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## Burlington Northern Case Study

### Case Background / The Problems

Burlington Northern Railroad is a logistics company that was formed in 1970 when a merger of four different railroads. Through this merger the company not only obtained a vast amount of railroad, but also obtained a substantial amount of natural resources such as: extensive land grant holdings containing minerals, timber, oil and gas. Burlington Northern carries massive shipments of in expensive goods, and these goods are not susceptible to damage in transit and have low time sensitivity. A company like Burlington Northern strives for efficiency in every aspect of their business, because once someone can ship for less, they lose their competitive advantage. Because of this Burlington Northern's business strategy is Cost Leadership. "This strategy emphasizes efficiency. By producing high volumes of standardized products, the firm hopes to take advantage of economies of scale and experience curve effects. The product is often a basic no frills product that is produced at a relatively low cost and made available to a very large customer base. (Tanwar)" Burlington Northern is constantly seeking ways to reduce its cost, while also increasing the amount of goods per train car.

By the year 1989, Burlington Northern had up to 800 trains running on their rails generating \$4.606 million in revenue and \$242 million in net income. Burlington Northern was a transcontinental operation with offices ranging from Ft. Worth, Texas to St. Paul, Minnesota, but

the Operations Department located in Overland Park, Kansas was the largest department within Burlington Northern. Burlington Northern's stream of revenue came primarily from seven different sectors: coal, agriculture commodities, industrial products, intermodal, forest products, food and consumer products, and automotive products. Burlington Northern's total assets equaled out to \$6.146 billion, and its capital expenditures were \$465 million, roughly half of this was generated by the railways.

Burlington Northern was broken down into three headquarters in varying places in the country. The CEO, COO, and corporate functions were located in Ft. Worth, Texas; where they focused on finances, strategic planning, marketing, and labor relations. The largest of their three department was located in Overland Park, Kansas, where they oversaw all aspects of Operations such as: train dispatchers, operators, their supervisors, and managed research and development, engineering, and maintenance. Finally, the remainder of the corporate staff functions were overseen in St. Paul, Minnesota, they mainly focused on Information Systems Services, but they were not restricted to just Information Systems Services.

Burlington Northern is currently deciding whether or not to invest in a new automated railroad control system called the Advanced Railroad Electronics System (ARES). ARES is expected to cost \$350 million and would radically change the way railroad operations is planned and controlled. The idea of ARES came from the aviation industry, and the chairman of Burlington Northern were skeptical because, they did not know if the technology used in another industry could be used and work with trains. The ARES system used GPS technology to pinpoint the location of trains in route. Prior to ARES technology Burlington Northern would be able to pinpoint their trains within a range of 10 to 15 miles, while with ARES there would be a range of

give or take 100 feet. The ARES system can be broken down into three parts: control, data, and vehicle.

The control aspect is used to produce schedules, it does this through the regulation of the trains speed and position. The control aspect can also alert dispatchers of violations so that the conductor can alter them before the authorities catch them, which as a product reduces downtime because they wouldn't have to deal with the authorities. But higher utilization of equipment and labor are the major implications of the control aspect.

The next aspect of the ARES project is data. The data aspect of the ARES system is communication component of the system. The communication occurring within the ARES system is between the trains and the control segment.

The final aspect of the ARES project is the vehicle aspect. This consisted of an onboard computer, a keypad, performance monitors, and a throttle brake that could be activated by the computer or the on-board dispatcher. The vehicle aspect also incorporated an Energy Management System that used information about the track conditions, fuel considerations, speed limits and weight of the cars to determine the optimal speed for the train. Furthermore, the vehicle aspect incorporated a Locomotive Analysis and Reporting System (LARS) which used several sensors to monitor the health and efficiency of the train cars. This is a form of preventive maintenance because it minimalizes the breaking down of locomotives.

Despite, all the benefits brought to fruition by the ARES system and its developers, the executives at Burlington Northern were still exceptionally cautious of moving forward with this industry changing endeavor. ARES was years ahead of other technological systems at this time and could yield massive pay offs. Yet executives could not determine whether it was the correct decision moving forward.

## Stakeholders

**Employees:** Burlington Northern's employees have a stake in any and all decisions made by the company. They have a stake because there is a potential for new jobs, potential for the loss of some jobs, and even a possibility for increased wages for some workers.

**Customers:** Burlington Northern's customers will be affected by any decision made regarding the railroad because it is their goods being shipped. Any increase in efficiency of operations will have an impact on a customer's supply chain.

**Shareholders:** Burlington Northern's shareholders are anyone who owns stock in the company. They are stakeholders because any debt taken on by Burlington Northern has the potential to drag down the price of their stock. This is especially concerning because if the project runs into any unexpected delays or problems that could push Burlington Northern over its allotted cost for the project.

## Industry Competitive Analysis

Burlington Northern is a railroad company competing in the transportation industry. They have little threat from inter-industry competition, new entrants, or the bargaining power of its customers or suppliers.

### Generic Strategy

Burlington Northern must operate in a Cost Leadership Strategy. The railroad industry is driven by the lowest competitor. Why would a company pay Burlington Northern more money to ship their good, if another company could do it for less?

