

GYSEV uses video, LiDAR and AI to optimize track maintenance operations



Client profile

GYSEV is a regional railway company that offers cross-border public rail passenger services in Western Hungary and Eastern Austria.

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We chose NTT DATA for the consolidation project because they are AI experts, and they have an excellent relationship with Dell Technologies, our preferred provider. Their partnership was instrumental in getting all the devices shipped in time to meet our deadlines.”

Tibor Ikker, Railway Director, GYSEV

20%

lower total cost of ownership

20%

reduction in maintenance time

10%

fewer train delays

Business need

Leverage AI to enhance track maintenance

Trains and tracks need regular maintenance – and so does the area around the tracks. Precise identification of the surrounding objects and predicting potential shifts is crucial.

Trees have to be cut back to prevent branches from falling on the track, to avoid hitting the power lines and to minimize the risk of slippery rails caused by falling leaves, which can lead to wheel-slide. The types of trees are identified by AI based on their leaves and their growing rates are predicted to enable planning for clearing and other required maintenance.

It's also important to attend to walls or other structures that need repairing before they affect railway operations.

Usually, rail companies send out a team to inspect the rails at set intervals and note any issues that need attention. To make rail maintenance more effective, GYSEV was investigating how to use sensors and AI to monitor their train routes and detect anomalies that could indicate problems.

This is only one of their AI use cases; they're working on several initiatives to boost health and safety, improve the commuter experience and streamline processes.

Having several projects across different infrastructures and AI platforms resulted in some projects overusing their AI infrastructures while others did not make full use of theirs. GYSEV wanted to consolidate their AI initiatives to make better use of resources and become more cost-efficient.

Solution

Taking data from train to data center to insights

GYSEV brought in NTT DATA to standardize their AI infrastructure to simplify their AI projects and make the infrastructure more efficient.

We approached the project from two angles: consulting on the overall AI technical architecture and assisting with the project to monitor tracks using cameras and 3D scanners mounted on the trains and cars.

For the architecture, we started by looking at the infrastructure that GYSEV was already using for their AI projects. This included infrastructure from different vendors. By understanding the resources they already had, we could create a strategy for providing a standardized solution with the processing power needed for AI applications.

The standardized infrastructure we designed uses technology from Dell Technologies, NVIDIA and VMware. To get the necessary hardware to the site, we drew on our global partnership with Dell Technologies and were able to source and ship the components to deliver the project on time and within budget.

For the track-maintenance project, data captured from trains moving at high speeds had to be processed to create a digital twin of the train routes. This 3D model provides information on everything the cameras can see, from fallen branches to issues with power pylons or damage to other infrastructure.

The challenge was how to send the data from the cameras for processing without driving up costs. While the cloud is efficient for processing data generated in the cloud, the data for the digital twin is generated on trains. It is expensive to transfer data onto and off the cloud. We therefore leveraged GYSEV's existing data center infrastructure to process the data on-premises by private AI solution.

Outcomes

Automated monitoring for intelligent maintenance

With an integrated approach to AI infrastructure, GYSEV is adding AI and automation to their existing processes, and they're ready to develop new use cases. Their infrastructure is geared to handle the huge amount of data their sensors capture and turn data into useful insights for planning and maintenance.

Reduce costs

Using a single platform for several AI projects lowers hardware and maintenance costs, infrastructure can be managed through one platform

Reduce track-maintenance time

The maintenance team uses data to proactively maintain the tracks and surrounding areas. By addressing potential issues before they can become big and expensive problems, they keep downtime to a minimum.

Prevent train delays and keep passengers safe

Commuters rely on trains to get them to their destination on time, but their safety comes first. Trains stop for hazards on the track and start moving again only once the hazard is cleared. With a view of potential hazards (like tree branches about to fall), maintenance teams can clear the track when the line isn't in use.

Support better planning

The longer the cameras and sensors run, the more data the AI has to train on. Over time, it will get better at predicting maintenance patterns, seasonal changes and anomalies. These insights can be used to make informed decisions and plan for the future.

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We were excited to see how AI could make trains run on time and keep our commuters happy, so we're running several AI projects at once. The problem was that each project had its own infrastructure, meaning that some teams had too little while others had too much.

We needed a standardized solution to be more efficient.”

Tibor Ikker, Railway Director, GYSEV

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