

Case 1: Burlington Northern

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ARES System Analysis

“The goal of a company is to make money now and in the future” (Goldratt). Rephrasing this excerpt from *The Goal* by Goldratt, the goal of an organization is to survive. To survive in any market, firms need to innovate and develop new and competitive ways to operate their businesses. The nature of the railroad industry is one of cost leadership, that is, where “A low cost producer/provider must find and exploit all sources of cost advantage. If a firm can achieve and sustain overall cost leadership, then it will be an above average performer in its industry, provided it can command prices at or near the industry average” (Josiah). Burlington Northern strives to provide reliable transportation and delivery services to its customers in a cost-efficient manner. The Advanced Railroad Electronics System, or ARES, is an attempt by Burlington Northern to develop and implement a system that makes exploiting cost advantages easier and more streamlined, while improving the reliability, and dependability of their delivery dates for customers, thus helping them maintain a competitive advantage.

Currently, Burlington Northern’s operations suffer from numerous inefficiencies that seem to stem from a breakdown in communication among the various aspects of their operations. By not being able to share important information among parts of the operation, time, money, and labor are wasted, as maintenance crews are sent out for repairs with no guarantee they will have the time to complete the work, or that malfunctions with the locomotives remain unnoticed until

a major breakdown occurs. It is evident there is much room for improvement in the way Burlington Northern manages its resources.

In theory, ARES sounds like an amazing opportunity to improve core business processes in an innovative way, but are the potential returns worth the cost and the risk? The cost to purchase the hardware, develop the code, and build the infrastructure of ARES is estimated to be in the ballpark of \$350 million, while the potential benefits of the system are estimated to be around \$600 million. It is worth mentioning, the figures used in generating an amount for total benefits are subject to considerable uncertainty, so actual benefits could be much less.

Another factor to take into consideration is the large amount of debt Burlington Northern issued during their restructuring. Their debt-to-total-capital ratio is high, especially for their industry, so that makes investing in ARES that much more of a risky decision, as they could quickly go bankrupt if things go south. It comes down to if Burlington Northern wants risk their survival on innovation. If ARES could be successfully implemented and utilized, it would greatly benefit Burlington Northern in the short and long term by setting them apart from their competitors and allowing them to serve their customers in a reliable, low cost way, so the issue remains of whether to sink considerably more resources into the project or take another course of action. An analysis of Porter's five forces can help provide a better picture how Burlington Northern stands in the industry.

Porter's Five Forces Analysis

Other railroads and trucking are the biggest competitors Burlington Northern has in the industry. Its main competitor in hauling coal is the Union Pacific railroad, which has made considerable investments in laying new track, and purchasing newer, more advanced locomotives, making it very likely they have excess capacity in their operations; this could work against Burlington Northern. As of today, Burlington Northern's main source of revenue is its transportation of coal, primarily from the Powder River Basin in Wyoming and Montana. It has invested heavily in laying rail to service this area, and if new government regulations go into effect, they may see an increase in demand for their services. This could act as double-edged sword; on one hand, increased business means more potential revenue, on the other, Burlington Northern is already operating at close to capacity on its lines, meaning it may not be able to keep up with the extra demand.

Transportation of grain and other commodities like cars, lumber, and chemicals serve as a major source of business for Burlington Northern. With just in time production practices becoming more prevalent in manufacturing and the time sensitive nature of shipping perishable items like food, transportation by rail is becoming a less-than-ideal mode of getting goods from point A to point B. The more feasible and practical alternative is shipment by truck. With their lower cost and improved dependability, it is no surprise trucking has taken over transportation of many commodities since the end of WWII. Trucks have greater flexibility to make up for unexpected delays during transportation; trains do not have this flexibility. On Burlington Northern's lines, when a train "meets" or passes another train on its line, one must be diverted to a siding causing a delay, and with this occurring thousands of times a day with Burlington Northern's trains, many shipments experience delays. Trucks also provide delivery directly to the

door of the customer, which is something trains simply cannot and have never been able to do or compete with. These delays have led more and more customers to view trucking as a desirable alternative, so the threat of substitutes is very real. Top executives are quickly coming to realize they are going to have to compete with non-traditional competitors, as a study by IBM states, “These new competitors aren’t just set to steal market share; they are turning whole industries upside down” (IBM).

