MAPPING AND NEW TECHNOLOGY

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Like it or not, the way we use mapping for countryside recreation is changing. As we highlighted in our 2008 scoping study into countryside recreational mapping, there is a definitive need to have a plan for the use of new media to deliver mapped information. Today public sector organisations continue to provide mapped information using the internet, but without a co-ordinated approach.   At the same time, in a world that has become obsessed with new media devices, whether it be mobile phones, tablets, hand held GPS units or Sat-Navigation systems; there are now multiple ways in which we can interact with the landscape around us. There is a plethora of new information to be found at your fingertips on single media devices, such as a smartphone, which can be used to either complement, link or even replace our 'old friend' the paper map. In effect, what you have in your hands is a small pocket Tardis, capable of telling you where you are, your altitude, the direction you are facing, access restrictions, route suggestions, tips on the route you are taking and what the weather will be like.

To provide some guidance on the current state of mapping and new media, this article intends to:

•   Examine the current types of digital mapping and electronic devices that are available for the purposes of providing mapping for countryside recreation

•   Look at how organisations, individuals and the public sector are responding to the changes in the way mapped information is presented

•   Draw some conclusions for further consideration, and to look towards where this changing technology might take us

WHAT'S GOING ON?

In order to examine the changes in the way we use mapping, it is necessary to look at the current software and hardware developments that have influenced the way maps are used for outdoor recreation purposes.

SOFTWARE DEVELOPMENTS

Mapping for outdoor recreational use has made several transitions into electronic media, including: Downloadable walks or cycle routes from a variety of websites

▪ Planning a route using mapping software packages like Anquet Maps (http://www.anquet. co.uk/), Memory Map (http://www.memory-map.co.uk/), Tracklogs (http://www.tracklogs.co.uk/) and Quo (http://www.mapyx.com/index.asp)

▪ Using the free online mapping service Google Maps (http://maps.google.co.uk/), which includes the controversial "street view" option

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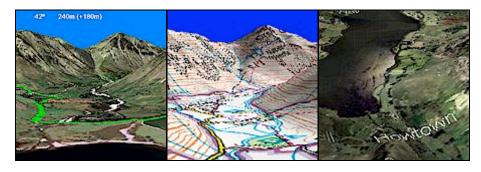*"The way we use mapping for countryside recreation is changing…"*

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PC based mapping software packages allow users to plot routes directly onto a map.

Digital mapping options allow users to interact with the map itself, enabling them to create and choose their own routes in advance of a trip. They do this by using a waypoint system in which the user places waypoints along their intended route.

Once a route is created out of a string of waypoints (for the sake of accuracy the more waypoints used, the better) a variety of useful information can be generated for example a route's length, topographical profile, etc. There's even an option to input your average walking speed, and the device will then calculate the estimated time it will to walk the route in its entirety. Maps and waypoint information can also be printed onto a route card, sent to a compatible hand held GPS unit and the route can be viewed using a 3D interpretation of the landscape, all of which help the planner to visualise and navigate their intended route.

Through using 3D topographical interpretation software found in a number of computer-based mapping applications, users can preview the landscape they are about to visit from any angle. This is a great tool for planning routes and visualising the landscape, as well as showing other people where you have been.

HARDWARE DEVELOPMENTS

GPS Receivers

When mapping became available in the digital medium it was only a matter of time before their transition onto hand-held devices such as GPS navigation units and mobile phones. If we rewind to 2006, GPS and mapping software could be hard to come by and mapping was viewed on small hand-held units. Whereas some units such as the Garmin Geko traded off functionality in order to cut back on size, the more sophisticated units which included useful instruments and features such as biometric altimeters, electric compasses, colour screens and the capacity to hold mapping software tended to be not only hefty in size, but also fairy hefty in price,

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and this was before investment in any mapping software to put on it. Yet, with ever-increasing demand for portable hand-held devices, and advances in smaller, more compact technology, the bulging dinosaurs of the not so distant past are being superseded by newer designs guaranteed not to weigh you down. Take the Memory Map®Adventurer™ 2800 for example; weighing only 135g (that's including the battery) this device is extremely pocket friendly. It also comes with British National Parks included on Ordnance Survey® Landranger® 1:50,000, with the option of buying and further Ordinance Survey® mapping up to 1:25,000 via a microSD card slot. Add to this a sharp 2.8″ touchscreen display, and you have all the information contained on a number of sheets of unwieldy paper maps, condensed into the palm of your hand.

