

# Empowering Individuals and Community Groups – is Web GIS the Way Forward?

Claire Ellul, Mordechai (Muki) Haklay, Louise Francis

## **Abstract**

A key aim of government, as evidenced by the recent publication of a White Paper entitled “Communities in Control – Real people real power”, is to enhance the involvement of local communities in the decision making processes of their local councils and increase the power of local residents to influence change in their area. Fundamental to this process is the provision of timely access to information, allowing people to actively participate in decision making processes relating to themselves as individuals and to their local community.

In parallel with this, the number of internet-based Geographical Information Systems (Web GIS) applications has rapidly increased in recent years, in particular with the emergence of sites such as those underpinned by Google Maps technology. Web GIS is seen as a useful tool for conveying publicly held information to meet e-government targets, with many local authorities now utilising Web GIS to disseminate information relating to topics such as planning applications, flood risk, air quality management, cycle routes, controlled parking zones and Closed Circuit TV locations.

However, our recent work on the Mapping Change for Sustainable Communities project (working with four communities in the London Thames Gateway area to develop maps showing local development projects, environmental issues and history) has highlighted some issues with this approach, bringing to light a mismatch between the web skills of active community group members and the web skills required to access and process information provided using Web GIS. The skills required are beyond those of basic internet use (which is not a given for many community members) and extend to map reading, the ability to understand and interpret information presented in map format as well as evaluate its quality, currency and source – always assuming that the user is able to successfully locate the information in the first place.

One of our partners on this project, Planning Aid for London, was set up to provide free and independent town planning advice to individuals and groups unable to afford professional consultants, and to help such persons overcome the technicalities of the planning process. The question that must be asked now is: is there also a need for a ‘Mapping Aid for London’?

## **Empowering Communities**

The recent White Paper entitled “*Communities in Control – Real people, real power*” [7] and published in July 2008 reflects ongoing efforts by central and local government to increase community participation and generate a more vibrant local democracy. It notes that while councils remain at the heart of local democracy they should do more to promote participation and stresses the importance of access to information as part of this process. Specific duties of councils will include:

- Promoting democracy

- Involving local people in key decisions

Key amongst the aims proposed is providing more access to information, thus empowering citizens. The White Paper also recognises the link between social and digital exclusion, and aims to address this issue by exploring methods of providing information to vulnerable and socially excluded groups. Social exclusion happens “when people or areas have a combination of linked problems, such as unemployment, discrimination, poor skills, low incomes, poor housing, high crime and family breakdown. These problems are linked and mutually reinforcing.” [3]. Access to information is recognised as an important factor in increasing social inclusion.

Internet-based Geographical Information Systems (Web GIS) have long been seen as an important part of this information dissemination process with most local councils now supporting some form of internet mapping on their website. Seventy-five per cent of all information in local government is geographically referenced with 45 of the 122 national e-government priorities requiring GIS [14]. In particular, public access to corporate Geographic Information Systems (GIS) for map-based data to present property-related information (known as priority G5) has been given importance. Web mapping has also more recently hit the headlines with plans to make crime information available across the country through the use of interactive maps [1].

The use of web GIS to support information sharing is also becoming more prevalent amongst other non-governmental users, particularly with the advent of systems such as Google Maps and Multi-Map which make internet mapping more easily accessible to web developers. The BBC now includes GIS on their website regularly, with some pages focussing on user-generated content. An example of this could be seen during the recent petrol shortages, where users were asked to pinpoint sources of fuel on a central map hosted by the BBC [2].

### ***Mapping Change for Sustainable Communities***

Using Web GIS, the Mapping Change for Sustainable Communities (MCSC) project [10] (which is one of 28 projects forming part of the Urbanbuzz: Building Sustainable Communities portfolio [15]) aims to develop web-based maps to provide communities with information about what is happening locally. This includes local organisations, events and meetings, as well as upcoming large development projects and other topics relating to local planning issues, local history and issues such as noise pollution. The maps aim to act as a ‘one-stop shop’ for local information, maintained by the community for the community. To date, members of the team have worked a number of London-based communities to establish four local websites [5].

