GEOSPATIAL MGT SYSTEM FOR THE OSI

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Executive Summary:

OSi has always taken pride in the quality and consistency of the information it provides. In the past, this was extremely difficult to guarantee and involved a great deal of manual processing and checking. For the GMS implementation, OSi adopted 1SMS, a product suite that manages the end to end process of planning, maintaining and publishing spatial data.

1SMS introduces the innovative use of rules-based automation, to ensure that the data in PRIME2 is safe, accurate and always in a validated, publishable state. It enables OSi's staff to focus their time where it is most valuable by removing large amounts of routine, administrative tasks.

Surveyors in the field now receive their projects, with all required data and related imagery, direct to their tablet or laptop. This previously manual process is now completely automated. As the survey work progresses, the system runs over 300 rules on the surveyor's device to ensure their data complies with data model requirements. Once the updated information is transmitted back to OSi's offices, a further 400 automatic rules are run to ensure compliance before any new data is accepted into the core database.

Expert intervention is only required to resolve flagged exceptions in the data. If the rules identify any non-conformances in the data, the system automatically dispatches a remedial job to the surveyor for completion prior to acceptance of the data. The change driven, automated validation is executed on every feature change, ensuring PRIME2 is maintained to the highest quality. Colin Bray, OSI CEO, notes that, "activities that would typically have taken weeks in the past, can now be done in days."

A mixture of automated and assisted manual conflict management techniques are inherent within the 1SMS products and thereby enabling OSi to run several projects concurrently in the same area. The system either automatically resolves any conflicts that occur, or dispatches a conflict resolution job to a specialist user, thereby ensuring that the quality and integrity of the core data is maintained.

Since Go Live 10,379 separate jobs have been completed and merged back into the Live database, this is a significant body of work.

Business Challenge:

The common method of maintaining map data involves creating and updating tiles holding digital cartographic representations of traditional paper maps. Managing data within this model is expensive and time consuming. Making a single change, for example changing a crossroads to a roundabout, involves locking the tile or tiles that are affected, extracting the relevant data, conducting the survey, updating the data, validating it and then re-integrating the new data into the core database. Every stage of the process typically involves a high level of manual work. The OSi team recognised that meeting increased demand for ever more timely information would require a fresh approach.

The organisation realised that the solution was to move from updating map sheets (albeit in digital form) to maintaining a real world, object-oriented data model; a digital representation of the landscape made up of over 50 million individual objects, each with its own Globally Unique Identifier.

PRIME2 represents a fundamental shift for OSi's customers, too. Not only can OSi keep their data more current and do this cost-effectively, it can provide this information to users in a standards-compliant, "agnostic" format that can drive automation in business systems.

As a result, a utility company planning and costing a new underground cable or pipeline, can gain a much deeper understanding of the target environment: which surfaces are hard or soft, the form and function of nearby buildings, etc.

Richer information enables more accurate costing and more effective planning. For government departments, this new, national spatial platform provides a standardised and authoritative way for referencing all information that has a location. In turn, this supports more effective decision-making for government.

As Colin observes, "No longer is OSi information just a back-drop map, it is actually a fundamental part of our users' business solutions."

Project Objectives:

- Improved efficiency in the data capture process.
- Improve currency of the data.
- Enabling better decision-making for customers through delivering richer, more intelligent data.

Future-proofing the organization enabling the use of the greater levels of richness to exploit automatic product generation.

Solution:

Our spatial data management environment provides a suite of products to efficiently and consistently plan, maintain and publish your data, whilst also automating your production workflows. The 1Spatial Management Suite enables you to:

- Rapidly respond to real-world change ensuring your spatial data is always current, accurate and trusted.
- Increase productivity and reduce operational costs by adopting automated spatial data management and quality assurance workflows.
- Meet continually changing market needs with scalable and flexible on-demand product generation.

