers. Also, some community memory resources were in development or under discussion and not yet intended for public use. The community therefore had to be able to restrict or permit access to types of resources (e.g. allow access to interviews but not group news) or individual resources (e.g. do not allow access to this draft of an interview).

It also became clear that the interface required for accessing the content from outside of the community would require a markedly different form of navigation and presentation. As the guides are domain experts, they understand the meaning of terms (e.g. Belgrade and Split were Bombe machines, Chaffinch and Dolphin were encryption keys, and a Fish was a type of encrypted message), their interrelationships and can quickly determine the suitability of any retrieved resource. Visitors on the other hand generally have little prior knowledge of the domain and terminology, and therefore require greater scaffolding of their use of content.

The design of Bletchley Park Text is described in more detail elsewhere (Mulholland, Collins and Zdrahal 2005) however its main features can be summarised as follows:

1. The visitor accesses content by selecting topics of interest rather than free text search of resources. This can be done initially by SMS text message while at the museum and later via the museum website.
2. Content related to the selected topics is dynamically organised into categories and pathways to support its browsing.
3. Conceptual relationships between categories are provided to help navigation.
4. Additional related topics of interest are suggested to facilitate further exploration of the archive.

A further design issue was concerned with how and whether the guides could benefit from making their content externally available. The decision was taken to provide facilities by which the guides could gain feedback from visitors, either explicitly or

implicitly. First, a feedback button was added to all Bletchley Park Text pages. Feedback is received by the project team and forwarded on as appropriate. Second, via the Bletchley Park guides forum guides can view statistics showing the most commonly accessed stories and most commonly specified topics of interest. This provides information on how the content is being used externally and also provides information about the visitor can that could be used when revising tour presentations. As well as providing a mechanism for guides to know about visitor reactions to the content, the Bletchley Park Text website and supporting materials also acknowledge origin of the content.

Bletchley Park Text was launched over a year ago (May 2005) and has been used by general visitors and school groups. Certain lessons can be drawn from this case study. First, ICT supported community memories can be successfully repurposed for use in other contexts by different audiences. As an indication of this, visitors have been making use of the service and a number of positive feedback comments have been received. This was achieved without disrupting the working of the private forum itself.

Second, the community of origin need to retain appropriate control over the content, in terms of which types of content, and which specific content items are made available outside. This supports the community in working effectively in private while also contributing content to the outside world.

Third, there are ways in which the external use of the content can benefit the community of origin. In the case of Bletchley Park Text this takes the form of feedback comments and use statistics. Scenarios can be envisaged where people external to the community make more substantive contributions or feedback, including the submission of new content for potential inclusion in the community memory. Externally suggesting new content could also partially become a mechanism by which new members join the community.

Fourth, repurposing content for a new audience can involve, and may require, radically different navigation and presentation. These features differ significantly between the Bletchley Park guides forum and Bletchley Park Text even though they make use of the same content.

Public community memory building: Open Guides

The previous two sections have described support for a private community memory building initiative and its repurposing for an external audience. Here we describe a public community memory initiative, set up by a core group, in which any member of the public can view and edit content.

The Milton Keynes Open Guide (MKOG) is a wiki based community guide intended to provide residents of Milton Keynes with independent information and reviews about local resources. Many sites exist that allow users to rate and review specific types of things such as pubs¹ or restaurants². However the Open Guide allows reviews or information about many types of things (e.g. parks, shops, walks, bus routes) to be accessible in one place, and links to be made between different types of entries. The use of a wiki affords a more distributed and open approach to content authoring by reducing the level of required technical knowledge to contribute. The Open Guide also helps to expand the potential author base by not requiring registration prior to adding content.

The MKOG is one of a family of community guides generically called the Open Guides. The Open Guides are a network of wiki-based online community guides each dedicated to coverage of a particular city, town, or geographical area. At present, most guides are concentrated on places in the UK, although Austria, Canada, and the USA are also represented. The Guides are all powered by the Open Guides software³, an adaptation of generic wiki principles to suit the description of items with a locative element (such as a restaurant, street, or district).

The Open Guides software is written in Perl and has a number of specializations to support the locative aspects of entries in the Guide. Any entry in the wiki can be associated with latitude and longitude data, which enables users to find other items within a certain distance of this location. Entries can be assigned to thematic *categories*, and to particular *locales*, which represent specific areas or districts. Assignment of entries to

¹ E.g. [http:// www.beerinthevening.com](http://www.beerinthevening.com)

² E.g. <http://www.restaurants.co.uk/>

³ <http://openguides.org>

locales enables users to retrieve nodes according to their location rather than simply by category, without needing to know latitude and longitude information.

The Open Guides software provides fields for users to enter specific information about an entry in the guide, such as a telephone number, latitude/longitude, or opening times. By doing this in a structured fashion machine-readable metadata can be automatically exported for use on the Semantic Web (Berners-Lee, Hendler and Lassila 2001). The Open Guides software produces RDF/XML for each node, using vocabularies such as Dublin Core⁴, FOAF⁵, and ChefMoz⁶ to describe specific elements of the entry where appropriate.