Exacerbating this threat is an existing problem with cost leadership strategies, which is the fact customers often seek for whoever has the lowest cost, meaning they have more bargaining power. “A cost leadership strategy may have the disadvantage of lower customer loyalty, as price-sensitive customers will switch once a lower-priced substitute is available” (Josiah). Repeat purchase behavior from customers is more of a hassle as more continue to seek lower cost alternatives that meet their needs. While the shipment of grain and coal is relatively insensitive to delivery delays, shipments of other commodities are not, and customers have the option to use other services to remove these delays. Burlington Northern needs to address this threat, or risk losing business.

The threat of new entrants is relatively low. The railroad industry is hard to break into, and, as mentioned previously, many rail companies have gone bankrupt or out of business due to the high cost nature of acquiring and maintaining assets. Another potential force to take into consideration is supplier power. Little is mentioned of suppliers in the case, but it is probably safe to assume that they have considerable bargaining power. Any variations in price for fuel, new locomotives, or parts for repairs could have a potentially large impact on the way Burlington Northern conducts its business, since Burlington Northern conducts maintenance checks relatively frequently and have an aging fleet of trains that will require more frequent repairs.

Effect on Stakeholders

Any attempt to solve the problems facing Burlington Northern will affect its stakeholders, both internal and external. Some important internal stakeholders to take into consideration are the organization itself and its employees. Whether or not ARES, or some other course of action is taken, the organization's standing in the industry will be affected. If an implementation is successful and the organization's communication issues are remedied, Burlington Northern stands to gain a distinct competitive advantage, but it also risks suffering a considerable setback if they fail.

ARES would have a huge impact on management and employees in various functional areas of Burlington Northern's operations. Management, with improved information on train schedules, maintenance and fuel statuses, and the ability to relay that information to ground crews, operation staff stand to make decisions that allow them to run their operations in a much more efficient manner. However, it is worth noting that just because there will be more data available to the end-user, there is no guarantee they will be able to put it to good use. "The growing flood of internal and external information is too much for individual users to digest and determine its relevance to their work" (Fried). Burlington Northern needs to take steps to ensure employees know how to interpret and put information to good use, and if done properly many improvements in operations may occur. Maintenance crews may be able to operate in a much more structured, safe way with less wasted trips. Safety may also be improved, as there will be more advanced monitoring and notification systems put in place. Burlington Northern may also be able to better make use of their existing capacity, therefore increasing their productivity by increasing their output without increasing inputs.

As far external stakeholders go, consumers and competitors will also be affected. Consumers of their transportation services will likely experience more prompt delivery times, lower prices, and improved reliability for their shipments, due to lower cycle times and improved capacity. These improvements may entice customers who ship more perishable items to use Burlington Northern's services more frequently. Competitors in the railroad industry would be forced to make improvements in their operations by increasing their capacity, lowering their prices, or improving their cycle times. Burlington Northern would be able to better utilize their infrastructure and build better relations with customers, which would most definitely increase pressure on their competitors in the rail and trucking industry. If Burlington Northern could improve their cycle time and dependability, they would also be able to put pressure on their trucking competition.

Courses of Action

There are several courses of action Burlington Northern could take with regards to ARES. The first, and probably safest option, would be to do nothing, that is not implement ARES and potentially drop the project. This option would allow for Burlington Northern to continue to operate their business in much the same way they have, allowing them to aggressively pay down their debts. They will likely be in the same, or even better, fiscal position, as their primary market for generating revenue is relatively stable, and they will be able to shrink the amount of money they owe. The impact on employees and management of the company will be relatively small, as they will continue to perform their jobs as they always have. There will also probably be little change to how customer relations currently stand since the company will continue to provide their services as they always have. The main negative impact would be that

doing nothing puts Burlington Northern's competitors at an advantage, since they'll have the opportunity to innovate and improve their operations.