### **MCSC Workshops**

To introduce members of two of the local communities to the project and identify issues relevant to each local area, two one-day workshops were held, each attended by approximately 25 members of the local community. Attendees at each workshop ranged from members of the local council staff to individuals participants in local community groups, many of whom had a specific interest in the process of change and development in their area. The workshops were split into a number of sub-sessions, including:

- A participatory mapping exercise which encouraged groups of approximately 5 attendees to map local features, history and issues by using paper maps and stickers of varying colours to highlight different types of issue and feature. Each group was assisted by a scribe, who recorded comments made associated with each point added to the map.
- A presentation discussing local planning issues and concerns and highlighting mechanisms through which local communities can obtain information on local planning applications and decisions, as well as potentially comment on or otherwise influence these processes
- A presentation illustrating the range of spatial information available to the general public via the internet. This information includes aerial photography, street maps such as Google maps (<http://maps.google.com>) and Multi Map, (<http://www.multimap.com>), details of pollution and flood risk (from the Environment Agency's What's in My Back Yard service), the London air quality network, noise mapping (using the London road traffic noise map), transportation information (from <http://transportdirect.info>), social and economic info (from the London profiler, <http://londonprofiler.org>), and other local area profiles (<http://areaprofiles.audit-commission.gov.uk>). Additionally, the London Greenmap (<http://greenmap.london21.org>) provides information relating to green events and organisations around London, and local planning information can be gleaned from local council websites (such as <http://www.newham.gov.uk>, and <http://www.hackney.gov.uk>).

The results of these mapping exercises were digitised by the team and formed the basis of the information available on each community website. Issues highlighted by the mapping exercise ranged from concerns over noise and smells through to the importance of various historical landmarks and issues such as the lack of available, easily accessible information regarding major developments in the local area. Community engagement with the project was continued by means of a number of follow-on sessions held with participants to provide ongoing assistance with web mapping tasks.

### ***Information Dissemination***

The format of the pilot workshops made two assumptions about the communities and individuals with whom we engaged, which were in hindsight proved to be only partially correct.

- Individuals would generally have access to the internet and thus to the information that the project website aims to provide
- Individuals and communities would be internet literate enough to locate required information from diverse and multiple sources (the preliminary list above gives over ten twelve sources, with many more are actually available) and spatially and GIS literate enough to understand and be able to evaluate this information once located.

Similar assumptions appear to have been made by the aforementioned White Paper [7], which states that “the internet offers huge opportunities and we want to encourage public bodies to authorise the re-use of information”. It suggests that individuals “Go to your council website, find out about your local services. If information is not there, demand an explanation”.

## Assumption 1 – Internet Access

Addressing the first assumption, research reveals that the number of households with access to the internet has, in fact, increased to two-thirds of the population in 2007 over the last few years, jumping from approximately 50% in 2004 [4]. Amongst these, access to the broadband connections required for reasonable web GIS performance has increased to 52% of all households, or 83% of household internet connections by 2007. This leaves a total of approximately 2.7 million households with only narrowband access to the internet, limiting their access to Web GIS functionality.

The *UK Internet Usage* report [4] gives the following information with regard to the age of persons having access to the internet (Table 1).

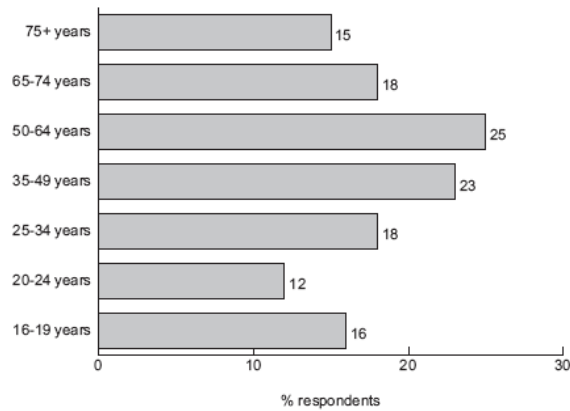
Age	% Internet Access 2006	% Internet Access 2007
16-24	83%	90%
25-44	79%	80%
45-54	68%	75%
55-64	52%	59%
65+	15%	24%

