Managing Data Licensing Need Not Be a Problem!

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SUMMARY

Sarah James of Mouchel and John Richardson from Innogistic explain that managing Data Licensing need not be a problem and, if done correctly, may even lead to some unforeseen and surprising benefits – such as a Spatial Data Infrastructure.

Are you ready to move your Digital Rights Management (DRM) and data licensing from the filing cabinet to your Spatial Data Infrastructure (SDI)? How and what would you think about when you decide to build or enhance your SDI?

So what is the answer? How can licensing be simplified and managed? This presentation outlines just one approach to the problems.

The presentation summarises how consulting and business services group Mouchel met the problem head on, showing how good and efficient management of licences within an SDI has the potential to make GIS as high profile, useful and relied upon in the boardroom as project performance and finances.

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MANAGING DATA LICENSING NEED NOT BE A PROBLEM!

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1. THE COMPLEXITY OF DRM

The subject of Digital Rights Management (DRM) and data licensing can seem daunting. Last year's 12-month sentence and £2.5 million fine handed down by Swedish judges to the four individuals behind file sharing site 'The Pirate Bay' has shot the topic of digital rights back into the headlines.

The legalities of data licences and copyright are not just an issue of concern for the entertainment industry. Geospatial data providers have always steadfastly protected their Intellectual Property Rights (IPR) but the advent of the Internet has presented new challenges for policing these rights. Increasingly sophisticated detection methods now mean that data users and geospatial practitioners need to be much more aware of the implications of contravening IPR, accidentally or otherwise, given the global nature of the internet. This is particularly relevant due to the increased level of discussion around the freedom of the internet and Google's fight against alleged state censorship in mainland China.

There are as many public data access models as there are countries in this world. In some public data is free and available to everyone whilst in others it is only available if you are not making a profit from it. Some the data is restricted access whilst in others it is relatively free access. Access is often tied to the nature of the data as some countries (like the UK) have highly developed large scale datasets which cost a great deal to collect and maintain whereas other countries have no such high-end datasets except where charity lead data collection activity has occurred often following some form of natural disaster. In this complex world, it is no wonder that there is confusion over who should have ownership and responsibility of the datasets.

It is this perceived legal complexity, combined with the time-consuming and resource-hungry nature of properly managing data licensing, that can cause an organisation to metaphorically 'hide the whole issue behind the filing cabinet', hoping it will just go away and the data provider will not notice any misuse. Because of this attitude DRM was an area which particularly concerned the Geospatial team at International consulting and business services group, Mouchel. Rather than hide DRM behind the filing cabinet, Mouchel decided it needed to face the challenge head on, starting with the complex situation which currently exists within the UK. It was concerned with the potential risks of copyright infringements and felt that ignoring the issue, like many other organisations do, was an optimistic and unprofessional approach that would not stand up to scrutiny should a legal challenge arise. As a result,

Mouchel decided to review the whole process and put in place a new, automated, solution which could manage the entire DRM issue, thus removing the onus from operational staff. The heightened prominence of these issues has led to increasing debate around DRM. With the INSPIRE Directive scheduled to come into force soon, the proper management of DRM and data licensing is now more critical than ever. The Open GIS Consortium GeoRM working group has done a lot to develop an international standard for the management and protection of Intellectual Property. Those with an interest and a view to express can do so on the working group's website at: http://www.opengeospatial.org/projects/groups/geormwg.

The UK's famous national mapping agency, Ordnance Survey, announced a consultation regarding its proposed new strategy in December last year. As well as unveiling its future online offerings, it makes reference to forthcoming and continuing reviews of licence terms as part of the plan to 'improve ease of access to geographic data and services'. Recent licensing initiatives from Ordnance Survey, such as the Multi Client Contractor Licence, have certainly helped reduce the stress levels of UK based GI Managers. As a result of its depth of experience in using Ordnance Survey's geospatial data and first-hand knowledge of the problems of the corresponding licenses, Mouchel was able to provide a lot of useful feedback and formally replied to this consultation in March of this year. Yet all this activity, while highly necessary, seems only to heighten the perceived complexity of DRM to the sharp-end GIS/CAD user and make it appear even more overwhelming.

