Communicating Change to a Vast Network of Stakeholders

Getting suppliers to understand your needs can be a time-consuming and costly negotiation. Every business finds themselves dealing with suppliers who will find any way they can to misinterpret your instructions, even when your requirements remain relatively static.

Keeping everybody in the loop in rail engineering used to be much easier. But as stakeholders demand a more dynamic engineering process to reflect better technology, greater assurance and more integrated systems, the process of sharing information with your own supply chain and ensuring traceability becomes much more error-prone and demanding. When project managers and engineers have to devote too much of their attention to the often tedious work of contract management, they have less time to focus on objectives like safety, efficiency, reliability and productivity. Engineering works better when it's more joined up, precisely because it allows change to be handled with minimal interruption to your team doing what they do best.

What this would mean is moving past ad hoc communication with suppliers – passing emails, documents and spreadsheets – and towards a way of handling shared information which retains a single source of truth even between partner companies. Such an approach would need product 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 down your supply chain, while keeping everyone on the same page by guarding against errors, miscommunication and poor traceability.

Even systems engineering standards and associated on-premise tools have historically struggled to streamline the process of communicating with suppliers. But with the advent of collaborative solutions like IBM® Engineering Lifecycle Management, businesses have an opportunity to introduce a single source of truth across the supply chain.

Solutions like this provide web browser access to the full development cycle from requirements through to verification and validation. Because of strong information security protocols, with role-based access, which provide the commercial protections needed when collaborating on a sensitive development project, these tools greatly enhance the ability to view and share data not just among the internal development team, but also with third parties in the supply chain.

Furthermore, by enabling compatibility with the industry standard Requirements Interchange Format (ReqIF), these tools enable systems engineering to move beyond bespoke point-to-point integrations between applications, and engage the supply chain in development even where tools and practices differ and where sever-client access to data has historically presented a problem for collaboration.

IBM Watson IoT™ Engineering Requirements Management DOORS® Family and IBM® Engineering Requirements Management DOORS® Next allow the export of requirements in a cross-platform XML format, which can then be imported into a wide variety of ReqIF capable tools across the supply chain, while remaining locked within the host database and closed to editing. Once the supplier has finished deriving and refining their level of requirements from the parent databases a ReqIF file is returned to the parent and synchronised. By setting things up this way, you can significantly diminish the burden on engineers to spend time communicating effectively and traceably. At the same time, you can make sure 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.

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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 you a sense of the actual state of work, by which time it would be out of date. Instead, Rail Projects Victoria (RPV) adopted IBM® DOORS® Next 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, IBM® DOORS® Next allows that to be processed through a project-wide workflow that highlights the interdependencies between requirements across all parties, and when the request is approved, it is 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.

Bringing in the Whole Team

Even before you think about external stakeholders and your own supply chain, supplying to the rail industry involves the input of multiple functions and capabilities. Product, design, development, manufacturing, quality, compliance and more will have an input into your process, and will all need to be kept on the same page through change. 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.

A single source of truth matters in your own process, too: not just in terms of how the part of the product any individual is concerned with fits into the whole, but also in terms of understanding the needs, expectations and process of other functions can have significant advantages.

Joined-up development undoubtedly needs the right tools to support it, but those tools are only as valuable as the skills of the people operating them, and the processes that need to be put in place. This is what makes the difference between teams that grumble about an additional layer of compliance and teams that feel enabled to do their jobs better by the tools provided to support them.

Being ready to adapt to change is more than a cast of mind: it requires a specific set of skills and tools. Embedding those throughout your organisation can make your development process considerably more dynamic and effective, while enabling project managers to focus on what really matters.

This information sheet is an excerpt from SyntheSys Technologies White Paper about Embracing Change in Rail Supply. 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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