The Milton Keynes Open Guide was set up in August 2005 by two of the authors, currently PhD students at the Open University. The intention was to create a single community resource that could be widely accessed and modified, without a high level of computing skill required (Gaved, Heath and Eisenstadt 2006). While there are several local guides to Milton Keynes, these are generally centrally edited, with end user interaction limited to rating or commenting on existing entries. We were keen to move from this *broadcast* model of community information to a *shared collaborative* model of developing community memory. Key to the vision was that everybody should be able to edit any existing entry, or create new entries. Enabling easy publishing would facilitate the sharing and creation of local knowledge. Informal discussions with contributors and readers suggest that the non-commercial and independently created nature of the information is highly valued.

The Milton Keynes Open Guide was launched with a workshop in the Open University; offering people a hands on chance to explore the guide and create their own entries with the administrators on hand. The administrators sought to build a core group of contributors, and the launch event helped garner interest and establish a group of active contributors that could then draw in further participants, as well as developing their own skills. In common with other Open Guides, there was a conscious decision to support

⁴ <http://dublincore.org/documents/demi-terms/>

⁵ <http://xmlns.com/foaf/0.1/>

⁶ <http://chefmoz.org/>

increasing participation by users: legitimate peripheral participation. As a volunteer run project it is essential that additional support is gathered in order to ensure the guide's sustainability; there is no funding.

Prior to this event, the administrators had seeded the Open Guide with 50 entries, to enable the early contributors to understand how they might also add entries – it was felt important to help frame the Open Guide by presenting example content. Following the launch event, the development of the MKOG has developed steadily, with over 30 contributors adding more than 500 entries to date.

An aspect of key interest has been how the guide has evolved already, with unexpected types of contributions being added. Several lessons have been learnt even at this early stage of development. We had expected the entries to be of a geographical focussed nature as this has been concretely framed in the naming of the resource and introductory text presented on the opening page; however already we have found contributors adding entries about local history and famous historical figures, and using the guide as a place to encourage community activism (for example discussing the poor quality of local public transport). The open nature of the guide has clearly afforded a broader appropriation of the tool than originally intended.

It is clear though that the default graphic interface to the website provided by the Open Guide code base is orientated towards knowledgeable computer users, and we are currently working on a redesign to reflect the goal of attracting a broader range of contributors. Many of the options provided to users assume expert knowledge, and this complexity obscures access to the basic functions. We are working to rebuild the interface to help bring out the basic functionality.

In order to make the guide as open to contribution as possible, no registration or login procedure is required to contribute to the guide. This both has the advantage of lowering the barriers to bona fide contributors, but has also opened the Guide to the potential of “wikispam”⁷, unwanted contributions either entered manually or by automated programs. So far the Milton Keynes Open Guide has been little affected, with only one anonymous

⁷ <http://en.wikipedia.org/wiki/Wikipedia:Spam>

contributor making repeated attacks on a pizza company's entry. Other Open Guides have experienced a far higher level of "Viagra attack" wikispam, instances of new and existing entries appended with text selling irrelevant products (e.g. viagra and other pharmaceuticals), and this raises the issue of balancing 'openness' against validation of identity.

Discussion

In the previous three sections we have presented case studies in using ICT to support community memory building and the repurposing of community memories for new audiences. When a research project is used to initiate a private community member project, as in the Bletchley Park Guides' forum, a number of methodological issues need to be addressed. First, community and research goals may not completely align. Although the research project may focus on community memory aspects, the community may wish to use the ICT to support other infrastructural functions. Research projects should be resourced in order that these additional functions can be supported. This will help ensure community participation and also help the research team to gain a more holistic view of the community, beyond memory building aspects. Second, the issue of sustainability is even more pressing when ICT is being used to support community memory building rather than only internet access or communication. From the outset, the project needs to determine how the community will maintain long-term access to, and control of, the community memory in which they are investing their personal resources.

If a community memory is public rather than private then sustainability issues may be partially addressed by an expanding number of participants who may contribute content but also have technical skills that support long-term maintenance. However, a public community memory initiative has to deal with unintended uses of the technology, whether they be judged acceptable (e.g. adding historical information to a recommendation site) or harmful (e.g. personal campaigns deemed inappropriate by the core group).

Whether public or private, there is a need to seed the archive to indicate what kind of content should be contributed and provide useful content for early readers of the site.

Content seeding was found to be beneficial for both the Bletchley Park Guides' forum and the Milton Keynes Open Guide (MKOG).

Our case studies also demonstrate ways in which content can be repurposed or prepared for repurposing. MKOG presents content in a machine readable form in order that it can be harvested and included in other websites. Bletchley Park Text repurposes a community memory with different navigation and presentation features in to make the content accessible to an external audience of museum visitors.

Repurposing content can raise issues of ownership and control. With MKOG any content can be reused but should contain appropriate acknowledgement. In the Bletchley Park Guides' forum, control over access is maintained in order that the workings of the community are not disrupted.

MKOG and the Bletchley Park Guides' forum represent extremes on the public-private community memory continuum. Bletchley Park Text can be seen as one of a number of possible intermediate points in which a core group, having greater control, interact with their periphery. Our ongoing work includes investigation of other intermediate points in which the peripheral group have greater opportunity for participation and stronger ties to the core group.

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