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## Case 1: Burlington Northern

### **The Rail Industry**

E-commerce has transformed the global market in terms of consumers' buying power. Expectations for products and services have shifted, on-demand and just-in-time deliveries are highly coveted, and costly options provided by companies. This shift has altered demand and impacts buying decisions due to consumers' newfound sensitivity to the quality of delivery rather than the product or service alone.

In North America, the term intermodal refers to containerized rail transportation (Rodrigue and Slack). All around the world, it can be described more broadly as an exchange of passengers or freights between two transportation modes. However, it is more commonly used to refer to freight and container transportation. The transportation modes can refer to carriers, thus each is issuing its own tickets or contracts.

Rail transportation began to decline following the introduction of truck shipping in the 1980's. The railways were better suited for the natural resources industry, but trucking was preferred for food, electronics, and textiles (Rodrigue and Slack). Refrigerated trucks secured a large chunk of the transportation market. Despite this, the rail industry did retain a majority of the commodity.

### **Burlington Northern Railroad**

Burlington Northern Railroad (BN) was a rail shipping company that transported a variety of product, most notably coal and grain. These products were relatively

inexpensive, shipped in large amounts, not as susceptible to damage in transit, and did not expire quickly thus creating low time sensitivity. In addition, they owned land grants which contained a variety of natural resources. As rail transportation decreased, BN's business did as well. They already had existing infrastructure since they had been in operation since 1970. By 1990, they arrived at a level junction. Nine years prior, managers began looking into automated control technology. They were concerned with transporting products between the origin to destination in the shortest time possible. They began brainstorming a project that would need processes, policies, and new practices to address this concern.

### **Advanced Railroad Electronics System (ARES)**

Managers proposed the Advanced Railroad Electronics System (ARES) which was estimated to cost 350 million dollars. ARES was an automated and interconnected railroad system that would include rail stations, trains, and employees that comprised BN's system. This system would aim to solve the issues BN was dealing with. Their goal was increased efficiency and competing with the trucking industry. They asked themselves if ARES would assist in reaching that goal.

The short answer is: Yes. ARES could tackle BN's greatest bottleneck, travel time (Goldratt). It would facilitate communication between employees including MOW crews, engineers, and railway dispatchers. On top of this it would track active trains and manage them. This tracking and management would assist with estimating travel times and delays, thus reducing travel time all-together. In addition, BN could begin creating travel schedules by utilizing data they did not previously have. Arrival and departure data could automatically generate itineraries.

Tracking also assisted with repairs of both tracks and the trains themselves. MOW crews would no longer have to guess when a train would arrive. They could clear debris or repair tracks without having to estimate when a train would blow through, thus reducing accidents and collisions. ARES also introduced train diagnostics. By collecting data, engineers could predict issues rather than react to them. This meaningful data would allow them to monitor the health of the trains. Railroad cars and locomotives with up-to-date repairs increase the safety and integrity of the entire train.

At the time, dispatchers managed 30 trains while on duty, but realistically could only focus on seven at a time. This inattention creates dangerous situations when there are multiple trains on the same stretches of tracks. By implementing ARES, employees could track trains and schedule maintenance by using their locations. Proponents of ARES argued it would advance BN “from the Iron Age to the Electronic Age” (Cash et. al). Dissenters were more focused on the hefty price tag.

### **Industry Competitive Advantage**

Burlington Northern’s ICA is cost leadership. They delivered high volumes of natural resources, thus achieving economies of scale (Tanwar 12). Their cost leadership strategy was successful, as they had few competitors. They shipped these bulk amounts more effectively than their existing rivals.

### **Porter’s Five Forces Model**

Railroad companies themselves own tracks in the United States. As previously mentioned, BN, owned land through federal grants. Furthermore, freight railroad companies are privately owned and operated (Freudenrich). Today, Burlington Northern Railroad is a part of BNSF Railway which is around 400 different railroad lines that

merged or were acquired (BNSF Railway). Using Porter's Five Forces Model, we can examine BNSF's competition. A benefit of the mergers is that they own the resources of each absorbed company. BNSF is one of only seven Class I railroads (Federal Railroad Administration). The major substitute and threat to the railroad industry is obviously trucking. It is completely possible that new entrants emerge in the rail industry, but it is highly unlikely (FME). Class I railroads must have operating revenues of \$490 million or more. In addition, they already possess capital and infrastructure that supports this status. Reaching this level and competing with giants that have been established in excess of a hundred years ago would be difficult. External suppliers don't have much bargaining power because BNSF owns the land in which most of their resources are harvested. However, suppliers that provide parts for tracks and trains may continue to exert influence on the company. Lastly, there is the bargaining power of customers. As stated in the introduction, consumers will turn to companies that can deliver their products and services quickly and reliably.

