BAE SYSTEMS
INSPIRED WORK

Case Study
Digital Railway

Summary

The GB Rail Network is facing the challenges of meeting increasing demand (Passenger journeys up 40%, Freight carried up 70% between 1995-2010) and addressing the ongoing pressures to reduce costs. The railway industry must plan to respond now.. Digital Railway (DR) is a proposal for a national plan that delivers the pace, co-ordination, and whole industry approach needed to unlock the transformational benefits of a digital network. BAE Systems lead the client side team in defining the DR 2029 Target Operating Model which means that for the first time in the rail industry an 'Industry Architecture' framework has been developed providing a comprehensive and top down model of the railway future state.

Approach - A High Performing Team

The development of the architecture required an innovative approach to team development. At the outset a mixed team was established, consisting of enterprise architects & system engineers, change management consultants plus subject matter experts covering areas such as Human Factors, Maintenance, Safety and Security.

A 'High Performing Team' methodology was adopted and this approach encouraged a culture of openness, collaboration and innovation. These behaviours were central to the successful delivery of this project.

Delivery

As Is Capability Assessment

Through extensive engagement with senior stakeholders across the Rail Industry the team were able to both identify and then prioritise those capabilities that are critical to the delivery of the DR strategic outcomes. Through this engagement the team were also able to provide a detailed assessment of capability maturity, undertake a gap analysis of required 2029 target state maturity and provide an assessment of current 'in flight' railway projects that would contribute to meeting those targets.

Target State Definition

The Target State team undertook a series of six 4 week 'design sprints' which each focussed on a specific objective, allowing for delivery in an accelerated time frame. Following the High Performing team method, the 'sprints' comprised a systematic approach, with each delivering a 'System of Systems' design and associated set of requirements. These were then reviewed by the RAM, Safety, Security and Human Factors SMEs to ensure coherence and then the architecture was subsequently updated.

Change Architecture

Using a Change Architecture approach the team defined a set of Railway States to enable the delivery of a phased set of capabilities to achieve the 2029 target state. This approach will allow the 70 plus stakeholder organisations that together deliver the railway network, to select the capabilities they wish to adopt, to understand their impact on wider interoperability and assess impact of new technologies as they emerge. As the architecture is industry-wide, i.e. beyond the scope of the DR Programme, it can be used to assess and manage change across the entire industry without restricting innovation or allowing duplication.

Strategic Impact & Next Steps

This innovative approach has resulted in the rail ecosystem being captured in a single, comprehensive and structured industry architecture for the first time in UK railway history. It enables the understanding, not only of the technical aspects of a programme of work, but also the impacts on people & processes, information, safety, security, infrastructure and performance. This approach will fundamentally change the way the rail industry develops and delivers capability into the future. Indeed it is already being used to assess the set of initial in-flight DR programmes, which are seeking to replace existing command, control and signalling infrastructure to enable increased rail capacity

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