In parallel, the concept of Spatial Data Infrastructure (SDI) – considered the Holy Grail of the GI world - has also sparked a great deal of debate. Initiatives such as the European INSPIRE directive, MEDIN (the UK Marine Environmental Data and Information Network) and VISTA (the utility companies' lead project on visualising integrated information on buried assets to reduce street works) all seek to provide a common framework in geospatial data, metadata and digital infrastructure within their various spheres of activity. The Open GIS Consortium overarches all of this and provides a framework of standards on data formats and transfer protocols such as GML and WMS / WFS to bring uniformity to important areas of the GIS world. Despite all these efforts, interpretation issues are already beginning to surface as geospatial system suppliers take different views about translating these standards into practice, potentially sparking a costly format war. But data, metadata and data transfer is only a portion of what can be considered to be an SDI in its entirety and the environment within which any geospatial data is used and the infrastructure through which it is transported to the user is also of vital importance. What is noticeably lacking within all of these directives and initiatives is anything which addresses the licensing of data. Rather than being addressed the subject is side stepped as being the sole responsibility of the data providers.

So what is the answer? How can Geospatial Data Licensing be simplified and made more manageable? And should an organisation go to the expense of changing, updating, rationalising or standardising their geospatial operations to create their own resource centre within the larger international SDI? Almost by accident, Mouchel found that solving both SDI and licensing challenges did not necessarily require major reconstruction within their own geospatial network. The company did not specifically set out to create an SDI. At the outset, the particular areas of interest were DRM, guarding against the risk of infringements

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and the management of OS MasterMap data. However, by taking an holistic approach to these challenges, Mouchel's geospatial team found itself implementing a solution for DRM that created its own SDI - with benefits.

This paper outlines the methodical approach that Mouchel's UK division took to addressing the thirty-one business requirements that needed to be resolved in order to manage DRM and thus facilitate the implementation of SDI. By breaking the whole task down into manageable segments, similar to that of a contract review process, Mouchel has demonstrated that the issues surrounding licence management can become less onerous and can also open up new opportunities for SDI development and implementation.

2.   OUTLINING THE PROBLEM

Mouchel provides many of the design, managerial and engineering services that support modern society across the globe. The company works with a variety of organisations in both public and private sectors in many different countries, across a wide range of infrastructure projects. As a result, its GI professionals need to manage a vast array of different geo-datasets assigned to them under various client licences. The management of this data and its corresponding licences had become a time-consuming and resource-hungry activity.

Within Mouchel there is a culture of risk mitigation. Employees are encouraged to always identify and highlight potential risks in order to face them head on and to collectively find a solution, an approach that is proving particularly valuable in the current financial conditions. This culture is borne out of the engineering business, which is also focused on risk identification and management in terms of delivering client requirements and contractual obligations.

Mouchel UK GIS management team already had a good understanding of licensing but map data is used across the entire Mouchel business by many people accessing corporate GIS, CAD and other systems. It is the sharp-end data users who require supporting processes or technologies to ensure that they work within the terms of the licences. Concerns had also emerged about the uncontrolled use of free on-line mapping services which might inadvertently result in licence infringements.

3.   IDENTIFY THE RISKS

Faced with these challenges Mouchel's team decided it needed to put in place a system that would manage all data in a more efficient manner and that could reduce the risks associated with DRM and licensing. Later it was recognised that this system was essentially an SDI. In order to identify challenges and to scope out the project more fully, the Geospatial Systems team undertook an internal survey of how and where geo-data was currently used within its UK operations. The results proved very interesting.

Not surprisingly, a large number of survey respondents said that they were not aware of the digital rights compliance issues around the usage of map data, nor did they fully appreciate that the free use of internet mapping services such as Google Maps and Multimap is restricted for commercial use. In addition, a number of Ordnance Survey data users were unaware of the need to keep track of data licensing obligations or of constraints related to onward data recipients and restrictions on future retention and use of the data.

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In order to overcome this apparent lack of awareness, Mouchel's GI team asked for volunteers (called 'Champions') from across the organisation to act as points of contact for queries and questions on geospatial data management. This team of Champions provided crucial insights into the requirements for the solution. Finally, Mouchel conducted a series of road shows and developed a collection of pages on the company intranet to highlight the importance of digital rights compliance.

