Smart(er) Cities with geolocative technologies

SmartCities

1. Introduction to this guide

1.1 Who is this guide for?

This guide is for managers at Local Authorities and city management, seeking new ways to deliver local services, and/or to give citizens a greater opportunity to interact with services, from reporting problems to finding the most appropriate information.

The questions we have asked are:

What's currently possible?

What's being done elsewhere?

What value can geolocation add to services?

And do we have to start from scratch in implementing geolocation or can it work within existing systems?

This guide was written for the Smart Cities project by Ewan McIntosh, from notosh.com.

www.smartcities.info

SmartCities

Why is this resource necessary?

Local Authorities have spent the last decade developing ever-more sophisticated and accessible web presences, seeking to meet the population where they are (on a PC at work or on their mobile phone on the way home from work, in the public library or on a tablet device) and provide more services online, rather than on paper or in council offices.

Most innovation in the webspace has happened independently of the services themselves, that is, the services haven't changed significantly in their offering thanks to the web – they have merely become easier to access.

New generations of mobile computing are changing that potential: it's not only possible to create more accessible services, but the very nature of services can change to better suit the needs of the citizen.

The world outside local government has seized upon the increased capacity of mobile phones to know where they are, geolocation, as a key building block of innovation[1], but references and examples of Local Authorities innovating at the same scale in this area are rare.

Where Local Authorities have excelled in some cases at innovating in terms of technology on the web, geolocation has introduced a new sense of urgency in better understanding the user, when and where they need services and through which devices or physical locations they need them. The web designer or IT department stand to gain much in opening up access by beginning to consider their developments more holistically, in collaboration with other departments and, vitally, in codesigning new means of access with citizens themselves.

[1] Mashery Helps Deliver Geolocation and Local Apps for Quova, CityGrid(R), Homefinder.com, WeatherBug and Allmenus API Leader Is First Step for Location-Based Applications, Directions Magazine, August 18th 2010: http://www.directionsmag.com/pressreleases/mashery-helps-deliver-geolocation-and-local-apps-for-quova-citygridr-homefi/129792

2. Changes in the citizen's information landscape

2.1 What are the changes in mobile telephony that are so important?

Key to the rush towards geolocation technology is the speedy adoption of smartphones.

In the UK there are more than 76m mobile phones in circulation.[2] About a quarter of the UK population now own a smartphone, and in young populations 15-18 this increases to over half.[3] Over and above smartphones, the vast majority of the population have access to "feature phones", with internet access and geolcation technology, but less computing power than smartphones such as Apple's iPhone, Google's Android-powered devices and the Blackberry RIM. Feature phones, though, are being replaced by smartphones: in the US, for every child born there are 30 Android devices activated[4], and a similar trend can be assumed in the UK where smartphone adoption rates and network coverage are greater than in the US.

If we are to look to the US we see data that backs up anecdotal evidence in the UK about how smartphones are increasingly becoming the principal or sole point of Internet access for those who have traditionally been excluded.[5] Look the trend in Asia, which the UK has followed relentlessly in terms of mobile phone devices and coverage, and we see a near future where most people access most of their Internet through mobile devices.[6]

Since early 2008 media companies have geared up their services to mobile[7], and geolocation – knowing where users, viewers or readers are – adds value in a way that regular print, television or face-to-face experiences don't.

2.2 The killer ingredient for service delivery: geolocation

Smartphone or feature phone, pretty much any phone released since 2008 is not just equipped to browse the web at low or no extra cost to the user. They also come equipped with the capacity to know where they are, using Global Positioning Satellite (GPS) technology, and/or information from the location of the nearest cell phone base station, and/or Wi-Fi triangulation. This added ingredient – which enables a website or application viewed on the device to know where the audience member is when they're accessing your content – creates new opportunities for engagement of audiences, keeping them engaged and turning this engagement into some sort of value.

---

[2] List of countries by number of mobile phones in use: http://bit.ly/aqQJfe

[3] A nation addicted to using smartphones, Ofcom, August 4, 2011. Accessed on September 5, 2011: http://media.ofcom.org.uk/2011/08/04/a-nation-addicted-to-smartphones/

[4] For every child born in the U.S., 30 Android devices are activated, Phone Arena, March 5, 2011: http://www.phonearena.com/news/For-every-child-born-in-the-U.S.-30-Android-devices- are-activated_id17227

[5] Smartphone adoption and usage, Pew Foundation, July 11, 2011. Accessed September 5, 2011: http://pewInternet.org/Reports/2011/Smartphones.aspx

[6] Trends and Popularity of Web-connected Devices in Asia, Asia-Pacific Business Technology Report, August 11, 2011. Accessed September 5 2011: http://www.biztechreport.com/story/ 1502-trends-and-popularity-web-connected-devices-asia

[7] The future of social networking: mobile phones - Times Online: http://bit.ly/cEczid

3. The challenge for cities and local government

3.1 How is geographical information harnessed currently?

Examples of innovation in the space of geolocation amongst Local Authorities, Districts, States or city halls are hard to come by: either they don't exist or cities are particularly poor at letting citizens know about them.

There are three main elements local government may wish to consider:

- What geolocation does the local authority already gather?

- What means does the local authority use to share this raw data?

- What means does the local authority use to make this data meaningful for citizens?