The 1Spatial Management Suite is built from 1Spatial's high-performance products and is underpinned by enterprise database and Service Oriented Architecture technology from industry leaders such as Oracle and Snowflake Software.
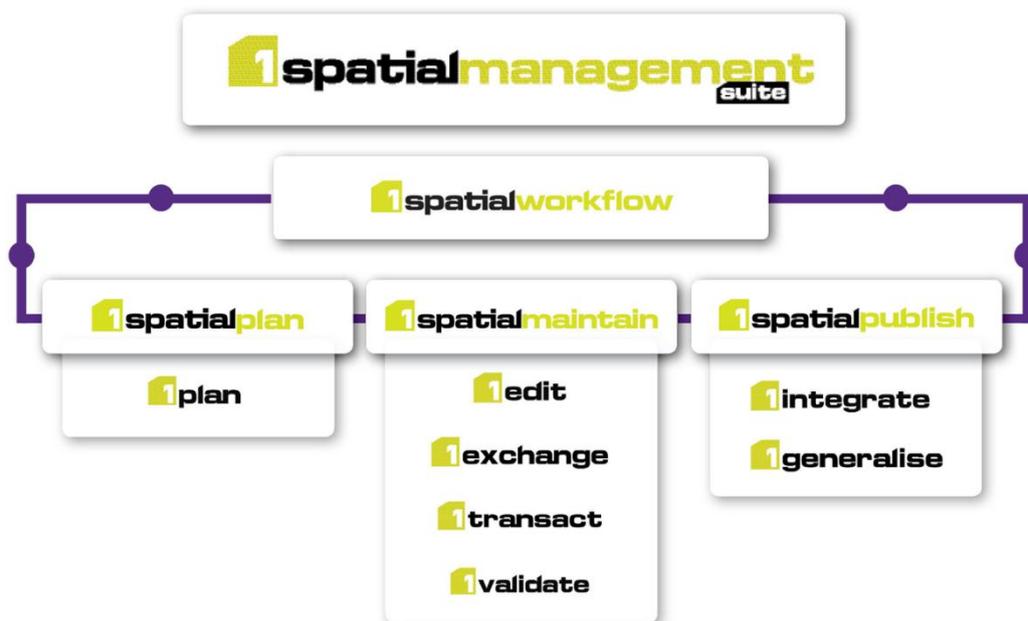
1SMS utilises Oracle's Workspace Manager to enable the system to use long transactions in which to make updates. This means that changes can be made in isolation, and only merged to the Live database once all the validation rules have been satisfied. 1Transact integrates seamlessly with Oracle Workspace Manager and enables transactions to be managed automatically via 1Workflow.

1Workflow also utilises Oracle's Business Process Manager, providing BPEL workflows which determine the lifecycle of each job that goes through the system.

1Exchange is under pinned by Snowflake Software's GO Loader and GO Publisher and also utilises Safe Software's FME. GO Loader and GO Publisher create GML extracts and write changes back to the workspace, whilst FME can be used to transform the GML to any format for consumption by multiple clients. This functionality is used with the GMS to facilitate the photogrammetry flowline, where Bentley Map is used by Ordnance Survey Ireland.

1Spatial's 1Validate is the cornerstone of the system, automatically validating all changes made within the system before any changes are allowed to be merged into the Live database. The rules developed and executed within 1Validate are transferrable to 1Edit so they can be used in the field. This ensures the data in the context of the job is valid before it leaves the surveyor, reducing the risk of delays in merging the changes to the Live database. The server side validation ensures the changes are valid in the context of other changes and the features outside the job extent.

The project to implement the GMS required a joint team, with resources from both 1Spatial and Ordnance Survey. The collaboration experienced for this implementation was exceptional. Co-located team members assisted massively, as well as ensuring Ordnance Survey Ireland had early access to the software to help build knowledge and understanding from day one.

The full implementation took 11 months, which included training and roll out. Ordnance Survey Ireland took the decision to nominate their Sligo regional office as the early adopters of the system. This exercise was extremely valuable as it meant that one regional office were able to get up to speed with the system and go through the full roll out process on a smaller scale, and after a period of smooth running became the flagship for other regional offices to mimic.

All the case study information can be found at http://1spatial.com/customer/ordnance-survey-ireland and a video on 1Spatial's Management Suite can be found at http://1spatial.com/products-services/1spatial-management-suite.

Target Audience:

The output of this project impacts the entire Irish Spatial Data community. Anyone that has previously used Ordnance Survey Ireland's data for back drop mapping can now gain so much more intelligent richness from the data.

Benefits/Results:

Ordnance Survey Ireland are now enjoying the following benefits:

- Time to extraction of jobs to surveyors reduced from a 3-5 day manual process to a completely automatic process taking 3-9 minutes.
- Automated validation, enabling Ordnance Survey Ireland to repurpose the team required to previously manually check the data.
- Time to submit changed features reduced from a 2-3 day manual process to a completely automated process taking on average 5 minutes.
- Known quality baseline that can be continuously monitored.
- Strong baseline to enable future exploitation of richness, in terms of automatic product generation.

Final Considerations:

The GMS project innovates on many levels:

- The technology used to automatically validate data and maintain the integrity of the live database.
- The use of mainstream IT technologies alongside specialist GIS technology.
- The team collaboration.
- The roll out approach.

The implementation of the GMS (and the PRIME2 Data Re-engineering before it) are a perfect example of Best Practice in delivering significant organisation, technology and business process change. It required significant collaboration, trust and commitment from all sides but should be the bench mark for how the traditional 'Supplier & Customer' relationship can be developed to achieve smoother implementations.