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DIGITAL TRANSFORMATION: FROM SMARTER PLANNING TO BETTER PERFORMANCE

HOW THE DIGITAL FUTURE IS ACTUALLY A DIGITAL PRESENT

for a host of rail and metro
operators around the world.

THE INSIDE STORY on how
the startup Railnova is helping
rail companies transform
their fleet management and
maintenance.

THE NINE KEY WORKSTREAMS

identified by the private sector
to enhance Britain's Digital
Railway Programme.

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Contents

- 4 How the digital future is actually a digital present for a host of rail and metro operators around the world.
- 7 Project focus: Digital transformation on the construction of the MRT Sungai Buloh to Putrajaya (SSP) Line, Klang Valley.
- 9 The inside story on how the startup Railnova is helping rail companies transform their fleet management and maintenance.
- 13 Siemens' new platform to showcase digital infrastructure opportunities for US transit.
- 14 The nine key workstreams identified by the private sector to enhance Britain's Digital Railway Programme.
- 17 The Last Word with... Michael Deittrick, global chief technology officer at DXC Technology.



Dear colleague,

Many thanks for downloading '**Digital transformation: From smarter planning to better performance**' the 28th industry guide from the team at SmartRail World.

Digital transformation, defined here as 'the use of technology to radically improve performance or reach of enterprises' – is like Internet of Things and Big Data one of key buzzwords heard within rail and metro these past years.

Our industry, like many others are using digital developments like analytics, mobility and smart devices to improve their processes, operations and passenger relations. This guide aims to not just comment on these developments but show how it is already happening in Malaysia, China, Dubai, the UK and the USA among others.

In the conversations around this guide, we found that rail operators face pressure to begin or speed up their transformation, and that the processes need a buy-in from across the organisation that is driven from the top-down to truly succeed. A successful transformation doesn't come from a new organization but from reshaping and improving what currently exists. As one of our experts in our guide states "put simply, they (the operators) need to do more with the same people, same money and same assets."

This industry guide would not have been possible without its sponsor **Bentley Systems**. A proven and trusted partner to the world's railway community, Bentley's software and services support the BIM standards and workflows that streamline design and collaboration, ensure effective project delivery, and enable improved performance during operations. We are grateful to members of the Bentley team and some of the decision makers at global projects its solutions are deployed on, for the information and insight shared with SmartRail World for this guide.

Thanks also to **LILEE Systems**, **Alcatel-Lucent Enterprise**, the **MTR Academy** and **Istanbul Rail Tech** for their support and all those who gave their time to myself and the team here.

If you would like to contribute to future features and publications, please e-mail Luke@SmartRailWorld.com.

Regards and thanks,



Luke Upton
SmartRail World, Editor.
www.smartrailworld.com

Project focus: Digital transformation on the construction of the MRT Sungai Buloh to Putrajaya (SSP) Line, Klang Valley

Kuala Lumpur, like many cities in Asia, is experiencing a significant growth in population. The city itself has a population of 1.8 million which is set to climb to 2.2 million by 2020.

Whilst Klang Valley, the greater metropolitan region, has over 6m inhabitants a rising population, rapid urbanization and challenges in city planning have led to transport problems – most clearly visible in the city's infamous traffic jams. In order to keep the city and the region moving, the government has responded with the Klang Valley Mass Rapid Transit (KVMRT) System, one of the most ambitious transport mega projects ever undertaken in Asia. Approved by the Malaysian Government in December 2010 and launched by Prime Minister Datuk Seri Najib Tun Razak on 8 July 2011, it will help ease traffic congestion and increase the public transport modal share from 18 % in 2009 to 40 % in 2020.

The system consists of three new rail lines, each of which will be integrated to current rail systems in Kuala Lumpur. The second of the three lines is the MRT Sungai Buloh to Putrajaya (SSP) Line, which will include a total of 37 stations, 11 of which will be constructed on the 13.5-kilometer underground section, and will serve a population of around 2 million people along its 52.2-kilometer corridor.