Many of the questions that came back from this consultation process centred around the control of free on-line services such as Google Maps and Multimap to ensure compliance within the overall Mouchel environment. These services are aimed at members of the public and are generally not for commercial purposes but if used by unsuspecting employees there could be unforeseen licensing implications. This evidenced the need for a more holistic approach and began to feed in the elements that needed to be considered for SDI. The Geospatial team considered whether these services should have a place within Mouchel's corporate solution or whether restrictions should be put in place so that Ordnance Survey becomes the main - or even the only - map data provider for all UK based applications? There were inherent risks in allowing free viewing services within the GI solution, not just in terms of licence infringement but also for cost association and benefit realisation. There was potential for inaccurate 'generalised' data to infiltrate activities where accuracy and data integrity are paramount. Conversely however there is little point in requiring a download of OS Mastermap Topography layer if someone only wants to view a simple small scale map of a particular area.

To mitigate the risks of licence infringement, the solution needed to provide a "free viewing service" that would draw its small scale data from the central Mouchel data store, thus ensuring that data was properly licensed and available to view by all Mouchel staff. This marked the first phase of maps@mouchel. Phase two, later known as "The Licence Logic Engine" was a larger project that would provide the ability to set up boundaries for a geographic area based on the data licence conditions for that project. Once developed, it provided more detailed analytical tools, as well as the ability to download, print and serve data using Web Map Server (WMS) and Web Feature Server (WFS) protocols. In this way the GI team could also ensure that when complex data is needed it could be accessed by any GIS/CAD package, ensuring a consistent and accurate service delivery to all clients whilst properly managing licences.

4.   OUTLINE THE USAGE

Discussions around the "view only" facility provided useful guidance for Mouchel's Geospatial team. It was clear that the whole manner in which the business used geospatial data and the type of data needed should be looked into as well when examining license management. This included a stock-take of all the different types of Geospatial and CAD applications from different software providers in use within Mouchel, its partners and contractors, with which the final solution would need to be integrated. This part of the study proved particularly important due to the variety of different packages used by Mouchel staff and external clients, as well as all the different existing databases. As a result of the wide

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variety of software to which data needed to be served it was immediately apparent that conformity, standardisation and rationalisation within the Mouchel environment was not an option and that a more open SDI-type solution would be needed. The wider range of current software used (e.g. Microsoft Office, etc) and the infrastructure of the company's network including WAN links and servers were also assessed at this stage.

All of this was used to develop a model of geospatial information usage which, while apparently obvious at first glance to the GI professional, proved highly useful for understanding and planning the requirements of GI usage across the wider organisation. *See Figure 1.*
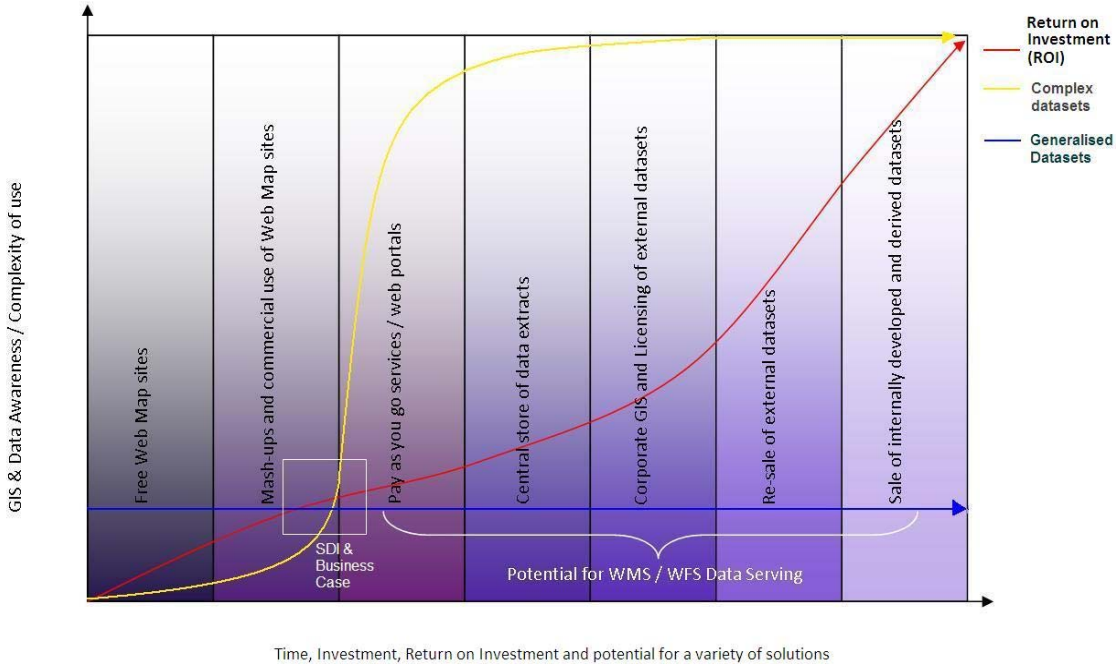