3.2. Local government already gathers geolocation data

In the City of Edinburgh, like most Western cities and Local Authorities, local geolocation information is already gathered, and some of it already put to use to inform citizens. For example: real-time bus times; traffic information and road closures (the Chinese Government tracks 17m mobile phone signals to spot traffic problems[8], much in the same way as Google does around the world for its own Google Maps traffic status reports[9]); planned roadworks; planning applications; school, hospital and emergency services locations; and parking locations. This information is the tip of the iceberg, and fairly common amongst cities.

But most cities and local governments fail to make that information available in its raw form or in a meaningful 'packaged' form for citizens. Let's take one example and see how it could be improved.

3.3 An example of geolocation data in use to inform citizens - almost

For example, in the capital city of Scotland, Edinburgh, parking is as much of a challenge as it is in most capital cities. Its website is fairly indicative of the challenge facing users of council or city services in many cities around Europe.

The site contains impressively up-to-date data of parking zones for residents, public pay-for car parks, on-street paid parking and free parking around the city. While performing its function to an adequate standard on a laptop of PC, it displays its innovative data on a bespoke mapping system that could be considered unreadable, slow and un-navigable on a mobile device. Their maps website detailing all public services points out that it has to be used on Internet Explorer.[10]

---

[8] *Beijing Uses Geolocation To Monitor 'Traffic', eWeekEurope, March 3, 2011: http://www.eweekeurope.co.uk/ news/beijing-uses-geolocation-to-monitor-traffic-22772*

[9] *Google Maps Gets Smarter: Crowdsources Live Traffic Data, ReadWriteWeb, August 25, 3009: http://www. readwriteweb.com/archives/google_maps_gets_smarter_crowdsources_traffic_data.php*

[10] *City of Edinburgh Council GIS Atlas Viewer: http://88.208.222.252/website/gisatlas/viewer.htm*

Why is this important? Because the need to find a parking place is most likely to arise for a citizen when they are out and about and in quick need of a spot, than before the journey commences. The user's mood, location, activity and device do not appear to have been considered in the design of a useful, interactive service, despite the fact the useful information for that very situation is deep in there.

There are a few design flaws here that are repeated in many other city or state websites designed to open up citizen services, design features that run counter to what most mobile web users expect to experience:

- Each element of parking – onstreet, public car parks, resident-only zones, free spaces – is mapped on a separate map, on a separate page of the website. Mobile users are increasingly expecting "togglable" layers of a map so that they select different options, in turn, and compare.

- It's not a map that 'pinches' very well, meaning that the increasing number of smart- and feature-phone users using touchscreen technology have trouble using these maps out in the wild.

- The maps are slow to load and reload when moved – this is an issue for people looking for just-in-time services, such as parking.

- The maps do not automatically centre over the location of the user, and do not have a simple search facility to do so, either.

Other information is just as hard to access, whether on a mobile phone or not. For example, most Local Authorities assume that parents will know their local primary school or nursery school, and therefore present these locations as alphabetical lists.[11]

And most people are concerned with planning applications near their home, yet few, if any, Local Authorities publish planning applications by their location on a map: instead, users are expected to know pretty much every other piece of information about the application (its reference number, date…) but its actual address.[12]

These are a simple examples of why geolocation and the harnessing of more widely accessible mapping technologies with which citizens are most familiar, such as Google or Bing maps, are an urgent innovation required in the city and local authority arena. So, too, is a process of codesign with users, to identify where the addition of location would help better contextualise what services are on offer, for whom, when and where.

It's not just mapping that affords opportunities for local government to make better use of geolocation technologies. The following chapters introduce the potential of geolocation technology for a variety of purposes, using real-life examples. Finally, we'll look at how you might begin the process of empowering more citizens through the formation of a meaningful geolocation strategy.

[11] Glasgow City Council Primary Schools: http://www.glasgow.gov.uk/NR/exeres/49937E8F-4D01-4973-9C3B-595F57D032F4,frameless.htm?NRMODE=Published

[12] Planning application portal for Blackburn and Darwen Council: http://www.blackburn.gov.uk/server.php?show=ConWebDoc.52003

4. How is geolocation used to make media more relevant?

4.1 GPS in mobile devices

GPS is used on a myriad of applications designed for smartphones like the iPhone, Android or Blackberry devices. These allow your location out and about to be put to good use. Here are some examples:

In iNap, users tell the application the train station they want to get off at and the app uses GPS to see when the station is approaching, and sets the alarm to jolt the user awake and not miss their stop.[13]

Locale, for use on Google Android phones, was designed to prevent your ringtone sounding out embarrassingly in certain locations (the theatre, cinema), or to set your ringtone to certain music/sounds in other locations (Van Halen at the rock concert, Lullabies at home in the evening).[14]

GoSkyWatch for iPad and iPhone uses GPS to work out your location and then reveal the night sky to you: what is it you're looking up at now based on your location and the time?[15] This brings to life something that for most people is sketchy at best, hidden by light pollution at worst.

Many hotel and train reservation apps and websites now automatically open up to suggest places to stay or the next quickest route home from your current location.

4.2. Geolocation and photography: mobile and on the desktop browser

Every time someone takes a photograph with his or her mobile phone a small piece of data is attached to the photograph: its geolocation. The geolocation is the longitude and latitude of the point where that picture was taken. Most mobile phones now add this information routinely, meaning that, when the picture is shared on a photosharing site like Flickr.com or Picasa.com, it's automatically placed on a map. You can tell if a photo on Picasa is geotagged in this way by looking at the full information of a photo (click 'More info', to the right of a Picasa example, and seek out the longitude and latitude[16]).

