Simulate, Educate, Innovate!

Evaluating Llenroc's Outsourcing Proposal

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Synopsis

To outsource . . . or not to outsource?

. . . that is the question Kirsten Carlson is struggling to answer for Llenroc Industries, a manufacturer of document management systems based in upstate New York. Despite Llenroc's relentless focus on manufacturing cost reduction and product innovation, margins on its five key, low-end products are being continually squeezed by offshore competitors.

Llenroc's CFO has commissioned a leading consulting firm to conduct a study of alternative manufacturing locations and firms to determine the lowest total cost supplier, and to recommend where production should take place. Their proposal recommends closing a portion of the New York manufacturing facility devoted to the manufacture of the five products, and outsourcing production to a company in Malaysia.

120 employees would be laid off.

He has asked Kirsten to review the proposal and make a recommendation to the Board of Directors.

As Kirsten studies the proposal, she is increasingly less comfortable with it. Are the assumptions and calculations accurate? Are the projected savings real? How will customer service – a critical element of Llenroc's new marketing strategy - be impacted?

Llenroc Industries: Company Background

Llenroc Industries, founded in Upstate New York in the 1950s, was a pioneer in the development of a broad range of low cost, high performance document management systems. Subsequently the company broadened its product line considerably to include higher cost, high volume document management products as well as a range of computer hardware and software related to processing, managing, and storing of data. Currently the company's annual sales revenues are approximately $6.5 billion.

The sales of the low-end products have increased dramatically over the past decade. Correspondingly, production has increased to the point where there are now manufacturing plants supplying Llenroc in Asia and Europe as well as in Upstate New York. Furthermore, Asian production is largely performed by external contractors, which are experts at low-cost manufacturing.

The production of 5 key low-end products is carried out presently in the Upstate New York plant, along with some other higher-end products.

The Situation

Over the past five years, the competition among producers and marketers of document management systems has been fierce. As a consequence, Llenroc has consistently focused on product innovation and cost reduction to preserve market share and pricing power. Nonetheless, the competitive nature of the market environment has resulted in reduced manufacturing margins and increased emphasis on lowering manufacturing costs.

The manufacturing margins on the five low-end products produced in the Upstate New York facility have, in particular, been eroding for some time. Hence the CFO, Larry Judge, Jr., has been relentless in his desire to stop production of these five products in this plant and to outsource the production to a contractor he has identified in Malaysia. Judge had the Manufacturing V.P., Anna Jamison, carefully evaluate alternative contractors to ensure that their manufacturing capabilities matched those needed to produce a consistently high quality product. Anna identified a number of qualified suppliers, in addition to Llenroc's internal source, but was particularly impressed with the Malaysian facility. Judge then contracted with a consulting firm, Bagum & Skinum, to conduct a thorough study of all the alternative manufacturing locations and organizations to determine the lowest total cost supplier of these five products, and to recommend where production should take place for the five products.

The Proposal

As Kirsten Carlson sat down to review the reports provided to her each morning, the one authored by Bagum & Skinum was on top. At Judge's insistence, Carlson was to make a recommendation to the company's Board about the Bagum & Skinum proposal within three weeks. Their proposal recommended closing the portion of the Upstate New York manufacturing facility devoted to the manufacture of the five products and to outsource the production to the Malaysian company identified by Anna Jamison.

The proposal carefully laid out the reasons for the recommendation. First, the unit manufacturing cost would be 30% lower than it would be in the Upstate New York plant. This calculation was based on labor costs and on overhead on the production facility directly related to these products. Second, transportation costs were considered as well. Given that the production would be shipped from Asia to the distribution facility that would remain in Upstate New York, transportation costs were a critical component of total costs. According to the Bagum & Skinum proposal, normal shipments would be made from Singapore in container loads via ocean freighting. Third, there were costs associated with shutting down the production in the plant and starting up production in Malaysia. About 120 employees would be laid off in the Upstate plant and severance pay would have to be considered. Some equipment would be shipped from the New York plant to Asia for use in the contractor's plant. Engineering support would be needed to insure that production began smoothly and continued to perform well. Inventories would have to be increased to cover the lost capacity due to the startup period. Initially there would also be some expedited freight charges to get some of the production to the US more rapidly. Fourth, tax implications were taken into account for duties on the imported products. Finally, Bagum & Skinum had discussed with suppliers that all the contractors' costs would be denominated in US dollars to protect against currency fluctuations.

As Kirsten Carlson studied the proposal, she became less comfortable with the recommendation. While the overall total cost per unit delivered to the central warehouse in Upstate New York was projected to be 10% lower than current total cost, she had some major concerns. Specifically, she wanted to make sure the calculations were accurate and the projected savings were real. She also wanted to ensure that customer service levels would be maintained. Service was an essential component of the Company's marketing strategy. They guaranteed next-day delivery from the warehouse to their customers. To do this cost effectively, they needed to maintain a 98% off-the-shelf fill rate from their Upstate New York warehouses. The fill rate target was based on the manufacturing facilities capacity to produce enough products every day, in combination with the finished goods inventory plan, so that only 2% of the output had to be shipped to customers with a reasonable expedited freight charge. The study did not address what the impact on customer service might be.

While pondering the strengths and possible weaknesses in the consultant's report, Kirsten left her office to attend a meeting with Llenroc's Marketing V.P., Brian Delcourt. Kirsten and Brian had been working on a plan to improve the degree of collaboration between Llenroc and its customers. Brian and his team had spent a considerable amount of time during the past three months identifying opportunities, costs, and effects of improving supply chain integration with customers. The purpose of the meeting was for him to report on the results of his team's efforts.