Figure 1 Geospatial data usage model

The survey unveiled that, while there is huge diversity in usage and software types, greater control over geospatial data and mapping services was required within all of the groups in order to allay the risks of non-compliance. The outcomes of the study also revealed a further opportunity: the automation of some of the more common licensing tasks could free-up operational staff from time-consuming data management and administration and allow them to concentrate on value-added activities that better serve clients' needs.

At the time of scoping out the project there was much discussion about how far the solution should assist with licensing management and whether or not the engineers needed to retain some 'hands on' management, and thus an understanding, of data licensing. The final conclusion was that the solution should give all the tools needed to manage the project without the worry of data licence management. This would then allow staff to focus on the

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job, enabling the technology to manage the licences and allow the Geospatial Systems team to provide GIS consultancy, guidance and advice when required.

Mouchel decided to address the bulk of the licensing issue through the Ordnance Survey's recently launched Multi Client Contractor Licence (MCCL), which would allow Mouchel to hold its own Ordnance Survey dataset for use on public client contracts. Only one copy of the data would be required - held on Mouchel's central database - instead of multiple data extracts from each public client. Links to a central store of current contractor and subcontractor licences were still required but the MCCL facilitated a move from paper licensing to automated DRM. At roughly the same time, Ordnance Survey announced the Scottish Framework Agreement, a new cross governmental agreement granting data usage in all local and national government departments in Scotland. This differed slightly from the UK agreements so required careful consideration was needed to allow for this too. However, following this, all the pieces were now in place for the final solution to be developed.

5.   SOURCING THE TECHNOLOGY

After fully exploring the requirements of the solution, Mouchel went out to tender to source the application. This was a challenge as, at the time, it was unclear if such a solution even existed! There were several available options that addressed some of the demands but nothing that covered every aspect. In the end it was decided to develop an entirely new solution with a licence logic engine at its core, so as to meet all the requirements. To build this new solution, Bristol based software developers, Innogistic were appointed to construct the solution in consultation with Mouchel. It included the ability to serve data direct to the user through a WMS / WFS web portal and could be housed within the Mouchel's own IT infrastructure, allowing the company to effectively manage its own central datasets and associated licences. The final solution has now been given the product name of Maps@ and within the specific Mouchel environment it is also known (not surprisingly) as maps@mouchel.

The Mouchel GIS team worked with the Innogistic developers to create a web portal. This would be accessible across the company but would serve only permitted data extracts to authorised users under centrally-defined permission levels managed by the GIS team. This key licence management functionality means that only the correct data for a specific geographically-defined project area is served to the operational teams. This cuts out time-consuming administration, significantly reduces the risk of IPR infringement and automatically provides an audit trail showing which user accessed any given data, when it was accessed, and for which project it was used. The Maps@ solution also permits Mouchel to serve its own corporate online map viewing service without the possible misuse of map data, further minimising the risk of IPR infringements.

For the Mouchel GIS team, one of the main benefits of this new system is that it allows for the central management and distribution of a single, complete geospatial database, rather than having to manage multiple data extracts from their vast range of different public sector clients. Centrally managing geospatial information in this way has meant that Mouchel can be certain that there is data currency and accuracy across all projects. It also ensures that any changes or updates to data will come directly from the data provider rather than via the client

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and these changes need only be uploaded once to become instantly available across the whole company.

The survey results also highlighted the diversity of applications which will interface with the system. It was therefore paramount that the Maps@ solution could serve and allow data access to and from the wide variety of GIS and CAD systems used across the company in delivering client projects. Maps@ employs both a web-based map portal for data selection and download to basic CAD or imaging tools and an OGC WMS / WFS compliant interface that allows it to serve the data directly into all market-leading GIS and most advanced CAD systems.