Another option is to go ahead with a full-scale implementation of ARES and spend the time, money, and manpower needed to put the system into place. This option contains the most risk as failure means a significant loss of valuable resources which would be detrimental to the organization's overall health, while success means potentially large improvements in operating efficiency and customer relations. ARES may lead to better management of Burlington Northern's resources, reduced operating costs, and better customer relations, but as mentioned earlier, there is reasonable doubt that the projected benefits of ARES have been overly optimistic and therefore are somewhat unreliable, and that the project has out grown its original scope. The impact on stakeholders is also worth mentioning. Employees and managers from all over the organization will likely see vast changes in their job responsibilities, and new employees may be hired to fill new support roles. These changes to existing job responsibilities may be difficult to adjust to and could cause some friction with employees, making a successful implementation of the system that much more difficult. As far as the effect on competitors, a success would mean that Burlington Northern would gain key competitive advantages over the competition setting them up nicely in the industry, while a failure would leave them in a similar or worse position than they are in now. As far as customers are concerned, a successful full-scale implementation of ARES would likely mean improved service dependability and consistency, with lower prices.

A third option would be to not fully implement ARES, and instead develop and take certain feasible aspects of the system and use those to try and provide a benefit to the organization at less cost than required for a full-scale implementation. The Locomotive Analysis and Reporting System (LARS), which would be used to track data on trains in operation, and the

Energy Management System, which would monitor how much fuel a train is using and give insights on how to improve fuel-efficiency, are two components which could easily be separated from the rest of the ARES project. Also, these two systems are estimated to provide large benefits to Burlington Northern, and they are either ready for more testing or being reworked to improve their effectiveness. However, continuing to develop and implement these systems will require more funds and time the company may not be able to spare. The effect on employees and management wouldn't be as dramatic as if ARES was fully implemented. There would still be changes to existing jobs, and managers would have to make new kinds of decisions, the overall implementation of a smaller system would likely be less difficult. Competitively, Burlington Northern still stands to gain by implementing a smaller system. The insights they may gain into their operations may allow them to improve service to customers, make more effective use of existing capacity, and reduce operating expenses. For customers, the impact of a smaller implementation would probably be beneficial in the form of lower costs and improved dependability, as Burlington Northern may be able to improve their efficiency and increase capacity.

Recommended Course of Action: Why?

Burlington Northern should not implement ARES. Currently, Burlington Northern has a considerable amount of debt, with a debt-to-total-capital ratio close to 70%, which is high even for the railroad industry where costs of acquiring assets is high. "Companies unable to service their own debt may be forced to sell off assets or declare bankruptcy" (Ross). Recognizing the severity of their situation, Burlington Northern's leadership has been trying to aggressively pay back the money they owe, so funds for investment are tight. Plus, Burlington Northern's fleet of trains and infrastructure are rapidly aging and becoming outdated, and they will require heavy

expenditures to replace. It becomes apparent then that the \$350 million dollars that are needed to implement ARES could be used for more pressing matters.

“The major obstacles to implementing change in an enterprise are centered on people and corporate culture” (IBM). The scope of ARES is another reason to seriously consider not implementing the system. ARES would require radical changes to various business processes, and while the potential benefits are large, sweeping changes such as these are often difficult to implement successfully. Even if the software is perfected, and the necessary hardware is provided, at the end of the day it is going to be the employees who use ARES hand-on that are going to determine whether the system can be successfully implemented and utilized or not. The amount of training and time that are going to be necessary for people to accept and learn how to use the system will be quite large, which will result in more resources and time being poured into ARES. ARES does seem to be at a stage where it could easily be integrated with existing jobs which makes success of the system seem that less likely. “In practice, however, the user organization is often not willing—or able—to take on responsibility for the technology at the point in its evolution at which the development group wants to hand it over” (Harvard). If the project is not finished, users will have a much more difficult time adopting and learning how to use the system.

The reason there should be no investment made in trying to salvage some parts of ARES and develop and implement those is much the same for not fully implementing the system. Burlington Northern simply does not have the funds, time, and resources to continue investing in projects like this, or at least not for the moment. In addition, implementing a system of any sort is often difficult; while the effects on the organization’s stakeholders would be smaller overall than a full implementation of the system, there is still considerable risk. If the investment does

not pay off Burlington Northern will be much worse off than it began, with wasted valuable resources.

Burlington Northern's competitors seem more interested in investing in significantly lower risk alternatives like enhancing their rail infrastructure and acquiring newer, more efficient locomotives. These changes will most likely enable them to enhance their capacity and improve their efficiency at a lower cost and lower risk, so if Burlington Northern's gamble in ARES does not pay off, they will have made a terrible mistake that may have detrimental effects on the company's ability to stay in business.

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