Delivering reliable digital data and information management for Environment Agency's physical flood and coastal defence assets

"Data compliance and trusting data is essential in the digital world. As we begin to connect more, we need to have trust in asset data and independent assurance is a new approach."

Karen Alford, Flood and Coastal Risk Manager - Digital Data and Information, Environment Agency

Industry	Government	
Customer	Environment Agency	
Challenge	Asset data supplied as geoCOBie files needed assuring against contractually defined standards at the point of delivery.	
Solution	Automated process for extracting, assuring, and storing geoCOBie files, using FME Server for data extraction, 1Integrate for data assurance and Azure SQL Database for data storage.	

Key Benefits:

- Improving asset information management working practices for assuring, accepting, and storing asset data.
- Improving the quality of asset data held by the Environment Agency.
- Reducing the time taken to process geoCOBie data from suppliers.
- Reducing the time taken for asset data to reach Environment Agency operational and maintenance systems.
- Improving asset data accessibility, interoperability, and reusability.
- Reducing re-survey costs.
- Improving resource efficiencies through the automation of previously manual information selection and upload processes.
- Providing information audit trails to help meet statutory requirements.

Background

The Environment Agency is a non-departmental public body sponsored by the Department for Environment, Food and Rural Affairs (Defra). Responsible for protection and enhancement of the environment across England, it employs around 10,600 staff, organised into four directorates. Of these, Flood and Coastal Risk Management (FCRM) deals with approximately half the Agency's annual expenditure to build, maintain and operate flood defences, and provide effective flood warnings to communities.

Data about its extensive flood and coastal defence assets, which are an essential part of the national infrastructure, is as important as the physical assets themselves. Robust information management is therefore required to ensure that the Agency's asset data is findable, accessible, interoperable, re-usable and fit for purpose.

Government Drivers

In 2016 the Environment Agency was one of the six departments mandated by government to improve productivity in construction by delivering Building Information Modelling (BIM) Assurance with the British Standard BS/PAS 1192. The Environment Agency is one of the UK central government early adopters for digital asset data and information management and has been pivotal in driving efficiency and productivity in the construction industry.

Now internationally adopted as ISO 19650, the BIM mandate recognises that public construction projects involve the procurement of two types of assets, the physical and the digital. By setting out the standards for the effective information management of digital asset data – from concept through to operation – the government can be sure it is fit for purpose and can be easily shared.

Karen Alford from the Environment Agency explains:

"The Construction Playbook and Transforming Infrastructure Performance: Roadmap to 2030, including a new information management mandate, is pushing us forward, along with lots of other drivers, such as national digital twins, data for the public good and the national data strategy. It's all part of this data journey that we are on."

"ISO 19650 is a standard in how data and information needs to be managed in collaborative frameworks and collaborative contracts. It is focused on defining, checking, and making best use of data, and being able to automate that. So, it's a specification that tells our suppliers how we need our data to be managed, the standards they should be applying, and the skills they should be deploying."

Challenge

"We have to ensure that our data is fit for all purposes but in the past, we never thought about how we could be confident that the data we commissioned was going to be right: we might have included specific data in a contract, but we'd never stipulated the standards and requirements to be achieved."

The Environment Agency has a significant capital program and vast assets. With most of its asset management data commissioned from third parties, it needed to implement point-of-entry data quality assurance into its procurement process to ensure information coming from different systems was consistent and easily understood.

Asset data assurance is typically performed manually on an ad-hoc basis and is time-consuming, with long data lead times impacting on planning and budgeting. Due to time-sensitive pressures, sometimes the bare minimum asset information is added simply to get the asset working which creates a legacy data quality problem, hinders digital transformation, reduces both the ability to report on and manipulate information, and to visualise and interrogate it using mapping.

Solution

"1Spatial's 1Integrate technology and Safe Software's FME Server technology provides robust asset data and information assurance capabilities, to enable our strategic objectives and further digital transformation. The automated geoCOBie data assurance processes for collecting, collating, analysing, and sharing data appropriately on asset performance provides us with the insight we need to improve productivity and deliver benefits to society."

Environment Agency staff has a set of classified asset data and information requirements. These are defined in the information delivery plan. This tool aids the procurement of asset data and information. When a tender is issued delivery partners respond with a BIM execution plan. This means they agree or make amendments to ensure that the Agency has clear visibility of what's going to be delivered and when. The information delivery plan is reviewed and updated at every gateway to build a data and information specification for all contracts. The classification and data requirement standards are held in an online library Asset Categories (data.gov.uk).

Work in the Environment Agency to develop its asset Information Management Platform (IMP) has continued. The "Datastore, Rules and Visualisation" (DRV) service is a key component of the Environment Agency's asset IMP. 1Spatial were appointed to be Environment Agency's delivery partner for the DRV service.

To give confidence in the data provided by its suppliers, the Environment Agency use 1Integrate and FME Server to deliver automated asset data assurance (verification). The integrated DRV service assures geoCOBie data against different asset information requirements, for example, employer's information requirements, information delivery plan, and business, technical and spatial rules. A hosted FME Server looks for new geoCOBie files in an Excel format, that have been uploaded by suppliers to the Environment Agency Common Data Environment (CDE), Asite. New geoCOBie files are parsed and loaded into a staging area in preparation for assurance using FME Server.

The 1Integrate central rules library is made up of 170 business and technical rules that checks the geoCOBie data. If the geoCOBie data passes the required rules, a verification approval report is generated. If the data fails to meet any of the rules, a verification failure report is generated, advising the supplier of the issues found. This report can be used by the supplier to correct the issues before re-submitted files back to the DRV for verification. Accepted geoCOBie data whose workflow status indicates that it is 'For Publication', will be imported into the DRV master repository, a Microsoft Azure SQL Database, ready for visualisation and re-use across the Environment Agency processes and associated business systems.

Components of the Datastore Rules and Visualisation service include 1Integrate, FME Server, a structured data store, and visualisation technologies.

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