

# Q&A: Norfolk Southern's Journey with TIBCO

TIBCO Chief Analytics Officer Michael O'Connell recently had the opportunity for a conversation with executives from Norfolk Southern railway, Director of Business Process and Systems Jonathan Holliday and Superintendent of Locomotive Analysis Josef Kaufer.

They discuss Norfolk Southern's journey with TIBCO and the way it's adapting to COVID-19 while continuing to deliver high-quality rail service.

**Q Michael O'Connell: Can you tell us a little bit about Norfolk Southern and some of the trends currently unfolding in the rail and trucking industry?**

**Jonathan Holliday:** Norfolk Southern is one of a handful of Class 1 freight railroads in North America. Our geography expands from the Mississippi River eastward to the Atlantic Coast, from Florida to Canada, covering 19,500 route miles. Over the last couple of years, we've experienced pressure to become faster and more consistent. Our customers demand transparency with our data, giving them access to information that helps them understand when their shipments will arrive and why delays occur.

**Q MO: What areas of your business are trending? How have you been dealing with the pandemic?**

**JH:** Being a freight railroad, we have a very diverse portfolio of products. The traditional products, such as our bulk commodities like grain and coal, are still a big part of our business, and over the last couple of years, we've improved our service to become more competitive with the truck market as we see that's an area for growth. Other growth areas include our automotive and industrial products franchises.

The pandemic has challenged how quickly we can react to the market. At the beginning of the COVID-19 shutdowns, the automotive plants were the first to cease operations. We had to pivot our operations to stop our automotive trains from running and re-focus those resources elsewhere. It's been even more important to rapidly scale the resources up as this business returned. We leveraged a lot of our data resources in-house to figure out where we needed to focus as the various industries came back online.

**Q MO: Can you tell us about that journey you've been on the last couple of years and the strategy you've developed in re-configuring your operations?**

**JH:** Several years ago, the company was doing well, but our service wasn't exactly where it needed to be. It wasn't for a lack of trying. We took a step back and underwent a process that we called "clean sheeting," beginning in our operations area. This is literally taking a white board and looking at the operations as if you could rebuild them from the ground up.

In doing so, we integrated a set of principles known as Precision Scheduled Railroading, which focus on a high-velocity, regularly scheduled, balanced network. In order to achieve these outcomes, asset utilization is extremely important. At other railroads, you generally achieve this through cost-cutting, but at Norfolk Southern, we wanted to open the opportunity to grow as our customers grew. So, how do you do this? How do you take down resources, rationalize resources to make your network faster and also leave room for you and your customers to grow? Well, we really had to look at our technology and our data. Getting the right data to the right place at the right time to make the right decision, really aided in our journey.

**Q MO: How do you use KPIs to measure success? What role does TIBCO play?**

**JH:** We had a real issue with decentralized data. We didn't know one system had better information than another, and that latent data between departments was being shared. So, we started with TIBCO BusinessWorks software, which internally we called the Transportation Event Processor, or TEP. This allowed us to centralize events on the railroad and create a day in the life of the railroad within the TEP. Now, all applications can reach out to one source and have the same information as the next. Everything is consistent as far as timing, and we can leverage this not

only with TIBCO products, but with many other applications, such as our external e-commerce site and even our mobile apps.

**Q MO: Josef, we've just heard from Jonathan on strategy and clean sheeting from the ground up. Can you tell us a little bit about the network operating center?**

**Josef Kaufer:** Back in 2018, Norfolk Southern made the decision to centralize all of its dispatching functions. Before that, our dispatchers were located in nine separate offices on nine different divisions throughout our network. By doing this we are able to communicate better, as well as deliver data and metrics internally and to our customers in near real time. We've used a variety of TIBCO products, mainly Spotfire analytics, to deliver these metrics to the dispatchers so that they can make decisions based on what they're seeing in the data. We provide information on the location of trains, late trains, priority shipments for high value customers to show if they're running ahead of schedule, behind schedule, or on time. We are also highlighting "velocity killers," such as a train that is sitting on a line, and thus bringing down our overall fleet velocity.

**Q MO: Measuring a key performance indicator like a velocity killer is a great first step to drive performance improvement. Have you seen improvements in the metrics you defined?**

**JK:** Absolutely. When we first started measuring velocity killers, we were tracking about 100 trains that were sitting for at least four hours on our network, which is very disruptive. It increases your need for assets—both locomotives and crews—and decreases your car velocity. So you can't use the railcars as frequently as you would like. We improved that to where we are now seeing about 20 trains sitting idle for two hours at any time across our system.

**Q MO: How have your customers reacted to this?**

**JK:** Our customers have benefited from the clean sheeting by having a more predictable product delivery. By de-cluttering our network and eliminating those velocity killers, we're able to run a more scheduled railroad, and if we can produce a train that arrives at its destination on time seven out of seven days of the week, our customers greatly benefit. So not only does it help Norfolk Southern in managing our assets by having a more predictable flow, it also helps our customers by having a more predictable arrival of their product.