On Flickr, you can even look up a user's map and see where all their most recent or interesting photos have been taken globally, or within a certain location.[17]

The map can also be used to manually geolocate photographs: users can drag pictures not automatically tagged with this information onto a map, thus adding that geolocation data manually. This is a useful feature, given that most non-mobile-phone cameras do not come equipped with a GPS function.

---

[13] iNap: http://bit.ly/biD4NY

[14] Locale for Android http://bit.ly/9Zz0bu

[15] GoSkyWatch Planetarium - the astronomy star guide for iPhone, iPod touch, and iPad on the iTunes App Store: http://bit.ly/b2aJzm

[16] A photograph on Picasa that contains geolocation data: http://bit.ly/bpFBXq

[17] A user's map; zoom in to an area and click the green 'refresh' button at the bottom centre of the page to see which recent photos have been taken there: http://bit.ly/9vauXr

5. Geolocation and reinventing public services

5.1 Maps and mapping around the citizen: How are Google, Bing and other maps used?

Expeditions – tracking and reporting movement in near-real time
When Mark Beaumont set out to cycle the world and beat global records, he took with him a GPS tracker, which logged his location every so often and automatically generated a Google Map showing his route.[18] He was also able to add photos along this route in the way described in the previous section. This kind of technology is so simple that it can even be used to track a Sunday afternoon hike.[19]

The typographer and cycling enthusiast Nick Hand has circum-cycled Britain and Ireland, mapping his way live[20], and sharing 'slidecasts'[21] of local artisans as he travels. His SlowCoast[22] project is a kind of "nearly live" televisual experience, with fans keeping track of his movements through his custom-made maps, Twitter and Facebook messages.

In all these examples, the basic information – stories, photographs, podcasts, videos, locations – could have been published separately as a website, blog or Facebook update. **But having each story placed geographically helps add much-needed context, and also helps drive users from one piece of content to the next: the timeline is driven not by time, but location.**

How might this be used to make services better for citizens?

Spotting patterns, speeding up decisions
Louise Kidney, at Blackburn and Darwen Borough Council, explains the difference between how data has been gathered and used in the past, and how it is being used now to aid decision-making:[23]

The old national indicator, NI 195 (street cleanliness), involved surveying and grading "transects" for litter and detritus. A transect was a specified width and length, and had a geographical location. GPS technology revolutionised the way in which that information was used and valued. It allowed all the information to be placed in the rows of columns of an Excel spreadsheet – 900 rows to be exact.

No manager in the world is going to sit and sift through 900 rows of letters and numbers. But bring that data to life through mapping software and you can see exactly what is what, and where. The status of transects can be colour-coded – green for pass, amber for borderline, red for fail – and each plotted geographically. And any manager in the world can look at that.

---

[18] Mark Beaumont's world cycle tour: http://bit.ly/cIwzR7

[19] John Johnstone's SnailTrail map: http://bit.ly/aBLeEX

[20] Slowcoast - Last year: http://bit.ly/a4ZgaK

[21] Slowcoast – Soundslides: http://bit.ly/99XA4v

[22] Slowcoast: http://bit.ly/dpunan

[23] Location, location, location (and local government), Guardian Professional, January 28, 2011: http://www.guardian.co.uk/local-government-network/2011/jan/28/local-government-location-mapping-technology

SmartCities

Suddenly, patterns emerge. And that cluster of red dots over there to the east of your borough shows clearly where you need to divert resources; and the green cluster down to the south can perhaps afford to sacrifice some resources to make that happen. And so back you go to your street-cleaning schedules and you re-jig them in an effort to make the map as evenly coloured as possible.

No manager in the world is going to sit and sift through 900 rows of letters and numbers, but, above all, neither will any citizen. This kind of innovation, transferring longitude and latitude to a map, seems simple, but has taken Local Authorities a good bit longer than the mySociety charity, which launched the much more user-centric FixMyStreet[24] in 2007, and its mobile phone app in 2008.

FixMyStreet doesn't just show that map of "things needing fixing" to city officials, but to members of the public, too. It allowed members of the public to place an alert about something that the council needed to fix in their street (or any other street), sending an automatic alert to the council official in charge of that element of maintenance. Councils were somewhat held to account by this, as if no action was undertaken this, too, would be marked on the site as "incomplete".

FixMyStreet still exists, and is still helping citizens fix problems, but, as a product from a charity, lacks the "route to market" that many councils have to their citizens. Councils have a choice, to either harness this existing (and good) technology and channel their citizens to it, or recreate something (less good) from scratch.

Adding context to a city's history

When you have historical data, and know its location, you can combine this archive with geography to create compelling stories. The United States Holocaust Memorial Museum (USHMM) has created an in-depth reportage of conflict zones around the world based on a Google Map and sets of KML overlays (photos, videos, field updates, situation overviews, audio, satellite images, testimonies).[25] World Is Witness therefore acts as an accessible launchpad into rich content, and allows the organisation to 'cross-sell' documentary films, related blogs and websites and the work of those plugging away in the field.

Adding context to culture

Get London Reading's London Books map[26] helped this campaign provide a hook for many readers, a way of exploring over 400 books by locations they know inside out, encouraging new readers and new authors to meet on a common thread: the location of the story.