6.   TESTING AND ROLL-OUT OF THE TECHNOLOGY.

As would be expected of the installation of a radically new system of this nature, it was important to test the separate elements of the solution as individual entities as well as testing the system as a whole. The various elements of the solution founded on Maps@ were first held on remote servers - separate from Mouchel's main live system - to allow for the testing needed within a safe, 'risk averse' environment. All elements of the solution were then put through a stringent regime of testing and were closely monitored to ensure optimum performance. The Champions were invaluable at this point, tasked with effectively trying to 'break' the system by testing it to its maximum in the virtual environment so that solutions to bugs and error messages could be found before the system went live to the whole company. Similarly, a programme of 'load testing' was also undertaken. This series of tests deliberately overloaded the whole system and architecture to identify the point at which it would begin to fail, those elements that would failed and to find out where extra resource could be brought in if demand neared these critical points. These tests not only included the physical solution and its elements but also the wider network infrastructure, IT personnel and other vital resources involved. Awareness of the system's limitations meant that potential challenges had already been overcome before the solution became operational, which made for much easier management in the live Mouchel working environment.

Following this rigorous testing, a plan was drawn up for the roll-out and implementation of the solution, which addressed the financial resources required as well as plans for linking into existing live infrastructure such as the Windows Active Directory. Finally, a Disaster Recovery Plan was formulated in case of catastrophic failure during installation or thereafter. It is obvious that many people with the right experience and knowledge are required to install such an ambitious system and Mouchel was able to draw on its dynamic and experienced pool of staff for ad-hoc project management. A development, testing and roll-out team was assembled in-house, with considerable experience in IT, Geospatial Systems management and development, software development, licensing, data processing, project management and communication management. This team also included technical consultants from Innogistic, and business analysts from Mouchel's corporate team to ensure that the benefit to Mouchel, outlined in the original business case, was correctly measured and attained.

With all these elements in place, the company-wide solution was finally ready for roll-out. Phase one, the view only portal, was initially delivered in October 2008 but held in the remote environment. Phase two, including the detailed selection and analysis tools, download, print

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and WMS/WFS elements, was delivered to the remote environment later. The full solution was transferred from its environment outside the Mouchel network and went live across the company in August 2009.

One particular lesson learnt during the roll out concerned the data structure going into the SDI. The business plan needed to give the specific format for the data and metadata, bearing in mind the future usage and development of SDI. This format had to be rigidly enforced from the outset with clear procedures to follow in order to manage and store large datasets and to encourage future interoperability. This helps to maintain the data to a very high level and to maximise its future uses. These standards ensure that the system can make quick, efficient and effective translations of the data into other formats, giving the flexibility needed for interoperability. The data store can grow in size, usage and usefulness over time. Similarly the standards can also grow with the development of SDI.

7.   THE PAYBACK

There is no denying that maps@mouchel - as the solution is now called internally - is bringing benefits to Mouchel. During the implementation of maps@mouchel a thorough cost/benefit study was undertaken. The results showed significant cost savings across the board totalling around £388K per annum. Savings identified include time costs for managing the licensing process as well as cost savings from simplifying the number and complexity of licences required. However, the biggest savings came as a result of the need to only purchase, store, manage and serve one set of geospatial data for all UK Public Sector requirements rather than using and managing multiple data extracts. Project managers and engineers can now access relevant, project specific and up-to-date mapping data without worrying about licence infringement or the time-consuming administrative tasks around data licensing. Significant improvements have been made in business processes as well. The Champions were brought together on 1ˢᵗ June 2009 for an initial review and 83% of them said that the maps@mouchel solution brings 'added value' to the client.

8.   THE FUTURE

Following the development of the data usage model (Fig 1 above) it became apparent that there was a further opportunity for exploitation of maps@mouchel. At last year's Ordnance Survey Partner Conference, Mouchel signed up as a fully-fledged Licensed Partner. Now that all the necessary licensing is in place, Mouchel is looking to develop the maps@mouchel system to service its large private sector clients, who have their own agreements with Ordnance Survey. This will involve developing a pay-as-you-go system for both public and private sector projects allowing on-demand purchase of additional data for clients whose data requirement falls outside of current agreements, and could involve working in partnership with other data providers and distributors in the future. The importance of maps@mouchel has now been recognised within the company and as a result has been moved from the specialist Geospatial Business area to become a Mouchel Group function. Maps@mouchel is now seen as an increasingly important tool for sectors of the business including GBS, Utilities, Roads, Rail etc.