The Collaboration Meeting

Brian began by summarizing the overall nature of the customers' demand for Llenroc's five low-end products produced in the Upstate plant as well as for other product lines. Llenroc's customers for these five products included major electronics chain stores, independent distributors, as well as many industrial accounts. Not surprisingly, about 18% of the 837 customers purchasing these five product types accounted for 80% of the units shipped from the New York State warehouse for these products. In fact, just 41 customers accounted for 53% of these shipments.

Brian pointed out that shipments to all customers were made in full-trailer loads (which hold an amount of product equal to that placed in a container in the Singapore port). He noted that these 41 largest customers all had their own inventory policies and distribution plans, and that their distribution plans (the movement of product in their logistics systems) were set for ten days in the future with their logistics providers. Their inventory policies were typically of the (s, S) type[1] and hence the orders placed on Llenroc were more "lumpy" than the requirements set in their distribution plans.

Brian had just completed a seminar on supply chain management in which there was a focus on the causes and effects of uncertainty and variability in supply chains. In fact, he convinced Kirsten that he should undertake the collaboration study based on what he had heard at the seminar – namely, that collaboration in supply chains would reduce uncertainty and variability. This in turn would lower costs and improve service. What he observed through his study was that both Llenroc's and their customers' costs could be reduced through collaboration. Llenroc

[1] When an item's inventory position (on hand plus on order minus backorders) reaches s or fewer units, a replenishment order is placed to raise the inventory position to S units.

would benefit by seeing customer demand over the next ten-day horizon, and could ship to their customers in a manner that more closely matched the customer's actual need. This was different than waiting for the customer to place a replenishment order. Llenroc could, in effect, manage the inventories for the collaborating customers. The customers would benefit by lowering their investment in inventories, improving the reliability of delivery, and lowering the cost of managing their inventories.

Brian had made tentative agreements with each of the 41 key customers to explore how to make the collaborative relationship work. While collaboration had the potential to reduce the demand uncertainty at Llenroc, everyone also recognized that the customers themselves faced demand uncertainty from their markets. Poor forecasts were a fact of life in this industry. When Brian suggested a thirty-day frozen horizon for firm orders, Llenroc's customers rejected the notion because they the time between the receipt of orders and delivery to end consumers was far less than thirty-days. That is, Llenroc's customers were unwilling to assume the associated risk. They then jointly examined the order and production data very closely. They observed that the production system had flexibility to reliably meet on-time deliveries to the end consumers within a ten-day time window if Llenroc was given ten-days of advanced demand information. Brian and Llenroc's customers agreed to move forward with this collaborative effort. The next steps were to determine what information and business process changes would be required to implement the collaboration plan. All of these 41 customers were eager to determine how to reduce supply chain costs and to improve service levels.

Brian reported to Kirsten what these requirements would be for both Llenroc and its customers. It was obvious that the cost of setting up the required infrastructure would be recovered within a few months. Ongoing costs of about $600,000 per year would be needed, but this amount would be more than offset by reductions in inventory and lowered transportation costs. The transportation costs were lower because the ten-day window of the customers' shipping schedule gave

Llenroc's transportation provider more flexibility in moving the product to the customer. Furthermore, Brian estimated that they would get about a 99%+ fill rate from current stocks and hence could either lower Llenroc's inventories or reduce premium transportation charges. Brian's enthusiasm for the implementation of the collaboration supply chain plan was obvious to Kirsten and all others attending the meeting. Brian was convinced that this plan would not only reduce current costs, but would also be a key to strengthening relationships with their customers.

The Issue

As Kirsten thought about the implications of Brian's proposal, she began to think about the impact the manufacturing outsourcing plan proposed by Bagum & Skinum would have on the ability and the cost of meeting the requirements of the collaboration proposal. It was not clear how, or if, the two proposals would work together. What would collaboration mean and would collaboration be feasible under an outsourced manufacturing strategy? Would the potential collaborative cost savings more than offset the projected savings through outsourcing? What are the risks associated with these different approaches? The meeting came to an end with Kirsten thanking Brian and his team for their efforts and promising to get back with them shortly to discuss how the plan should be put into practice.

Question 1. Data Gathering

Kirsten recognized the need to decide quickly as to whether or not to accept Judge's outsourcing proposal. Given her uneasiness, she has asked her auditing staff to conduct their own analysis. She asked them to provide a statement of their data requirements to conduct the study, which she would pass on to Eleanor Anton, Llenroc's CIO. In order to complete the task in a timely manner, she requests that the list of data requirements be provided to her within three days. What additional questions would you pose? What data would you request? How would you use the data?

Question 2. Bagum & Skinum Data and Analysis Tables

The data used and calculations made are contained in the appendix. In particular, notice that the Malaysian supplier has stipulated both a maximum amount of daily supply as well as a “take or pay” clause that essentially bounds Llenroc’s obligation below through a minimum daily purchase quantity. Review and assess the data and conclusions drawn from the Bagum & Skinum analysis. What factors and considerations have the consultant’s ignored? How would they affect the recommendation to outsource?

Question 3. Incorporating Uncertainty into the Analysis

At the center of Kirsten's concerns is the observation that the consulting report did not seem to address what impact, if any, uncertainty could have on the ability of Llenroc's supply chain to maintain its high level of customer service. Kirsten needs to know exactly what measures need to be taken to insure that service will not be sacrificed. She is very concerned about inventories. She also needs to know how well the outsourced supply chain can cope with and respond to large shifts in market demand. Furthermore, it is not clear what impact outsourcing would have on Brian's collaborative proposal.

What are the additional financial and operating considerations and what are the risks associated with Bagum & Skinum's proposal? How does uncertainty in lead time from the outsourced supplier affect inventories, operating costs, and customer service levels? Use the Llenroc supply chain simulator and financial calculator to assist you and your team in the analysis.