**Table 1 - Age Demographics of Internet Users from [4]**

Although demographic information on participation in local community planning and activities does not appear to have been surveyed, some information can be gleaned from the *2005 Citizenship Survey* [9]. Rather than the general volunteering activities listed in this report (which cover activities ranging from helping in a charity shop to handling money or taking part in a sponsored event and organising or helping to run an activity or event), the target audience for the MCSC project is those individuals and groups participating in what the report defines as ‘Civil Volunteering’ – i.e. “the development of strong, active, and empowered communities, in which people are able to do things for themselves, define the problems they face, and tackle them in partnership with public bodies.” The report identifies three strands of this type of volunteering, two of which are relevant to the project:

- Civic consultation, which refers to active engagement in consultation about local services or issues through activities such as attending a consultation group or completing a questionnaire about these services;“
- Civic participation, which covers wider forms of engagement in democratic processes, such as contacting an elected representative, taking part in a public demonstration or protest, or signing a petition.

People aged between 35 and 64 were the most likely to have taken part in both civic consultation and civic participation activities (Figure 1).



**Figure 1 - Age Demographic of Civic Activity Participants (from [9])**

Comparing Figure 1 and Table 1, it can be seen that whilst civic participation and consultation increases with age (peaking in particular for participants ages 50 to 64) access to the internet decreases for these groups, dropping from 75% for age range 45 to 54 to 59% for 55 to 64. This digital divide provides one barrier to information access to participants in the MCSC project (although, as can be seen in Table 1 this is slowly decreasing).

The presence of the digital divide was confirmed by anecdotal evidence from workshop participants, with issues such as no access to the internet or limited access (for example via the local library) being raised by some participants. On a more general note, there is a strong correlation between those who are socially excluded, and thus form a particular target for governmental information dissemination, and those who are digitally excluded. For example, it is estimated that 15 per cent of the adult population (more than six million people) suffer social exclusion and are also unable to use the Internet [7].

### **Assumption 2 – Spatial Literacy and Internet Literacy**

The digital divide described above is a well known phenomenon when considering community participation in decision making. However, a secondary digital divide can now be observed in the context of Web GIS – i.e. the difference in levels of online skill and the ability to identify, evaluate and understand information when browsing the internet or using internet-based applications. Here, a different definition of internet access can be used - ‘having the skill and resources to be able to use a wide range of applications whenever one likes’ [4].

This secondary divide has been observed for tasks such as searching the internet (Hargittai [8]) and Helsper and Dutton ([6]) who notes that users with higher confidence in their own abilities will achieve better and higher quality internet use (this has been measured in the context of multi-tasking on the internet – i.e. running multiple pages simultaneously). According to the authors of [6] men are more confident in their internet skills than women (68% rate themselves as having good or excellent skills, compared to 57% of women). Retired people have the lowest regard for their skills, with only 40% rating themselves as having good or excellent skills).

A similar divide can be identified in the context of spatial information and Web GIS and includes issues such as the inconsistent methods used to present information and a

lack of understanding of the context and impact datasets presented. Table 2 below lists the following tasks as being performed on a regular basis by internet users [4].

Task	Carried out by % Users
Search	90%
General interest portals & communities	82%
Software manufacturers	69%
E-mail	61%
Member communities	59%
Instant messaging	57%
Internet tools/web services	56%
Mass merchandiser	55%
Multi-category entertainment	52%
Current events & global news	50%

**Table 2 - Common Activities performed by Internet Users (from [4])**

Examining these (and assuming, as stated in the report, that the software manufacturers site access relates to automatic downloads of updates), the predominant abilities required here are those of typing in a search term and following one or more hyperlinks to a page, and then scrolling up and down the page.

However, the skills and knowledge required to operate a Web GIS are more complex. For GIS professionals concepts such layers (and switching them on and off), zooming in and out of a map, panning and clicking on the map to identify further information about an object form part of every-day language. However, these concepts are not necessarily well understood by the general public. Are users aware that clicking on a topic from a list will cause the corresponding information to be displayed on the map, and that clicking on the map reveals further information when the standard paradigm for this is clicking on an underlined hyperlink? Does the concept of zooming in or out have meaning to users more familiar with paper maps? Is the use of arrows to move the map intuitive? What happens when different Web GIS use different paradigms (for example, the London Borough of Brent uses the navigation devices in Figure 2(a), located under the map, to allow users to move around their Web GIS, whereas the Environment Agency use the device shown in Figure 2(b), located on the map itself. Do users understand concepts of scale and generalisation?