Smart Phones

Mapping is not just restricted to GPS receivers. A number of applications are now available that bring mapping and GPS guidance straight to mobile smart phones. One of the most useful free applications for urban areas is Google Maps, which is available on most smart phones with a 3G connection. Similar in design to its online counterpart, Google Maps allows the mobile user to identify their current location, calculate routes, find local businesses (including telephones numbers and web addresses), as well as providing a basic navigation system which uses turn-by-turn GPS navigation to navigate from A to B whilst on the go. Added to this Google Maps also now comes with its controversial street view option, which allows you to view your current or desired location as if you are standing there in the street. This allows you to check that you are in the right place, or to visualise what the street looks like in advance without having to rely on interpreting the limited features shown on the map or the bird's eye view provided by the aerial satellite photo mapping.

Other types of mapping are also available for mobile devices. On the iPhone, for example, a number of different mapping alternatives can be downloaded from the Apple App Store. For on the hill lovers, a Memory Map app can be downloaded, with mapping packages starting from £19.99, while your iPhone can even take care of your car journeys, thanks to the TomTomUk app, covering the roads within UK which can be downloaded for a £49.99.

THE CURRENT LIMITATIONS OF MAPPING HARDWARE

In no other age has mapping been not only so readily available, but also so easy to store and manipulate with one's fingers. But what are the limitations of all this new technology? Well one of the most problematic issues of using any device that communicates with satellites via GPS is battery life. If using on the hill, for instance, the GPS or mobile phone might be relied on to give vital information about the landscape, to prevent getting lost or taking a wrong turn and getting into trouble, it is vital to ensure that such devices don't run out of power, especially, say if away from civilisation for a few days or otherwise without access to shops or power points.

Using mapping software is especially draining on the battery of any device as it is constantly reading positional information from the satellites. Indeed, the Memory Map app for iPhone comes with its own disclaimer: "Continued use of GPS running in the background can dramatically decrease battery life". Imagine the drama if relying solely on a mobile phone as a navigation tool in the wilds of the Scottish Highlands;

within a few hours the battery is flat and you have no way of knowing where you are or of for calling for help – a scenario that suggests that a mobile phone is not yet a substitute for 'old fashioned' map and compass.

Of course there are ways round the battery life issue. The majority of outdoor GPS units are powered by replaceable batteries, so the batteries can be replaced on the go and some of the more expensive outdoor GPS units come with lithium batteries that give a longer life. For someone wanting to extend mobile battery life while on the hill, there is always the option of buying a portable power device such as the Powermonkey-eXplorer. This provides two ways in which to recharge a device while on the go. Firstly it can ad a stored charge via the mains or USB power socket so that, when fully charged, it can keep a phone running for up to 96 hours (on stand-by mode). When that is depleted, a plug-in solar panel provides back-up power. When attached to a rucksack, this can provide a constant supply of green energy throughout daylight hours.

The Powermonkey-eXplorer is a great way of powering your mobile phone whist trekking in the great outdoors

The weather can also act against the use of mapping software on mobile devices on the hill. To guard against any internal damage it is recommended that devices are fully waterproofed. Otherwise, when caught in a downpour or battling through persistent drizzle, users might be reluctant to consult their expensive smart phones through fear of exposing to them to the ultimate arch-enemy of electronic equipment – water. Fortunately, a number of the hand-held GPS devices do come with weatherproof casings, allowing use whatever the weather. The majority of GPS unit also have protective casings, to ensure that accidently dropping them onto a hard surface will not smash into tiny pieces.

So it seems that although mapping is readily available on mobile phones, the mobile platform might not be totally up to the job of navigating a person for long periods in the outdoors. Considerations of battery life, weather resistance and durability all seem to indicate that if you want a reliable piece of kit to get you from A to B, it's best of investing in a fully fledged outdoor GPS unit. Yet, even the GPS units have their limitations. In order to work, the GPS unit needs a clear passage to the sky, to communicate with the orbiting satellites. This means that when walking through woodland or dipping into a particularly narrow valley; there is a chance, particularly

on the cheaper GPS units, that connection with the satellites will be lost, meaning the user is effectively blind until an open area is reached.

RESPONDING TO THE CHANGES IN MAPPING TECHNOLOGY

So advances in hardware and software have opened up a number of ways in which we can interact with mapped information. We shall now examine how individuals, businesses, cartographers or organisations within the public sector, have embraced the changes in outdoor recreational mapping, and look at how they are currently using this new technology.

