Better Communication

Keeping everybody in the loop in rail engineering used to be much easier. But as stakeholders demand better technology, greater assurance and more integrated systems, the process of sharing information and ensuring traceability can become very tedious and prevent skilled engineers and valuable resources from being applied to tasks that use their full potential.

Even before thinking about external stakeholders and the supply chain, engineering for a rail network involves the input of multiple functions and capabilities. Design, development, manufacturing, quality, compliance and more, will have an input into the process.

All of these disciplines have a unique and highly valued set of skills, but as a result of their different perspectives, it can be challenging for them to keep one another's needs in mind.

Engineering works better when it's more joined up. It comes down to effectively sharing information between teams and with suppliers, but as the demands on the network become more complex, engineering will have to look at different ways of making this practically achievable.

What this would mean is moving past ad hoc communication between teams and with suppliers – passing emails, documents and spreadsheets around and outside the organisation – and towards a way of handling shared information with respect for the needs of different functions and suppliers inherently built in.

Such an approach would need project and task information to be specified in a standardised format that is designed to meet the needs of everyone expected to use that information.

It would also need to be responsive to change, and enable seamless propagation of any updates to project goals, specifications or standards across all engineering functions and down the supply chain, while keeping everyone on the same page by guarding against errors, miscommunication and poor traceability.

When you put it that way, you wonder if the best way to think about sharing information is 'communication' at all. Communication implies two separate stores of knowledge interacting, when in fact, all engineering functions, and suppliers with them, could be working from a single source of truth. A big picture that is being constantly maintained, adapted and used by everyone involved, which requires them to think about the needs of others by virtue of how the information is structured.

By setting things up this way, it is possible to significantly diminish the burden on engineers to spend time communicating effectively and traceably. At the same time, it can be ensured that everyone's information is accurate, up-to-date, secure, traceable and as complete as they need it to be.

The Melbourne Metro: Collaboration in the Cloud

Still ongoing, the Metro Tunnel project in Melbourne is one of the most complex civil engineering projects in Australia's history. Over eight years and costing around £6 billion, the plan is to construct twin 9km metro tunnels under central Melbourne, dramatically increasing peak capacity on many of the city's suburban rail lines. The demanding project requires coordinating around 7,000 construction workers and other professionals, ongoing collaboration with a wide variety of independent contractors, and constant communication with numerous stakeholders.

Using traditional requirements management methods with such a diverse array of independent engineering contributors would have led to siloed data and a lack of common standards, which could have taken weeks to process into a form which would give a sense of the actual state of work, by which time it would be out of date.

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Instead, Rail Projects Victoria (RPV) adopted a software package that enabled them to manage their requirements collaboratively in the cloud. This tool enabled all suppliers and other stakeholders in the project to work from the same, single source of truth, while still preserving their data privacy and intellectual property. When the requirements change, the change can be processed through a project-wide workflow that highlights the interdependencies between requirements across all parties, and when the request is approved, it can be immediately propagated across all of the suppliers, with the impact on their subsystems clear and unambiguous.

By introducing standardised requirements management and a common platform, RPV has significantly improved its ability to handle change in a complex supply chain, and mitigate the associated expense, risk and delays.

Read more about this case at https://www.ibm.com/case-studies/rail-projects-victoria-watson-cloud-engineering

Communicating Value

Getting suppliers to understand requirements can be a time-consuming and costly negotiation. Every organisation can find itself dealing with suppliers who will find any way they can to misinterpret instructions. According to the Deloitte Global Chief Procurement Officer Survey 2018, two-thirds of procurement leaders identify generating win-win situations and trust as a key approach to supplier collaborations. Standardising requirements across the supply chain, and enabling everyone involved to work from a single source of truth about projects, can solve many of the problems associated with relying on external resources to deliver a better rail network.

Sharing information with suppliers in this way can help rail infrastructure owners maximise the lifetime value of their assets, not just by ensuring that work is being done to an acceptable standard of quality, but also by guarding against scope-creep and protecting tight specification and change control. A single source of truth ensures suppliers are not just delivering no less than expectations, but also no more than the network can afford.

This information sheet is an excerpt from SyntheSys Technologies White Paper about Engineering a Better Railway for Northern Ireland. Read the full White Paper [here].

About SyntheSys

SyntheSys provides defence systems, training, systems and software engineering and technical management services over a spectrum of different industry sectors. Along with distinct support and consultancy services, our innovative product range makes us first choice provider for both large and small organisations. Established in 1988, the company focus is on fusing technical expertise with intuitive software applications to solve common industry challenges.

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