**Q MO: You both mentioned that TIBCO Spotfire analytics is central to a lot of this, but what about some of the other surrounding technologies? Can you talk about that upstream of the analytics?**

**JH:** We are leveraging several TIBCO products, using TIBCO messaging and event processing to collect and process our operations data and then feed it to our data warehouse for analysis and reporting. We have many data sources, and we're working with TIBCO Data Virtualization software to help bring these sources together. We have a couple cloud applications now that are being heavily utilized, and we're looking to connect these to our data virtualization environment. We are also looking into additional IoT data streams which would be extremely beneficial in analysis and reporting, and understanding operations on a real time basis.

**Q MO: How many trains do you have in operation on any given day, and how do you ensure the data for each is refreshed and delivered in a timely manner?**

**JH:** Each day trains run throughout our territory and each one is important to our success. We consistently monitor and

proactively manage them all. We do all types of data refreshes on a rolling basis. It's very important that we have timely updates. One of the recent areas we're really excited about is bringing our Spotfire mobile applications to a wider audience. Being an organization across 22 states, we have many employees all along the eastern portion of the United States, and they're not always by a computer or tablet. We're excited to bring a rich interaction with the Spotfire mobile app, where people can interact with their data, rather than scroll through many pages of a PDF report to find the one line they need, and that gums up their email inbox.

**JK:** In our Network Operations Center we have various displays that show information with updates occurring every two to three minutes. We have the ability to write back to our databases through the Spotfire solution to collect information from the manager of train operations (MTO). If anything goes wrong, for instance a velocity killer occurs on the division, the MTO is entering information into Spotfire and writing back to the database, and the information they enter is distributed to the network operations center and to anybody who has the browser version of Spotfire opened for that particular metric, velocity killers. In the future, we're going to be pushing this through the mobile app so that anybody who has access to the visualization there will see it in real time as well.

**Learn more about Norfolk Southern's innovative Network Operations Center [here](#)**

**Q MO: How do you plan to handle the peak volumes coming up? What are you looking for over the next month or so as we head into holidays?**

**JK:** Everybody across the country, especially in COVID times, has been shipping packages or ordering packages online, and ramps up during the holiday season when

everybody's buying gifts for one another, and the volumes from our shippers increase dramatically. We put an increased focus on high priority trains that are carrying these packages, which have guaranteed service delivery windows. At the railroad, we need to hit those service windows, or we end up having to jump through hoops to make the deadlines for each of those shipments. Every time one of these containers or trailers is launched or sent out from its origin, we start tracking it in the network operations center, and we can tell you what train it's on, if it's on time, and if it looks like it's going to make its destination on time for its scheduled delivery. That's a very big focus, and we have special visualizations that are developed for this time of year.

**Q MO: It seems like this digitization of the railway is creating new opportunities in your battle versus the trucking industry. Do you feel like you're making progress in that area?**

**JH:** Absolutely, and I would say that it's really not a path we chose. It's a path we have to take. Our customers are demanding it, and we're demanding it in order to leverage our assets even better and utilize all pieces of our infrastructure. So I would agree, I think things are going really, really well. We've still got a lot of work to do, but we're on a great path, and leveraging some of the TIBCO products has made things a lot easier.

**Q MO: Digitization seems to be a big part of the journey you're on. Providing customers these near real-time updates right at their fingertips feels like a big part of it.**

**JK:** The mobile aspect is going to be huge for Norfolk Southern. Being able to tell our mechanical supervisors or our transportation supervisors out in the field the importance of a particular train that they're working on or that they're looking to move across the network is going to be a game changer. Mobile is on the front burner for us, for internal stakeholders and all of our customers, and we're looking forward to it.

**To learn more about Norfolk Southern's journey with TIBCO, watch their [customer session at TIBCO NOW 2020](#).**



**Global Headquarters**  
**3307 Hillview Avenue**  
**Palo Alto, CA 94304**  
**+1 650-846-1000 TEL**  
**+1 800-420-8450**  
**+1 650-846-1005 FAX**  
**www.tibco.com**

TIBCO Software Inc. unlocks the potential of real-time data for making faster, smarter decisions. Our Connected Intelligence platform seamlessly connects any application or data source; intelligently unifies data for greater access, trust, and control; and confidently predicts outcomes in real time and at scale. Learn how solutions to our customers' most critical business challenges are made possible by TIBCO at [www.tibco.com](http://www.tibco.com).

©2021, TIBCO Software Inc. All rights reserved. TIBCO and the TIBCO logo are trademarks or registered trademarks of TIBCO Software Inc. or its subsidiaries in the United States and/or other countries. All other product and company names and marks in this document are the property of their respective owners and mentioned for identification purposes only.

16Mar2021