Phil Gyford, who is re-publishing Samuel Pepys diaries in 'real time' on a blog (with a few hundred years delay)[27], has tried to make sense of modern London's locations as they feature in Pepys work, through an information-filled map.[28]

---

[24] *FixMyStreet: http://www.fixmystreet.com/*

[25] *World Is Witness: http://bit.ly/c0JQZN*

[26] *Get London Reading: Books in London: http://bit.ly/cRkpwE*

[27] *Pepys' Diary: http://bit.ly/fMMGOx*

[28] *Map: London: Areas (Pepys' Diary): http://bit.ly/gn9kTn*

Culture Victoria, Australia, has redesigned its collections site, adding geolocation data to every story and artefact, meaning that artefacts and their stories can be connected to towns and cities around the country.[29]

PhillyHistory as managed to capture local interest in the city and shares thousands of photos mapping people's local history through time.[30] It's also generated $50,000 in revenue for private photos being purchased through the site[31] which, in turn, helps pay for the scanning of over two million images.[32]

Creating community art from geolocations

And you can even make art from geolocation, maps and photography. The ability to tag a photograph with its precise geolocation was the key behind the award-winning art installation, Britglyph.[33] Technologist and artist Alfie Dennen gained attention in the mainstream media as well as in online local history forums to tempt hundreds of people out into the British countryside to collaboratively produce the largest ever geoglyph. The finished photos, when plotted on a map, depicted an image of a time-piece (inspired by John Harrison's Chronometer), its chain snaking down from Aberdeen all the way to Rowlands Castle. Dennen chose the Chronometer as the image to create because it represents the dawn of the modern age, without it we would never have solved the longitudinal problem.

Managing resources across a city

Over and above storytelling or exhibition enhancement like that described before, tagging information with its location, or "geotagging", might also prove useful for institutions managing resources across large areas. For example, Oxford University has started to geotag its resources so that their movement across faculty can be tracked, in much the same way as a package from a delivery firm might be.[34] This can be done through barcode technologies or cataloguing systems where the point of entry's location is marked with a longitude or latitude – this then means that locations can be revealed through a map to the public.

Not all maps are Google Maps, though. Bing Maps' different viewing options are compelling for certain types of cultural organisation. Notable is its Ordinance Survey view, which offers up a different way of exploring space.[35] Its Aerial view allows you to provide links to users where they can view locations in 3D from a birds' eye view.[36]

---

[29] *Redeveloping Culture Victoria: Simon Sherrin: http://bit.ly/aviKqm*

[30] *PhillyHistory: http://bit.ly/c0EkA3*

[31] *MW2009 Clouds, Switches, APIs, Geolocation and Galleries – a shoddy summary: http://bit.ly/c4XZh7*

[32] *PhillyHistory – FAQ: http://bit.ly/cf4kwj*

[33] *Britglyph: http://bit.ly/9BiKw0*

[34] *Mobile Oxford: http://bit.ly/9tmM6N*

[35] *Map of Stonehenge, United Kingdom - Bing Maps: http://bit.ly/ap76EU*

[36] *Edinburgh Castle Aerial View – Bing Maps: http://bit.ly/cWzaK4*

How might you go about getting started?

Geotagging existing imagery
If you have geotagged images in a Flickr set, then you can transform that set into a KML file, a file that can be opened up and laid on top of a Google Map to create an interactive photograph layer on the map.[37] This would be hugely interesting to those following a city – or authority-wide festival or event, and might pique interest in purchasing a ticket where, beforehand, little was known about what went on in the performance and the reactions people in each location had to it.

Track a live event
Instamapper is one application, available on iPhone, Android and certain Motorola phones, that allows you to log and plot locations on a map in real time when you are out on the road. Running a Google search for "GPS tracker log on map" along with your make of mobile phone will show you other similar apps. They are commonplace.

In late 2010, Christian Payne documented his journey from Lands End to John O' Groats, surviving on nothing but freebees offered en route, in this way, tying his tweets and videos in to a real-time updating map of his progress along the route.[38] If you want to show a live updating map online of, say, your town hall debates' progress across the Local Authority, the Lattitudie app for iPhone can help achieve that.[39]

Other "live events" in city council life include the kinds of events highlighted on FixMyStreet, mentioned earlier. Cities might consider harnessing existing open source platforms like this to speed up a higher quality, more responsive service to citizens.

This "live data" is only sustainable, in fact, when the submission of such data is opened up to the public, as well as council or city officials. Let citizens keep up-to-date with the location of roadworks, blocked routes and road closures in real time, as problems occur, on a map, with messages from Twitter, photographs from Flickr, blog posts and AudioBoo audio messages automatically added to the map.

Cultural departments might be keen to work on a technologically less difficult dry run of geolocation technologies in city hall. Why not re-trace historical routes (e.g. The John Muir Way) and add video, photographic, audio and text reportage, taken from your archive or your production, to reveal the context of each location? Or make settings in existing literature and film connect to current-day locations through a custom Google Map?

[37] *AdamFranco.com » Flickr Photo Set to KML: http://bit.ly/9il5om*

[38] *The Freebees Challenge: http://bit.ly/hkLhvj*

[39] *Latitudie for iPhone, iPod touch, and iPad on the iTunes App Store: http://bit.ly/gDDnkm*

Finally, the most basic of geolocation activities might offer greatest value quickest to citizens: cities own or service large numbers of institutions which are, for the most part, currently listed on council websites in alphabetical or departmental order. The metadata has been decided by administrators and policy people, rather than users. Why not, instead, upload a database of council addresses to the Google Places For Business directory to show citizens and visitors where everything local can be found: schools, hospitals, etc.[40]

5.2 Bringing community together through geolocation

For all that cities and their authorities promote a pride in one's environment and a sense of community, there is significant growth in applications and geolocation services that help people connect with others who are, quite literally, on their doorstep. The bigger the city, the taller the buildings, the harder it is for people to connect across the hallway.

