

Bentley Case Study

*Malaysia's Mass Rapid Transit Corporation
taps the power of Microsoft Azure*





With 9 billion people expected on the planet by 2030, advancements in infrastructure must be developed and implemented globally, economically, and more rapidly. Malaysia's Mass Rapid Transit Corporation (MRTC) is one of the first in Asia leveraging cloud-based collaboration on a connected data environment for its 51-kilometer Klang Valley Mass Rapid Transit (KVMRT) system's Sungai Buloh–Serdang–Putrajaya (SSP) line.

In partnership with Microsoft global partner Bentley Systems, MRTC aims to complete the project on time and within budget, benefitting from a projected 35 percent productivity increase in the design, construction, and operation of this infrastructure through seamless information sharing and collaboration powered by Microsoft Azure.

The Azure-hosted Bentley Systems platform enabled MRTC to increase precision of construction, to 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 federated model for coordinated design, despite the participation of numerous external vendors and decentralized information on this complex project.

In fact, the use of the federated platform has enabled over 1,500 users on the connected data environment to collaborate on more than 45,000 documents, corresponding to 750 GB of design files, to make confident decisions and actions in design and construction. MRTC was able to improve efficiency of design coordination and achieve a significant reduction of design clashes by

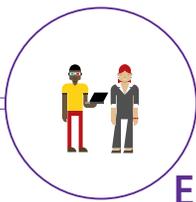
the final design stage. This repository also provided the basis for efficient ongoing asset management for the optimal lifecycle of this critical infrastructure.

Multi-layered challenges prompt digitization of processes

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 must manage 30 percent more consultants involved in the SSP line, all of whom need direct access to the common database to continuously update design information, eliminating outdated and misinterpreted information.

“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.”

— Kaushik Chakraborty, Vice President, Regional Executive, Asia South, Bentley Systems



Enabling greater collaboration with Bentley Systems and Microsoft Azure

Poh Seng Tiok, director of planning and design with MRTC 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 connected 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."

With the increased use of mature building information modeling (BIM) methodology in civil construction projects, a cloud-based, intelligent 3D model-based process provides many advantages for large-scale infrastructure projects similar to the KVMRT SSP line. However, even as BIM methodology matures from the use of 2D CAD and electronic print-based processes to 3D CAD and electronic data sharing based on industry standards, the added complexity of managing a multidiscipline team meant that MRTC needed to address collaboration strategies.

Poh explains: "This issue was further aggravated with the manpower and talent crunch, and the local government's ambitious plan to raise labor productivity levels aggressively by 2020. This meant that MRTC needed to adopt a platform to ensure quick, secure, and efficient onboarding of its engineers for the project, while ensuring an improved level of productivity. The platform deployed allowed the team to identify potential issues through visualization, where the advanced modeling helped its engineers quickly detect any design clashes."

Poh added: "Therefore, MRTC decided to adopt a BIM maturity level 2 strategy for the KVMRT SSP line, as well as the use of a connected data environment for a collaborative workflow to cut the reliance of manual processes. It is the first metro project in Asia to adopt BIM level 2, an advanced way of working that leverages digital collaboration and has become a standard for many leading governments for public-sector projects. With this implementation, all parties involved can use their own 3D BIM models. However, design information is shared through a connected data environment, which enables any organization to combine data with their own to create a federated BIM model."

MRTC chose Bentley System's ProjectWise and AssetWise to manage both the execution of this project and future asset management. By leveraging Microsoft's Azure cloud services, ProjectWise and AssetWise enable all project disciplines to work dynamically using a federated model for coordinated design. With a cloud-based platform, information can be shared across various parties, reducing the risk of data loss and rework due to misinterpretation.

The CONNECT Edition ProjectWise and AssetWise solutions make the design, construction, and operation of infrastructure assets easier for owners, consulting firms, and their supply chains around the world. This model of coordination also enables the integration of design and asset information with operation and maintenance systems to ensure optimal asset performance throughout the project and asset lifecycle.



With this deployment, MRTC was able to conduct a fortnightly virtual design review process, allowing its diverse teams to review and coordinate their respective models, regardless of locations. This process standardized collaboration across all teams and helped identify and mitigate potential issues, before they impacted cost, schedule, and safety. This is a large improvement from work on the first KVMRT line (SBK line) that relied on 2D drawings and a traditional Electronic Document Management System (EDMS) workflow. The approach is expected to increase productivity by an estimated 35 percent, while reducing design rework by providing accurate information the project team could trust. Poh highlighted: "The team is confident to see much less rework on site, which will help us meet our goal of delivering the project within the targeted time and cost."

Poh added: "We have seen improvements in the execution of the SSP line despite the increased complexities faced. For example, we were able to reduce the number of on-site resolution meetings that required the attendance of all stakeholders, because the virtual design review allowed us to identify design clashes in earlier stages. More importantly, embracing digital has enabled MRTC to improve our productivity, while also enabling our workers to acquire new skillsets necessary to adhere to the BIM standards that will be mandatory in civil engineering projects from 2020."

Embracing digital transformation to achieve greater efficiencies

"As industries and economies are impacted by digital transformation, organizations that go digital will stand to benefit from real-time insights and analysis," Microsoft Asia Pacific Vice President Alberto Granados said. "MRTC's use of Bentley Systems' ProjectWise and AssetWise solutions has shown the value of a connected data environment and an integrated project information management and collaboration platform. This is made possible by the state-of-art Azure platform and services, a testament of how Microsoft's technology empowers every organization to achieve more. Large-scale, personnel-and-capital-intensive infrastructure projects can significantly benefit from the scalability, information integration, and collaboration offered with deploying a cloud-based solution, which in turn, positively impacts citizens and economies."

"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," said Kaushik Chakraborty, vice president, regional executive, Asia South, Bentley Systems.