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9.   CONCLUSION

So is licensing as daunting as it first appears? The answer is no. Provided a methodical approach is taken, the management of data licensing can be simplified and can even provide an opportunity to improve efficiency in business processes and cut out cost as Mouchel's case illustrates. More significantly, Mouchel used licensing as a platform from which to review and develop facilities in its geospatial architecture, instilling a new SDI way of thinking which will bring rewards in the future as international consensus is reached.

From this, we can see that licensing can be a framework upon which to implement SDI which is functional, effective and efficient. The implementation of maps@mouchel will create both short- and long-term returns on investment by putting in place flexibility for future SDI development. It has also brought business benefits through reducing the risks associated with possible licence infringements and helped reduce the administrative burden placed on project management staff.

The development and adoption of this SDI approach has been particularly gratifying for those involved with data management and has introduced the culture of SDI as well as the infrastructure so that any future projects will be in harmony. To illustrate this, throughout the project to develop Maps@mouchel, a watchful eye was kept on the development of the pan European INSPIRE directive. This has meant that the Maps@ solution has been developed with the capacity to expand into a future International arena. There is also the potential for the solution to be further developed to link with Mouchel's Corporate intelligent SAP based applications, called Connect, which will bring the benefits of the solution to Mouchel's Global audience.

However, in order for the GI user community to gain maximum benefit from system improvements such as Maps@, there needs to be a more pro-active approach from the data providers towards simplification and standardisation of licensing agreements. Hopefully, we are seeing this process begin with the Ordnance Survey's latest review of its licensing in the UK and the formation of the OGC GeoRM working group for international standardisation. All of this will only help to improve the possibility of a wider (possibly even global) SDI, which will benefit all users of geospatial information. Of course this is also dependant on system suppliers singing from this same hymn-sheet, which in SDI terms relates to the translation and implementation of international standards within their solutions.

Within the GI user community there needs to be a desire to create greater awareness, at the boardroom level, of the risks and impact that non-compliance with digital rights can bring and the cost benefits that proper Digital Rights Management and compliance with international SDI initiatives can provide. Naturally there needs to be a co-ordinated approach, with Senior Management seeing the bigger picture whilst learning about the details from their technical teams, in order for a solution such as Maps@ to be implemented. But the payoff will be particularly beneficial to the implementing organisations. Most importantly, good and efficient management of digital rights has the potential to make geospatial analysis as high profile, useful and relied upon in the boardroom as project performance information and the balance sheet. Creating an SDI with DRM should leave a long-lasting impression on any organisation.

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BIOGRAPHICAL NOTES

Sarah James is a senior GIS consultant at Mouchel and a chartered Geographer. Sarah manages maps@mouchel, the company-wide project to centrally manage and distribute Ordnance Survey datasets and licenses. Sarah is the relationship manager with both Innogistic and Ordnance Survey. Previous to this Sarah spent two years on secondment to Natural England as a GIS advisor. Sarah has extensive consulting experience for clients including Environment Agency, British Waterways as well as for international clients including the Romanian, Australian and American governments. Sarah read Geography at Plymouth University and gained her Master in Geographic information systems at the University of New South Wales, Australia. In the past Sarah has worked as volunteer at the USGS Hawaiian Volcanoes Observatory and is currently a committee member for the AGI Systems and Suppliers Special Interest Group.

John Richardson is the Marketing Manager for Bristol based Innogistic, the software developers of the new Maps@ solution. As well as his current role, John has over 10 years experience in the Geospatial Information Industry. He spent over seven years with Ordnance Survey, the UK's national Mapping Agency, with whom he held several Map and Geo-data marketing management roles. John has had many articles published on the use of Geospatial Technology within diverse market sectors such as the Emergency Services, Utilites, Local and National Government and private sector applications. John also has a broad marketing experience from past positions held within other industries including, Leisure, Radio-Communications and Home Improvements Markets. He studied for his degree in Marketing at Southampton Solent University as well as obtaining his CIM Post-Grad Diploma in Marketing from the same institution.

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