Individuals

Social media sites such as Facebook (www.facebook.com/) and Twitter (www.twitter.com/) have made it easier for individuals to share their thoughts and experiences with their friends and colleagues. It is estimated that around 550 million people now share photos and other information on Facebook, not to mention the many other social networks. As the mobile internet develops, more and more individuals are posting information on their outdoor experiences, particularly in relation to the routes they've taken and or photos of the sights they've seen. This information is either shared through social networks sites, such as those mentioned above, or through personal blogs sites such as tumblr (www.tumblr.com/), wordpress (www.wordpress.org/) or livejournal (www.livejournal.com/); picture sharing sites such as Flickr (www.flickr.com) websites, such as www.walkingenglishman.com or discussion board forums, like the Trail Magazine forum (www.livefortheoutdoors.com/Community-Landing/Forum-Landing/). A number of these sites encourage social interaction, allowing an individual's friends to comment on their statuses, pictures or blog posts and leave their own feedback.

Businesses

This feedback approach has also been embraced by commercially operated sites, such as www.walkhighlands.co.uk and www.walkingworld.com, whereas other sites, like http://www.endomondo.com/login look towards tracking and sharing users' achievements. These websites are examples of innovation in this field. They generate revenue through sales of electronic maps, membership and advertising to make profit and deliver a range of subsidiary objectives, including supporting the rural economy and providing up-dated information on changes on the ground to walkers and other countryside users. Other outdoor recreation websites have incorporated interactive mapping, such as the British Waterways' website (http://www.waterscape.com/in-your-area/cumbria/map. This allows users to change and modify the map in order to see certain features and attractions within a specified region of the country.

As mentioned previously, the four leading suppliers of electronic mapping and mapping software (Anquet, Memory Map, Tracklogs and Quo) are also developing their products and services to draw in new markets. Quo, for example, has a birdwatchers diary (http://www.mapyx.com/quo/using_digital_mapping.asp#body_top) in its mapping package, allowing users to locate and share sightings of rare birds in text, video and sound with friends, other birders and County Bird recorders at the press of a key.

Cartographers

The Ordnance Survey is working hard to promote traditional map reading skills through its education programme and at the same time responding to the digital challenge. Maps up to 1:50,000 scale are now available free on-line and the O/S has worked with a number of businesses to make it's mapping available electronically under licence. The OpenData section of the O/S website (http://www.ordnancesurvey.co.uk/oswebsite/opendata/) allows other businesses to incorporate O/S mapping onto their own websites.

Public Sector

A number of Local Authorities publish mapped information on-line, either to comply with legislation (definitive maps in England & Wales and Core Path Networks in Scotland) or to promote recreation and tourism. Some authorities see this as a means of avoiding expensive print costs, but without supporting promotion, their efforts can have little impact.

National agencies are responding in different ways. Following research into 'Countryside On-line', which identified demand a demand for on-line mapping from existing and potential new visitors to the countryside, Natural England (www.naturalengland.org.uk/) has struggled to make a business case for progressing the project. In Wales, Countryside Council for Wales (www.ccw.gov.uk/) first made online mapping available in 2005, in order to promote open access brought about by the CROW[1] Act in 2000. They have recently reviewed its design and content, and have re-branded it as 'Outdoor Wales onLine'. In addition to this, they have also added new features including a bigger map window, promoted walking and cycling routes, sites to visit, water related recreation, such as paddling and sailing, and visitor information (car parking, public toilets accommodation, etc). In Scotland, following an independent review of its on-line mapping, Scottish National Heritage (http://www.snh.gov.uk/) has had a radical re-think. As a result it has re-designed its existing on-line mapping to better meet the needs and abilities of users and is working with the commercial sector to provide effective mapped information without significant cost to the public purse.

SOME ISSUES: THE FUTURE OF OUTDOOR MAPPING

WHERE DO WE GO FROM HERE?

The development of electronic mapping presents some big opportunities, including promoting the rural economy and heading off access problems by providing:

- Up-to-date information on changes on the ground

- Information on visitor facilities

- New interest in routes via social media sites

With devices capable of storing electronic maps getting smaller and data storage capacities and screens (for example iPad) getting larger it may not be long before we

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[1] Countryside and Rights Of Way Act 2000

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see very slim-line devices capable of storing vast amounts of mapping data, perhaps even with the option to view in 3D from any perspective. However, until the battery life and water resistance of mobile devices improve, they will not become an alternative to a paper map.

Can the map makers find a way to generate revenue by providing maps in electronic format and business models that can tread the line between providing high cost, printed maps and on-demand, electronic mapping?

How can the public sector achieve its objectives for mapping in a financially sustainable way? Is working with the commercial sector the best option? Will current business models prevail in the face of software and hard ware developments and increasing IT capability amongst the public?

Is there sustainable business case for providing information to promote the rural visitor economy and can this be delivered effectively through mapped information?

One final thought – who is developing policy in this area? Mechanisms and funding have disappeared at a key moment. Is it time for the national agencies to work together, sharing their experience to develop consistent approach and to provide guidance to local authorities and others?

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