BNSF Railway: Improving Train Safety and Operations with IBM Services Platform with Watson

IBM

BUSINESS CHALLENGE:

BNSF Railway, as one of North America's largest railroads, ingests data from thousands of sensors aboard trains and alongside tracks. The company needed a system to make use of this data to improve safety and reliability—in real time.

TRANSFORMATION:

In partnership with IBM Services, BNSF was able to better leverage its sensor data by using IBM Services Platform with Watson's predictive analytics and dynamic automation capabilities. These efforts empowered BNSF employees in the field to proactively address potential problems, reducing safety incidents such as derailments.

IMPROVEMENTS IN SAFETY AND RELIABILITY:

BNSF, headquartered in Fort Worth, Texas, manages more than 32,000 miles of track crisscrossed by 1,400 trains every day. As part of a partnership that goes back to 2002, IBM and BNSF worked together on a system to turn data gathered from thousands of sensors into actionable insights.

These sensors provide data on potential defects. For example, trackside sensors monitor temperature and acoustics to look for hot bearings and cracked wheels or axels. And sensors aboard trains monitor wheel load, fuel levels, and other data. "Through the data analysis, we can tell when exactly, within a two-hour window, a bearing on a train is going to fail," says Jeremy Whitson, Chief Architect from IBM for the BNSF Railway account.

With the help of proactive analytics, railroad personnel can stay ahead of problems and keep trains moving safely and reliably. IBM is also deploying a new system for continuous compliance to ensure systems are compliant with best practice configurations and security. All together, these initiatives ensure reliable systems to BNSF and service for customers who count on BNSF to deliver freight across North America.

> *Our locomotives have basically become digital assets—in the amount of information they have, and the sensor networks that ensure they're operating properly.*
>
> –MARK SCHULZE
> VP of Safety, Training, and Operations, BNSF

BNSF WITH IBM:

4.4 billion transactions per day handled by BNSF's Transportation Support System

A **50% reduction in the employee injury rate** over the last 10 years

More than **3,000 wayside detectors** collecting data 24/7

A **60% reduction in derailments** since 2008

A JOURNEY TO BETTER TECHNOLOGY

Tracing its roots back to the 1840s, BNSF continues to innovate with new technologies through its partnership with IBM Services. Among their achievements is the Transportation Support System, or TSS. Key to managing all freight movement across BNSF, TSS handles billions of transactions every day and requires extremely high availability. IBM was part of the original team that helped develop TSS and continues to manage BNSF's data centers, develop strategic roadmaps, and provide day-to-day support.

IBM has also partnered with BNSF on a crew transportation system, a mobile-enabled system that helps pick up and drop off train crews in the right places.

And technology continues to open new opportunities for rail transportation. Already, BNSF has begun using drones with high-resolution cameras to conduct track inspections on bridges and other hard-to-access places.

With all this information streaming back, data management and analytics have become increasingly important, and the IBM partnership helps ensure BNSF is well positioned for the future.

BNSF BY THE NUMBERS:

32,500 route miles serving 28 U.S. states, three Canadian provinces, and Mexico

More than **40,000** employees

About **8,000** locomotives

Moved **5.2 million** intermodal shipments in 2016

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