### Organizational Structure

Throughout this case Burlington Northern's organizational structure is not explicitly talked about, but it can be inferred that the company utilizes a functional structure. This is

inferred by Burlington Northern's segmentation of departments in three distinct headquarters, to which are ran by differing corporate staff members. "A successful company organization strategy includes organizational, control, and cultural variables, which are managerial levers used by decision makers to effect changes in their organizations" (Cash, Eccles and Nohria).

### **Porter's Five Forces**

**Competitive Rivalry:** Burlington Northern's competitive rivalry is low. At this time Union Pacific was there biggest competitor, and they were already underway with their new investments to improve their track infrastructure. Along with that the Association of American Railroads (AAR) was in the process of developing the Advanced Train Control System (ATCS), which would control the trains, but unlike ARES it would not control the entire railroad operation (Hertenstein and Kaplan).

**Threat of New Entrants:** Burlington Northern's threat of new entrants is low because the company was a result of the merger of four different companies. All four companies brought a substantial amount of assets to the merger for example: lands, train cars, and railroads. For a new company to enter they would need a large amount of capital, because they would need to build their own railroads and everything else need to run a railroad, unlike Burlington Northern who has the assets of previously four railroad companies.

**Threat of Substitutes:** Burlington Northern has a rather high threat of substitutes in the form of trucking companies. According to the Motor Carrier Act of 1980, truckers were granted much greater freedom in setting their own rates and enter markets (Hertenstein and Kaplan). Yes, it is true that trucking companies are more expensive, but when dealing with time intensive products companies are willing to spend more on shipping for the convenience factor.

**Bargaining Power of Suppliers:** Burlington Northern's bargaining power of suppliers is high because at this time the industry is dominated by Burlington Northern and Union Pacific; this gives them a great deal of leverage. While they must keep their prices competitive with one another, they can still choose the price for their labor, and the price of labor has a significant power.

**Bargaining Power of Customers:** Burlington Northern's bargaining power of customers is moderate, because if they do not innovate with the times like Union Pacific is doing with their investing in technological improvements, then they have a chance of losing their customers to Union Pacific. They would lose their customers because they would fall behind Union Pacific in pricing and overall customer satisfaction.

## Alternatives

**Implement ARES:** Burlington Northern as an organization would need to make some wide changes throughout the company. Also, there would be an upfront investment of \$350 million. To build the control center it would cost roughly \$80 million, the data link would cost roughly \$80 million, and the on-board equipment for the trains would cost roughly \$200 million. The fact that the train schedules are not being optimized, according to Goldratt, is a bottleneck. If the bottleneck is elevated, throughput will increase (Goldratt, Cox, and Whitford). Employees as stakeholders would be affected by the potential for people getting laid off or reduction in hours due to optimized schedules. On the other hand, the implementation of ARES would make the railroads a much safer place for the maintenance workers. Customers as stakeholders would see the implementation of ARES as a good thing, because Burlington Northern prices will most likely drop due to optimized schedules. Shareholders of Burlington Northern could see a decrease in the price of the Burlington Northern stock due to the increased debt taken on by the

company, but it would not be for long because Burlington Northern would soon become the industry leader with the implementation of ARES.

**Do nothing:** If Burlington Northern decides to do nothing and continue with their current infrastructure. Employees would not be laid off due to the implementation of innovative technology, and maintenance crew would still be susceptible to a high risk because they do not have extremely accurate GPS system. Customers would suffer due to the lower quality service, longer wait times on shipments, and no decrease in prices. Shareholders would not suffer short term because the stock price wouldn't change drastically, but for long term investments they would suffer because competitors such as Union Pacific could implement ARES; this would give the wrong message to the shareholders making them think that Burlington Northern is stuck in the past and refuses to change with the times.

**Implement ATCS:** If Burlington Northern implemented ATCS instead of ARES there would be similar cost benefit analysis for the implementation, but not all the features that come along with ARES, such as, the safety benefits and GPS satellites. The employees might still encounter some lay offs due to the implementation of innovative technology, but they would still be susceptible to the risks involved with maintenance. The customers would potentially see a decrease in price due to the increasing optimization of the schedule. The shareholders would most likely see an increase in the price of Burlington Northern's stock because they are seen as an innovative company.

## Recommendation

I would recommend Burlington Northern to implement the ARES system, because of the options available it is the most technologically advanced, and yields the greatest reward, both financially and safety wise. With the use of ARES Burlington Northern would be able pinpoint

the location of their trains within 100 ft. Compared to what they used to be able to do which was within 10 to 15 miles. Due to this it allows them to not only increase the safety of their maintenance employees, but it also allows them to create industry changing optimized schedules. Furthermore, ARES would be able to monitor the train cars status because every train car would be fitted with sensors that will trigger an alert when something needs to be fixed. This not only makes maintenance easier, but it also decreases downtime because they won't have to wait for approval by authorities. Generally, both within Burlington Northern and within the general population ARES will make the railroads safer. "Trains are estimated to kill 1 person every 100 minutes. Each year nearly 1,000 people are killed in train related accidents. (Associates)" This has both a cost and a safety implication because cost will be lowered due to trains not being broken down on the tracks as often. It has safety implications because if a train is down they will be able to change the route of possible incoming trains, avoiding any unwanted collisions.



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