(a)



(b)

**Figure 2 (a) Moving around the map, London Borough of Brent, and (b) Environment Agency**

Another causal factor of this secondary digital divide is the issue of map literacy – the ability of the user to relate items and places on a map to the corresponding items in the real world. Research by the RAC reveals that more and more drivers are becoming dependant on satellite navigation systems rather than map reading skills, and have trouble identifying standard notation on maps (A Roads in red, Motorways

are blue) [13]. Without these skills, users will be unable to interpret information presented in map format.

Again, the presence of the secondary divide has been confirmed with our community groups, with some participants unable to locate key features of their area (schools, churches, roads) on a 2D paper map. Sporadic access to the internet also means that the advanced browsing and search skills required for Web GIS are not developed. Additionally, workshop attendees were in the main surprised by the extent of information available about their local area, and perhaps found the full range of information difficult to absorb in one session.

### ***Mapping Aid***

An analogy can be drawn between the digital divide and the digital skills divide described above and a similar issue encountered by many individuals and local communities when confronted with the complex processes involved local planning tasks undertaken by local authority or council. One of the partners on the Mapping Changes project is Planning Aid for London, which forms part of a national network of Planning Aid services which were set up in 1973 by the Town and Country Planning Association. Regional Planning Aid organisations were founded specifically to address this 'barrier' between the planning process and community members ([11]). Planning Aid can aims to help people to understand and use the planning system, participate in plan preparation, particularly in the context of their community, comment on planning applications, appeal against permit refusal and represent themselves at public inquiries, all tasks generally requiring specialist help generally beyond the means of community groups. Planning Aid is funded by the Department for Communities and Local Government and supported by volunteer town planners. In certain cases, this volunteering counts towards their Continuing Professional Development.

The experience of the MCSC team, both with this and with other projects, highlights the need for a similar 'Mapping Aid' concept in the context of disseminating information via Web GIS. This would be useful firstly in the context of bridging the digital divide by providing 'proxy' access to internet services, in a more formal context than the casual 'ask a friend' approach suggested by Dutton and Helsper [6] who note that while some people feel they do not have the skills, access or the time to use the Internet, they often know someone who could do this for them.

Secondly, and perhaps more importantly in the context of access to information, the creation of a 'Mapping Aid' organisation would help to enhance spatial data understanding and interpretation, acting as a resource for community groups to call upon in support of local projects. It would provide the opportunity to engage in long-term work with such groups, and to increase spatial literacy and data understanding within these groups by means of a targeted program of assistance starting from basic map reading skills using paper maps and building on this to train users to collect local information, capture it digitally and identify and interpret other relevant sources of information available on the internet. An important focus of such an organisation should therefore be the training of community members who in turn disseminate the knowledge and skills, but with the technical support always on tap. Mapping Aid could also provide advice to local authorities as to how best to present information (whether digitally or otherwise) to better engage with communities and individuals.

In conclusion, a number of questions: should the GI industry be looking to provide such a service in a similar context to that organised by the Royal Town Planning Institute? Who would manage it and how? How would it be funded? Who would volunteer? Would such volunteering count as Continuing Professional Development?

## **Acknowledgements**

The Mapping Changes for Sustainable Communities project was supported by the UCL-led Urbanbuzz Programme within which UEL is a prime partner.