Blasterous[41] and DeHood[42] are two out of scores of primarily US applications to help people find events – or people to go to events with – in their local community:

DeHood puts your neighborhood in the palm of your hand. If you need a rich database of locations nearby, lots of great deals at local merchants, or to find new friends, DeHood gives you the rich experience of being connected deeply to your local community.

Bored? Play the new KingOfDeHood game, develop friendly competition in your neighborhood, meet new friends and get to know local acquaintances even better. Check into local shops, report deals and connect with people and you'll be rewarded with hoodbucks, points, prizes and coupons.

DeHood makes it easy to stay in touch with your friends, meet locals in real time, exchange messages with anyone you meet…

NeighborGoods[43] uses the geolocation of users to help them find people with whom they can trade or lend services and goods that would be too far to ship – "I need a ladder", "does anyone have a travel cot they could spare for my brother's family's visit to my home?".

---

[40] Welcome to Google Places for Business: http://bit.ly/ggeb1I

[41] Blasterous: http://itunes.apple.com/app/blasterous/id352675221?mt=8#

[42] DeHood: http://itunes.apple.com/us/app/dehood/id371236143?mt=8#

[43] NeighborGoods: http://neighborgoods.net/

5.3 Utah.gov: geolocation at the core of public service delivery

Utah's newly redesigned hub for citizens feels more like a new search engine than a government website. At its core is the user, and running throughout it are geolocation features, to make every search and service information as personalised and useful as possible.

For example, a look at its schools page shows that its designers have understood who the schools pages of a website are useful for most of the year: students seeking to do a school project on Utah. The page therefore starts with a pointer towards schools in Utah, but the majority of content are pointers for school kids whose assignments are running late.[44]

Once a user has specified where they are, and clicked the "Near You" button, all local services and search become geared around that location, displaying relevant location-specific information, including local meetings, local government Web sites, local school and library information, local park information, and available local online services.

The State has also launched a transparency[45] and data portal[46] which makes as much of this data as free to use as possible. There are over 400 unique geographic data sources. By allowing public access to this raw data, Utah.gov is encouraging citizens to use and merge it in new and innovative ways – giving citizens the ability to participate in making government services more effective, accessible, and transparent.[47]

---

[44] *Utah.gov Education pages: http://www.utah.gov/education/k12.html*

[45] *Utah.gov Transparency Portal: http://transparent.utah.gov*

[46] *Utah.gov Data Portal: http://data.utah.gov*

[47] *Utah.gov Breaks New Ground with Geolocation Services and Web 2.0 Enhancements, Silicon Slopes: http://www. siliconslopes.com/press-release/utahgov-breaks-new-ground-geolocation-services-and-web-20-enhancements*

www.smartcities.info

5.4 "Where are you now?" mobile applications

Facebook Places / Location services in 'Publisher Box'

From September 2011, Facebook Places is being merged with the catch-all "Publisher Box" in each user's profile. This makes telling the world where you are even more likely to happen for its 750m users as they won't have to enter a specific 'app' within Facebook mobile to do so. Instead, users can tag a place in their status update, much in the same way as they currently might tag friends to grab their attention.[48]

McDonalds were the first people to take advantage of Places, pushing certain deals to users of the app when they turned up at their restaurants.[49]

VisitBritain have created a Facebook app, accessible through the Love UK Facebook page[50], which ranks attractions in the UK, such as Alton Towers and Buckingham Palace, by how many people have checked in. It encourages venues to compete against one another[51] while providing a potentially valuable resource to tourists trying to plan a visit somewhere in the UK. At the same time, it's not requiring users to 'remember' to put in their data – it's merely harnessing data that Facebook is already harnessing, sucking it through from the Facebook Places API to its listings and presenting it in a new way. For VisitBritain this provides yet another mechanism to engage with their 250,000 monthly Facebook visitors[52] in more depth, for a longer period of time, and present better recommendations.

Foursquare & Gowalla

Foursquare and Gowalla are both web and mobile based applications that allow users to 'check in' to a venue – a shop, theatre, cinema, pub – and share this with their friends. It helps friends and colleagues meet up, helps people with similar tastes in venue to meet each other online, and there's a strong gaming element as repeated visits allow the most frequent visitor to a location to become its 'Mayor'. Users also win badges for frequent use or regular visits to similar types of venue (nightclubs, theatres, airports etc). Some enterprises, such as coffee houses, pizza stores, restaurants and even book stores, have already started offering special deals to 'Mayors' (such as money off coffee[53]).

Some companies, especially in the entertainment and food industry, have started to reward their most frequent customers by offering free meals to the current Mayor, or money-off vouchers.

[48] *Facebook's Big Privacy Changes: An Overview [PICS], Mashable, August 2011: http://mashable. com/2011/08/23/facebook-privacy-changes-guide/*

[49] *Facebook Adding Location Features This Month: http://on.mash.to/a0WgDu*

[50] *Facebook | Love UK: http://on.fb.me/dV2hCk*

[51] *VisitBritain rates UK attractions via Facebook Places app | News | New Media Age: http://bit.ly/h8bpDz*

[52] *Irish developer and VisitBritain launch Facebook Places app - Marketing - Marketing | Ireland's online business and management news service - Businessandleadership.com: http://bit.ly/hzG4vL*

[53] *Mayors of Starbucks Now Get Discounts Nationwide with Foursquare: http://on.mash.to/cbVFxh*

Disney made the choice to partner with Gowalla, creating a huge array of badges that smartphone users can claim when they check in to different rides across their theme parks.[54] The goal is to help users of the park discover new rides through the chasing of and competition for badges as well as trying things out on the recommendations of other users.

