Preserving a digital heritage

While printed map collections in the British Isles are among the world's best preserved, Ron Clark explains how the latest cloud-based technology is now being exploited to make its digital map datasets fit for the future

By law, a copy of every UK print publication must be given to the British Library by its publishers, and to five other major libraries that request it. This system is called legal deposit and has been a part of English law since 1662. The six UK Legal Deposit Libraries are: the British Library; the National Library of Scotland; the National Library of Wales; the Bodleian Libraries of the University of Oxford; the University Library, Cambridge; and the Library of Trinity College, Dublin.

Since 2013, legal deposit has also covered material published digitally and online, so that the Legal Deposit Libraries (LDLs) can provide a national archive of the UK's non-print published material, such as websites, blogs, e-books, e-journals and CD-ROMs. Each LDL has a substantial collection which, with the passing into law of the 2013 Regulations, has continued to grow. Access to digital and online content collected through legal deposit is restricted and only provided only onsite in the reading rooms of the legal deposit libraries.1

Improved access

Improved access to the nation's digital map archives can be attributed to subsequent development of the LDL's Geospatial Data Application and Services (GDAS) system. The result of a successful collaboration with thinkWhere, based in Stirling, Scotland, the system now stores large scale Ordnance Survey GB mapping, including its MasterMap dataset, dating back to 1998, plus large scale Ordnance Survey Northern Ireland data dating back to 2004.

To achieve this end, an extensive programme of data processing was undertaken and an online map viewer developed that allows library visitors to view, search, query and print the available mapping. thinkWhere has built the system to comply with copyright restrictions for printing, allowing users one A3 copy and no reproduction from the split-screen view (which allows library visitors to compare and contrast a dataset over different epochs). As well as making the map viewer accessible in each of the Legal Deposit Library reading rooms, thinkWhere also developed an administration portal for use by library staff. This included a full metadata management portal using the bibliographic library metadata format, MARC XML, as well as a suite of tools to access map viewer usage statistics.

Enhancing GDAS

Under legal deposit legislation changes, the LDLs began looking to implement a process that would allow for other publishers of digital maps to deposit their material. In 2016, they commissioned thinkWhere to redevelop and enhance the GDAS system using its latest theMapCloud platform … one that harnesses opportunities presented by modern cloud and Open Source-based GIS technologies. This fully-managed platform and spatial data infrastructure offers Platform as a Service (PaaS), Data as a Service (DaaS) and Software as a Service (SaaS) capabilities.

Architected with industry-leading open-source technologies and frameworks, theMapCloud offers a RESTful standards-compliant API

written in Python using a lightweight Flask framework. Database and GIS technologies sitting beneath the API include Open Source technologies such as PostgreSQL & PostGIS, GeoServer and MapProxy, all hosted on the company's fully managed Amazon Web Services infrastructure. This setup offers the Legal Deposit Libraries a flexible, reliable, scalable and highly-performant solution. Based on technical advances offered by this platform, the GDAS system front-end was redeveloped around user-centred design principles using AngularJS and Bootstrap. Additional functional capabilities were also provided, the most-notable of which is the ability to consume and display datasets from global projections. This enables the archiving of data from outside the geographic extent of the UK. Development began in September 2016 using an Agile Scrum approach in collaboration with library representatives. Interactive customer feedback from the outset saw new releases issued every fortnight until the new GDAS system went 'live' on schedule eight months later.

On time and budget

Legal Deposit Libraries Project Manager Mike Euesden said, "thinkWhere has delivered high quality products on time and budget. Delivery is underpinned by robust project management, and an agile approach to development and excellent communication". The company, too, is well pleased at the result. "This project is one of the most comprehensive our company has undertaken and it will secure the position of digital map data in understanding our nation's heritage," commented thinkWhere account manager Alison Moon.
For Alan Moore, Chief Executive at thinkWhere, the project yielded significant benefits for the company. "Our move to Agile software development and significant investment in theMapCloud paid early dividends on this project and it's pleasing to see our contribution to the vital task of Non-Print Legal Deposit successfully realised."
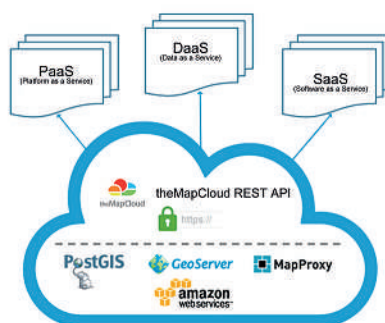Moore also sees the technology being exploited further. "The underlying components can be enhanced, upgraded and improved with no impact to customer endpoints or applications" He cites the company near-completion of a major software development project for the Humanitarian OpenStreetMap Team (HOT). Using theMapCloud platform, the new version of HOT's Tasking Manager will significantly enhance the experience of mappers as well as the efficiency and quality of project management and validation of map data being captured for disaster response, contingency planning and relief campaigns.
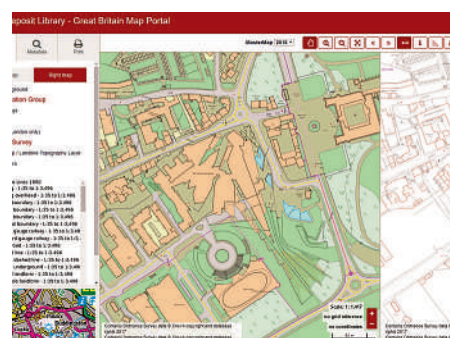

The GDAS system stores almost two decades of large scale digital mapping published by Ordnance Survey GB, including its MasterMap dataset

theMapCloud employs industry-leading Open Source technologies and frameworks

Fit for the future

Its inherent system scalability means theMapCloud has the capacity to store huge volumes of data for the LDLs (more than five terabytes relating to OS products alone). The GeoInformation Group, one of the UK's leading publishers of innovative geospatial data products, including UKMap and UKBuildings, is the first new publisher to be loaded to the new GDAS system and other providers are in negotiation with the libraries to do likewise.
In choosing to migrate to theMapCloud, the LDLs are able to take advantage of the flexibility and scalability of true cloud computing to help realise their future ambitions. The platform is also able to deliver security benefits, reduced cost and improved stability for the resource, ensuring the long-term security and preservation of the digital map datasets for the future.

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Reference
1. https://www.legaldeposit.org. uk/electronic/index.html

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The split-screen view gives library visitors the opportunity to compare and contrast a dataset across different epochs

Datasets from The GeoInformation Group are the first from new publishers to be loaded to the new GDAS system

'TheMapCloud offers LDLs a resource that is easy to deploy to reading rooms and is open source for our future development needs. Whatever datasets we receive in future, the system will be able to read and process these, as well as have the capacity to grow storage flexibly, as required. theMapCloud and the project in general underpin a significant element of the future for LDL map collections. The implementation of Non-Print Legal Deposit will allow the LDLs to provide access to a growing body of map content published in the UK. The excitement of the project will only continue in coming years as we reach out to more customers and grow the scope of the resource, a significant undertaking that the scalability of theMapCloud makes possible'." **Phil Hatfield, Lead Curator, Digital Mapping, at the British Library**