## **References**

1. BBC News Online (2008), *Crime maps online 'by end 2008'*, article dated: 28<sup>th</sup> July 2008 [online], Available from: <http://news.bbc.co.uk/1/hi/uk/7528702.stm>, Accessed: 1<sup>st</sup> August 2008
2. BBC News Online (2008), *Have Your Say Map – Can you fill up your area?* [online], Available from: <http://news.bbc.co.uk/1/hi/uk/7453306.stm>, Accessed 1<sup>st</sup> August 2008
3. Cabinet Office (2008) *What do we mean by social exclusion?* [online], Available from: [http://www.cabinetoffice.gov.uk/social\\_exclusion\\_task\\_force/context.aspx](http://www.cabinetoffice.gov.uk/social_exclusion_task_force/context.aspx)
4. Changing Media (2007) *UK Internet Usage*, report prepared for the BBC Trust [online] Available from: [http://www.bbc.co.uk/bbctrust/assets/files/pdf/regulatory\\_framework/service\\_licences/service\\_reviews/uk\\_internet\\_mkt\\_research.pdf](http://www.bbc.co.uk/bbctrust/assets/files/pdf/regulatory_framework/service_licences/service_reviews/uk_internet_mkt_research.pdf), Accessed: 25<sup>th</sup> July 2008
5. Community Maps Websites [online], Available from: <http://communitymaps.london21.org>
6. Dutton, W.H. and Helsper, E. (2007) *Oxford Internet Survey 2007 Report: The Internet in Britain*, Oxford Internet Institute, [online], Available from: <http://www.oii.ox.ac.uk/microsites/oxis/publications.cfm>, Accessed: 1<sup>st</sup> August 2008
7. Government White Paper (2008), *Communities in Control, Real people, real power*, [online] Available from: <http://www.communities.gov.uk/publications/communities/communitiesincontrol>, Accessed: 30<sup>th</sup> July 2008
8. Hargittai, E (2002), *Second Level Digital Divide: Differences in People's Online Skills*, First Monday, Vol 7, No. 4 [online], Available from: [http://www.firstmonday.org/issues/issue7\\_4/hargittai/](http://www.firstmonday.org/issues/issue7_4/hargittai/), Accessed: 1<sup>st</sup> August 2008
9. Kitchen, S, Michaelson, J, Wood, N, John, P (2006), *Department for Communities and Local Government - 2005 citizenship survey – Active Communities Report* [online], Available from: <http://www.communities.gov.uk/publications/communities/2005citizenshipsurveyactive>, Accessed: 20th June 2008
10. Mapping Change for Sustainable Communities (2007), project description [online], Available from: [http://www.cege.ucl.ac.uk/research/geomatics/mapping\\_change](http://www.cege.ucl.ac.uk/research/geomatics/mapping_change), Accessed: 20<sup>th</sup> July 2008
11. Planning Aid (2008) *Engaging Communities in Planning*, [online], Available from: <http://www.planningaid.rtpi.org.uk/>, Accessed: 1<sup>st</sup> August 2008



12. Planning Aid for London – Homepage [online], Available from: <http://www.planningaidforlondon.org.uk>, Accessed: 1<sup>st</sup> August 2008
13. RAC News (2006), *Map Skills lost on younger generation*, [online] Available from: <http://www.racnews.co.uk/index.asp?PageID=24&category=all&Year=2006&startrow=21&newsid=68>, Accessed: 1<sup>st</sup> August 2008
14. Schmid, G (2005), *GIS in local government: Joining up geographic information*, presented at Geographical Information Systems (GIS) in the Public Sector 14th June 2005 Royal Institution of Chartered Surveyors - London [online], Available from: <http://www.headstar-events.com/gisjune/gesche%20schmid.pdf>, Accessed: 30<sup>th</sup> July 2008
15. Urbanbuzz – Building Sustainable Communities – [online], Available from: <http://www.urbanbuzz.org.uk>, Accessed: 21<sup>st</sup> July 2008

### ***Biography***

Dr Claire Ellul is a recent PhD graduate from the Department of Civil, Environmental and Geomatic Engineering, University College London. She is currently working as a post-doctoral researcher at University College London (primarily on the Mapping Change for Sustainable Communities project) and London Metropolitan University (working on AUNT-SUE, Accessibility and User Needs in Transport for Sustainable Urban Environments). She previously worked for ten years as a developer, designer and systems integrator for Spatial Information Systems consultancies, both in the United Kingdom and overseas, and completed a M.Sc. in Geographical and Geodetic Information Systems at University College London in 1998.