What are the opportunities in "where are you now" applications for cities?

Many cities have an ongoing struggle to encourage new groups, particularly young people, to visit museums and cultural spaces that they run. In the arts and culture world Brooklyn Museum struck out early on, rewarding whomever the Mayor was on particular days or during particular exhibitions with goodies, memberships or simply kudos.[55] Given their high turnover of Mayors (they are therefore perceived to be incredibly popular with repeat visitors) this works well to encourage more of the same behaviour.

Cities might consider rewarding Mayors of specific institutions where increasing citizen use is core to its mission: libraries, leisure centres, dentists… all places where people don't go enough but where, in return for a small money-off voucher or extra-long loan of a book, becoming Mayor might be worthwhile. Why not, in fact, encourage the Mayor of a specific type of institution each month with the lure of an audience with the real Mayor,[56] a chance to put forward one's own plans for improving council services to the woman or man at the top?

But what about the vast majority of users who will not visit often enough to become Mayor? They are, of course, celebrated: those who add 'tips' on the Foursquare app are also contributing to a body of visitor recommendations which new visitors can use to plan their visit, and regular visitors can use these tips to view the same old thing in a new light. All users are encouraged to visit three times or more in order to win a special badge for their Foursquare profile, the BK Art Star badge.

The Cutty Sark in London harnesses the ability of users to leave tips for each other on Foursquare to promote 'user-generated tours' to new visitors.[57] They also promote the user of an iPhone app, Flook, which enables users to create their own visitors cards for locations, including the Cutty Sark, advising on what to do, where to eat around the attraction and where else on the web you can find historical information pertaining to the exhibits.[58]

[54] Disney Makes a Big Bet on Geolocation with Gowalla: http://on.mash.to/fGdS6H

[55] http://www.brooklynmuseum.org/community/foursquare/

[56] Five reasons why local government should check-in to Location Based Services, Learning Pool, June 20, 2011: http://www.learningpool.com/blog/five-reasons-why-local-government-should-check-in-to-location-based-services/

[57] The Ships Blog 14th September 2010 'Free Explore London Maritime Tours': http://bit.ly/a1ikUk

[58] Find and share local secrets (Flook): http://bit.ly/az8AqB

Geolocation can also be determined without a mobile phone device, though, and without using GPS. When someone uses a web browser the IP address of their computer will reveal their location. Using this data, or indeed the data of a mobile phone's location, offers councils and cities an opportunity to better personalise content for that audience. For example, the Wikimedia charity behind Wikipedia raises funds more effectively when content is altered to display in the language of the user and with their local currency.[59]

In all these examples, the key to getting people to "check in" is incentivising the activity: in return for a click, we'll give you something. Some write this off as rewarding existing behaviours, but they'd be wrong. There is anecdotal evidence that Foursquare deals, for example, encourage people to try out locations nearby to where they are. There is more quantitative data to support this in the ever-increasing number of venues, large and small, who offer special deals to those who indicate through such apps that they are within a few hundred yards of the establishment.[60]

How might you go about getting started?

The most important thing with this area of geolocation technologies is to get started: Foursquare, for example, is still very much in its infancy but its growth resembles that of many other internet giants: its increasing use is exponential.[61]

1. Sign up to Foursquare[62] and Gowalla[63]; Log in to Facebook and check out Facebook Places; Log in to Google Places for Business.[64]

2. Make sure that your business or organisation is listed in each one. If not, add it, or use one of many walkthroughs on the web to help you.[65]

3. If you own an iPhone or Android phone, download the apps (they're free) and start using them, especially when you arrive for work in your own venues or in the venues of a tour you're on.

4. Experiment with technologies like Lattitudie before you need to use them for real, in the field.

---

[59] *Let's have the best #Wikimedia fundraiser possible IV: http://bit.ly/bo9DTQ*

[60] *Foursquare's New Deal Partnerships Are No Big Deal, Techcrunch, July 12th, 2011: http://techcrunch. com/2011/07/12/foursquare-deal-partnerships/*

[61] *Inside Foursquare: Checking In Before the Party Started (Part II): http://bit.ly/cXaqJ8*

[62] *Sign up to Foursquare for Business: https://foursquare.com/business/*

[63] *Sign up to Gowalla for Business: http://gowalla.com/business*

[64] *How to use Facebook Places for your Business, All Facebook, August 20, 2010: http://www.allfacebook.com/ facebook-places-business-2010-08*

[65] *How to use Foursquare to increase foot traffic, Fluid Creativity Blog, August 9, 2011: http://blog.fluidcreativity. co.uk/how-to-use-foursquare-to-increase-foot-traffic/*

5.5 Smart phones and augmented reality

If you know where people are, and they can view the city before them through their phone's camera, as well as through their eyes, what kind of value can you add? Well, knowing their location and, assuming some of your audience will have iPhones or Android-equipped phones, augmented reality (AR) allows you to layer the virtual on top of the real. For example, Wikitude on iPhone and iPad allows you to see information on what you're seeing as it's drawn from Wikipedia and similar sources.[66] Layar[67] is a platform on top of which web designers can code mini semi-transparent websites that display information on top of the camera view of the user. For example, when holding the camera phone up to a block of apartments, the user can see house price data superimposed on top of that live image.