## **Stakeholders**

There are eight major stakeholders that would be affected by the ARES decision. Integrating ARES into Burlington Northern's process affects their executives and shareholders. BN employees such as dispatchers, MOW crews, station personnel, and engineers are all stakeholders. In the long-term, customers of BN would be affected. Lastly, there is the ARES development team itself. The decision to implement ARES will affect each of these stakeholders in diverse ways.

## **Continuing with ARES**

Burlington Northern could have decided to see the ARES project to completion. Continuing came with inherent monetary risks. They may have overshot the estimated budget which would sink a lot of capital. Integrating the system and training employees may have been more costly than they imagined. Company-wide adoption is difficult to achieve, it may have taken years to transition to ARES. In the meantime, processes may have been updated which creates revisions for the development team thus creating a backlog of work. In addition, when changes are implemented, employees must then be re-trained. Testing also comes with risks, a simple bug could be extremely dangerous for those working on live tracks. These risks may have lead to an unsuccessful integration of ARES.

If BN could have mitigated these risks, a successful integration was possible. ARES would have allowed BN to increase efficiency as a direct result of accurately scheduling trains, reducing crowded lines, and reducing or removing delays. Employees could have operated more effectively and safely with the new tools ARES offered. To summarize, BN would have become more competitive and attracted and retained customers with these modern changes.

## **Cancel ARES and Consider Alternatives**

BN could've canceled the ARES project and considered another solution. The Advanced Train Control System (ATCS) being developed by the Association of American Railroads (AAR) was an option, though some believed ARES was ahead of this project. Therefore, it may have taken years for ATCS to be ready for implementation. When the product became ready, BN would be categorized as an early

adopter. This means they would be exposing themselves to many if not all the same risks that ARES involved. Shareholders would have no say in development requirements, and they would be at the mercy of other developers. Customers would certainly feel the delays during the stagnant period and transition period.

It must be noted that ARES was intended to control the entire railroad system, while ATCS controlled trains. BN had already tested prototypes, but AAR was only beginning to map specifications. Using a third-parties' system mean investing less capital than creating a brand-new system. However, there are still equal if not greater transition costs, all while gaining fewer features.

### **Cancel ARES and Continue Operating**

Burlington Northern could survive if they continued operating the company as they had been. However, they had already noticed a decline in business, hence drafting and testing the ARES project to begin with. They would initially stay afloat, but they wouldn't be able to sustain themselves in the long term. Shipping natural resources is still easiest by rail, and BN does possess the infrastructure necessary to do this. However, they will eventually fall behind companies who do implement systems like ATCS or their own version of ARES. They will lose business that can be carried out by trucks and their market share will decline, affecting shareholders. Employees will be affected as they continue to work in dangerous conditions. They will eventually completely lose business to trucks and other railroad companies.

## **Recommendation**

Burlington Northern had already sunk nine years into the research and initial development of ARES. It is my recommendation that they should have continued with ARES and implemented the new system. I recognize that there are financial and technological considerations, but it could've revitalized and save the company.

Today, it is still a wildly debated case. ARES was not successfully implemented, which I believe was a mistake (Van Schwartz). I think it would have revolutionized the industry. BN wouldn't have had such a difficult time competing with other companies, they could've absorbed railroads rather than merging with the Atchison, Topeka and Santa Fe Railway.

The capital gains from ARES would've helped mitigate the development and transition costs. On top of this, it would have propelled BN and kept them in the "Super Seven," which were the seven largest of the then-twelve U.S. Class I railroads. ARES could've been sold to other railroads which opens licensing options.

If they choose to do nothing, they will simply be unable to compete with other intermodal transportation such as rail companies and trucks. This hurts market share which hurts their stakeholders. Choosing to abandon the project means wasting the capital and time that has already been invested in the project. Both options can put BN out of business. Moving forward is the possibility attached with the most to gain.

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