Malaysia's Mass Rapid Transit Corporation (MRTC) as the transit system's owner and developer, has a vision of technical excellence for this project and is one of the first in Asia leveraging cloud-based collaboration on a common data environment. In partnership with Microsoft's Global ISV and Bentley Systems, MRTC aims to complete the project on-time and within budget, benefitting from a projected 35% productivity increase in the design, construction and operation of this infrastructure through seamless information sharing and collaboration powered by Microsoft Azure.



Azure enabled MRTC to increase precision of construction, reduce instances of design rework and to improve safety standards by enabling seamless synchronization and information exchange between external vendors. It has enabled all project disciplines to work dynamically using a model for coordinated design, despite the participation of numerous external vendors and decentralized information on this complex project.

The use of the federated platform has enabled over 1,500 users on the common data environment (CDE) to collaborate on more than 45,000 documents, corresponding to 750GB of design files. MRTC was able to improve efficiency of design coordination and achieve a significant reduction of design clashes by the Final Design stage. This repository also provided the basis for efficient ongoing asset management for the optimal lifecycle of this critical infrastructure.

MRTC faced several challenges with the construction of the KVMRT SSP line. One of the key issues MRTC faced in the previous SBK line project was too many site changes during construction, resulting from design discrepancies arising from either design changes or site constraints. In addition, MRTC has to manage 30% more consultants involved in the SSP line, all of whom would have to have direct access to the common database in order to continuously update design information, eliminating outdated and misinterpreted information.

Project focus: Digital transformation on the construction of the MRT Sungai Buloh to Putrajaya (SSP) Line, Klang Valley. *[cont]*

Poh Seng Tiok, director of planning and design with MRT Corporation said: "One of the key challenges faced with any mega civil construction project like ours is ensuring seamless information exchange, and real-time collaboration among stakeholders, regardless of the platforms they are using. The probability for error is high if information is not managed on a common data environment, especially in a highly collaborative project like ours. These types of errors could lead to construction delays and increased costs due to change orders and rework to rectify issues."

As part of the CDE, virtual design review (VDR) sessions brought all disciplines together on a fortnightly basis to review, coordinate, and resolve clashes in their work. The increased trust and acceptance that information being shared was both current and fit for purpose reduced rework for all involved, and enabled MRT Corporation to improve collaboration by 35 percent.

MRT Corporation used ProjectWise, Bentley's project information management and collaboration software, as the common platform to improve collaboration and streamline the design process among numerous design disciplines, and AssetWise, Bentley's asset performance software, to support asset lifecycle information management.

Both applications leverage Microsoft's Azure cloud services, allowing all disciplines to work dynamically using a federated model for

coordinated design, and enabling the integration of design and asset information with operation and maintenance systems to ensure optimal asset performance throughout the project lifecycle.

Poh Seng Tiok tells us more; "Bentley's connected data environment, bridging ProjectWise and AssetWise, provides a seamless solution for MRT Corporation in our BIM workflow and supports the sharing of information through the entire project lifecycle. Operating the Bentley CDE platform in the Microsoft Azure cloud enables our geographically dispersed project teams to collaborate as if they were all centrally located."

These undertakings in the Klang Valley, are a further example of digital transformation, and the benefits that can be delivered to large-scale, personnel- and capital- intensive mega projects. Kaushik Chakraborty, VP, Regional Executive, Asia South, Bentley System concludes: "The KVMRT project is an example of how the world's infrastructure projects are undergoing digital transformation through the power of cloud services to improve project delivery and asset performance."

Together with Microsoft, we are pleased to see organizations tapping the power of the cloud to realize the potential of real-time business insights and collaboration to deliver greater efficiency in a highly complex industry."

"Operating the Bentley CDE platform in the Microsoft Azure cloud enables our geographically dispersed project teams to collaborate as if they were all centrally located."