What are the opportunities for local government?

Adding value (and audiences) to cultural and educational institutions
A powerful example of the technology in the world of history comes from the Museum of London whose StreetMuseum[68] brings old London to life through the lens of today's streets, parks and buildings, and challenges users to spot where old streets might once have been by paying closer attention to landmarks and quirky buildings around them. Once in the city, users of the app on iPhone are able to hold up their cameraphone to specific points in the city and see what was there before, along with historical explanations and cultural positioning:[69][70]

The Museum also harnesses the collective power of the app's users, who can use it to build their own tours, and share them with other potential visitors to London.

In Sydney, Australia, the PowerHouse Museum has taken the excellent photographic content from Sydney area, regularly blogs about the story behind the photograph they exhibit in their "Photo A Day" blog[71], and now lets users explore the photography in context all over the city through its Augmented Reality layer,[72] on the Layar platform.

Layar.com[73] is a platform on which you can build such layers of information, geographically tagged and available to those who are in a particular location. Creating a layer is similar in difficulty to creating a website; there is a growing community of developers for the Layar platform.

---

[66] Wikitude: http://bit.ly/d5U0Pd

[67] Layar: http://layar.com

[68] Museum of London - Street Museum: http://bit.ly/cBivuV

[69] http://www.petapixel.com/2010/05/24/museum-of-london-releases-augmented-reality-app-for-historical-photos/

[70] Creative Review - StreetMuseum iPhone app: http://bit.ly/eELCe2

[71] Powerhouse Museum – Photo of the Day: http://bit.ly/9fmPhm

[72] Layar: Augmented Reality browsing of Powerhouse Museum around Sydney: http://bit.ly/9QGUFT

[73] Augmented Reality - Layar Reality Browser: http://bit.ly/9a2aL2

New York's MoMA was 'taken over' by a collective of Dutch artists whose contemporary art was displayed, electronically and visible only to Layar users, alongside and in front of existing artwork in the museum. It was an exhibition within an exhibition, which is now permanently 'installed' at the museum.[74][75]

Reimaging a city's future, or a planning application

When it's possible to overlay any digital element on top of a live image of a cameraphone, making that image inch perfect in geolocation if we want, a new world of planning applications opens up. Rather than have citizens squint through their living room windows and try to imagine what the hotel or conservatory extension next door is going to look like, why not plant those 3D models as web objects in an augmented reality platform like Layar, helping citizens see now digitally what might be there for real in a few months time?

5.6 Initial planning questions for a codesign session

Why not consider a codesign planning session with some citizens and colleagues from different areas of council or city work, to see where geolocation could add the most value? Here are some questions to begin your discussions, research and brainstorming:

- What elements of council or city services are most likely to be accessed on a mobile or tablet device, as opposed to a traditional laptop or PC?

- What will the citizen be doing as they seek certain services on their mobile phone? Will they be in a rush for some information or taking their time to consider options?

- Is there ultralocal information on the number of citizens in the city who own smartphones, feature phones, or no phone at all? Does this change by area of the city?

- Do customer feedback records for the city indicate problems which could be solved or part-solved through the use of a geo-aware service?

- What council or city services already gather geolocation data? If it's already published, is it published in a way that is as useful as it could be? If it's not published, in what ways might that information be useful to citizens?

- Do you publish geolocation data in a reusable format on the web? And have you made connections with local universities, colleges or nationwide groups of open data specialists to see how they might put that data to work?

- Who could get involved in helping set up a local government or city-wide "hackday", where, in return for getting hold of city geolocation data, computer programmers can create new online or mobile services?

[74] DIY Augmented Reality exhibition MoMA: NYC http://bit.ly/bLuVHi

[75] Tamiko Thiel's work "Art Critic Matrix" (Video): http://bit.ly/briCKn

- What information is most likely to be sought out by citizens on an as-needed basis, and what information is going to be more useful when it is pushed to the user, via text message or status update? How does their current location make this information even more useful (for example, bus timetables for the stop nearest me are useful when I seek it out, less so when I'm out on a walk; the time a refuse collection truck is about to arrive, gives me time to put out the bins; but would this service be more useful offering the option "tell me when the refuse lorry has passed", in order to remove empty bins from the streets as quickly as possible?)

5.7 Measuring success

Geolocative technologies span more than just mobile: they touch mapping, your corporate website, applications on computers and on mobile phones. But measuring their impact is not as easy as counting downloads of an app, seeing how many hits a Google Map has had or observing how many people peer at works of art through the 2"x3" lens of their cameraphone.

Other third party sites have started to appear to make Foursquare and Gowalla more useful to companies. For example, FourScore helps owners of venues (and anyone else) see how they compare to their competitors over a 10 mile radius.[76] Comparisons are based on the number of checkins (therefore relative popularity) and the number of times the 'Mayor' changes (therefore implying how wide a base the clientele is). Far from scientific, such a tool is still useful in seeing, in relative terms, how you're facing up to similar institutions and companies around you. Importantly, you can also run checks on how your competitors are performing, and look into what actions they undertake with their digital media strategy that pays off in terms of engaging a digitally connected audience. Such audiences are, of course, vital in terms of spreading word of mouth as far as possible about your latest production, exhibition or show.

The key point to bear in mind as geolocation technologies like this begin to take off is that the return on investment is relatively good, even if impact initially seems relatively small. The benefits shouldn't be overstated in these early days.[77] However, these technologies cost little in terms of effort to get going, they do create excitement and appreciation from a gen-ed up audience and might contribute to more visiting from existing visitors, as well as a discovery or two from those who may not have stepped over the threshold.

Above all, any 'tips' left by people on these services should be incorporated into more mainstream media that the vast majority of your visitors use: make the feed of information from these new services highly visible on your main website homepage and in offline, paper media such as brochures and programmes.

This positive messaging forms part of a council's marketing activity, and ignoring geolocation services because a use cannot immediately be seen runs counter to the notion that a city or Local Authority should own the digital locations of the real life ones it has invested in. Get into these services, claim your institutions and build your foundations, before someone else does.

[76] FourScore: http://bit.ly/cg1XmM

[77] Nonprofits play Foursquare, too: http://bit.ly/bcuqbD

5.8 Accuracy

Most of the images online currently have hand-made geolocations, that is, someone has opened a map and dragged their photos to where they think they've taken them.[78] The proportion of accurate information should increase as more of us take and share automatically geotagged photos from our mobile phones, but bear this in mind when using services such as Flickr as the basis for any project – the results for one area may not be 100% precise.

5.9 Privacy issues

Publishing information about or from other people
Taking responsibility for sharing information about yourself on the web is one thing. But when you're taking photographs, recording video, capturing the geolocation or sharing the views of others on the web you must take every effort to make sure both you and they are aware of where this information will be posted, how it might be found and for what circumstances it might be used into the future.

Gaining written permission from people, in writing, is essential if you plan to use their images, images of them, video or film you take of them, or if you reproduce their text or ideas. This has a double benefit: it means that you are less obliged to remove the content at a later date if the person in the content changes their mind, and b) means that you force yourself and the subject into understanding how information will be used.

Permission forms must be signed by the individual if they are over the age of 16, and/or by their parent or guardian if they are under 16. Some example permission forms have been published by East Lothian Council for their groundbreaking work with social media with students aged 3-18, as well as teaching staff.

Pictures or geo-located information on yourself on the web

Geolocation brings issues over and above the use and re-use of images, audio and video of individuals. It's generally real-time data, for some duration at least, and there have been concerns raised about the security issues for individuals and their property by their openly advertising to the world where they are right now (Foursquare, Google Latitude, Facebook Places) or where they intend to be (Dopplr.com, Tripit.com).

The founders of the 'mock' site PleaseRobMe.com[79] were not out to exploit this data to show would-be robbers where the latest 'opportunities' were, but rather to point out that even in the froth of an innovation in geo-aware technologies, it's worth taking a moment of reflection as to who can see it:

"The danger is publicly telling people where you are. This is because it leaves one place you're definitely not… home. So here we are; on one end we're

---

[78] *The Hammock of Interpretation: http://bit.ly/aY8iBX*
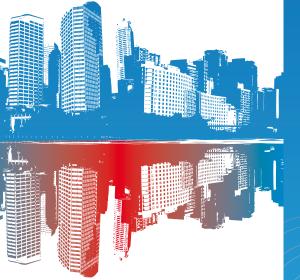
SmartCities

[79] Please Rob Me: http://bit.ly/dHN3hu

[80] Are We All Asking to Be Robbed?:
http://on.mash.to/dRss9q

[81] http://www.cdt.org/blogs/cdt/over-sharing-and-location-awareness

leaving lights on when we're going on a holiday, and on the other we're telling everybody on the Internet we're not home. It gets even worse if you have 'friends' who want to colonize your house. That means they have to enter your address, to tell everyone where they are. Your address... on the Internet... Now you know what to do when people reach for their phone as soon as they enter your home. That's right, slap them across the face.[80]

While this may seem fanciful, The Electronic Frontier Foundation points out that with a new onslaught of location-aware technology comes a responsibility that more of your potential users, viewers or customers will become aware of over time. After the initial excitement about the latest geolocation tool, it will require some careful thought to the messaging around these all-knowing services, particularly in terms of how easy you make it for people to share their data with you, with friends and with anyone else. Make sure that your visitors, audience or users are aware of what information they're putting in and who can see it: make their information use as transparent as possible. From the creators of PleaseRobMe, their plea to those harnessing location aware services:

Social networks have increased enormously in size and number. Most of them allow you to relay messages between different sites and it's easy to lose track of just how much information you might be giving away and how many people have free access to it. These new technologies make it increasingly easy to share potentially sensitive personal information, like your exact location. People might be over-sharing without knowing about it. For example, you might relay your Foursquare location to your public Twitter account and by doing this expose the message to the whole world (Twitter: Our default is almost always to make the information you provide public).[81]

The responsibility for understanding this web is undoubtedly shared between cultural organizations and their audiences, but, until the wider public's understanding becomes clearer there is no reason responsibly in the meantime why cultural organizations cannot take the lead in helping their audiences reap the benefits responsibly.

5.10 Further information:

You can find an updated list of resources related to geotagging and geolocation, including technical "how tos" at http://www.delicious.com/ewan.mcintosh/geolocation

www.smartcities.info

www.epractice.eu/community/smartcities

The Interreg IVB
North Sea Region
Programme

*Investing in the future by working together
for a sustainable and competitive region*

9 781907 576379