Analyzing Distribution Network Options at Remingtin Medical Devices

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Analyzing Distribution Network Options at Remingtin Medical Devices

Yusen Xia[†] **and Walter L. Wallace**[‡]

The orthopedics medical device industry is fairly large, intensely competitive, and highly innovative with worldwide sales of more than $300 billion in 2011. The United States is the largest medical devices market, with estimated sales of roughly $95 billion in 2010. The aging U.S. population represents a major catalyst for demand of medical devices. The elderly population (persons 65 years and older) is estimated to grow from roughly 40 million in 2010 to 72 million by 2030, ensuring a major boost for medical devices utilized.

This is the market that Remingtin Medical Devices, headquartered in Atlanta, Georgia, has participated in for the last thirty-plus years. Remingtin, despite the maturity of the market and its product offerings, believes that its supply chain network and inventory management systems are quite unsophisticated. For the last 30 years, Remingtin has lived with legacy systems that are not optimizing inventory levels or transportation costs for U.S. markets. In an industry where the *sale* is critical, inventory and working capital optimization take a back seat to revenue and profit margins.

Inventory is held at multiple sites across the U.S. supply chain, including Remingtin's centralized distribution center in Atlanta and nearly 100 field locations, for delivery via courier to hospitals. Sales

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representatives keep additional inventory in the trunks of their respective cars and garages. Beyond these inventory locations, each hospital will hold a consigned inventory put in place and at the expense of Remingtin. There are two avenues for inventory planning by the hospital: scheduled surgeries where there will be seven or more days to plan and obtain inventory, and emergency (trauma) surgeries where there are 24 hours or less to have inventory in place.

Over the years, Remingtin's sales reps have developed partnership relations with the surgical doctors that prefer Remingtin's orthopedic medical devices. The switching cost of changing from one medical device provider to another is somewhat prohibitive; therefore, once Remingtin locks in with a resident surgeon, it is very difficult for a competitor to sell to that surgeon.

Because there are multiple surgeons in a hospital and each may be using a different medical device provider, the inventory levels at the hospitals grow exponentially. There are over 300 various surgical implant sizes necessary for a single knee replacement surgery and about the same number for a hip replacement surgery. Each size must be included in each surgery kit to ensure adequate inventory in case of an emergency surgery. Although not as time-sensitive, even scheduled surgeries require a complete medical device kit with each possible size of implant included to be able to perform any necessary variations of a surgery.

When an implant part is used during a surgery, it will trigger a replenishment order from the National Distribution Center (Atlanta). Each implant part is valued at approximately $2,000, and a complete kit is valued at approximately $600,000. Once an implant has been used, the kit is not available for another surgery until the used part has been replaced.

The medical device industry has faced a host of issues over the last several years, including pricing concerns, health care reform, reimbursement pressures, and increasing regulatory involvement at the state and federal levels. These issues have put downward pressure on profit margins and have caused Remingtin to take stock and reconsider the systems and procedures that it has in place to support its supply chain network, inventory management systems, and transportation methods. Remingtin believes that it has delayed the inevitable

long enough. Managers now realize that something must be done to optimize their service parts logistics model and to do what it takes to stop the erosion of profit margins.

Remingtin turned to UPS Supply Chain Solutions for help. UPS offered a 10-step modeling process for Remingtin's consideration:

Step 1: Evaluate initial project scope
Step 2: Gather detailed data set
Step 3: Identify improvement opportunities
Step 4: Establish assumptions
Step 5: Baseline existing network
Step 6: Develop alternative scenarios
Step 7: Run scenarios for optimization
Step 8: Rationalize new scenarios
Step 9: Compare scenarios to each other and baseline
Step 10: Present project conclusions

UPS thought that it was critical to establish a baseline of the current network and then to develop alternative strategies to be evaluated for potential cost savings. Once this step was completed, UPS would recommend new network and transportation strategies and how they should be configured in the U.S. market. This would be followed by estimating implementation costs and issues associated with the implementation. Appendix 1 presents the baseline information, along with three solutions that were among several solutions offered early on by UPS. Note that the reported "Average Zone" figures are used by UPS to index Remingtin's shipping costs. The larger the Average Zone, the more expensive it is for Remingtin for shipping.

Remingtin raised the question with UPS regarding the benefits versus the cost incurred with the Southeast "milk run" delivery network originating out of Atlanta. This was costing the company just shy of $1 million. The obvious advantage was delivering the orthopedics medical device kits to their own field locations (small distribution centers) within a two-hour driving radius of Atlanta (centralized distribution center) and ensuring adequate kit coverage within that radius. The cost appeared to be extremely high, despite the advantages accrued by Remingtin.

UPS pointed out that the main benefits of milk run delivery networks are the higher utilization of company trucks and the resulting reduction of transportation costs. Other benefits include a reduction of stock, both at the supplier side and at the hospital side, a critical lead-time planning window available by using the firm's own trucks, mitigation of security for high-cost inventory, and cost savings from the integration of reusable recycling containers.

Milk-run solutions will help Remingtin perform multiple drops on a trip instead of using different trucks for different drop points. Remingtin concluded that this model would help save costs while maintaining appropriate lead times. UPS expertise allowed them to work out best routings based on data given and to scrutinize how best to optimize the trucks and thus maximize profitability for their company. Remingtin must now decide whether or not to expand the concept of milk runs with new decentralized distribution centers located within high-volume markets.

Questions

1. What are the major problems faced by Remingtin?
2. With analysis, comment on the three solutions listed previously.
3. What are the major factors (both short-term and long-term) that you would consider in helping Remingtin?
4. What other solutions can you propose to help Remingtin?

Appendix 1: Baseline Data and Three Solutions Offered by UPS

Baseline: Single Distribution Center (National DC: Atlanta) to Replenish All Branch Locations

Small parcel; 806,123 annual shipments; $20,875,321 annual expense

- Average Zone 6.12
- Southeast milk run delivery network – $920,100 annual expense
  20,131 kits + 65,213 finished goods parcels
- 100% of the SKUs

Solution 1

Two-DC Network (East/West)—Having a Second Distribution Center in LA

Transportation Analysis Results in Parcels Shipped (% From That Suggested Location)	
Atlanta	523,980 (65%)
Los Angeles	282,143 (35%)
Average Zone Decreases to 4.65	
Outbound expense savings	($712,546)
Estimated inbound expense increase	$213,000
Net transportation savings	($512,812)
Chicago estimated warehouse expense	$3,100,000

Solution 2

Six-DC Network—Having Five Additional D.C. Locations in Chicago, LA, Philadelphia, Dallas, and Louisville

Transportation Analysis Results in Parcels Shipped (% From That Suggested Location)	
Atlanta	241,837 (30%)
Chicago	185,408 (23%)
Los Angeles	96,735 (12%)
Philadelphia	120,918 (15%)
Dallas	72,551 (9%)
Louisville	88,674 (11%)
Average Zone Decreases to 3.12	
Outbound expense savings	($4,301,981)
Estimated inbound expense increase	$312,871
Net transportation savings	($3,521,654)
Five additional DC estimated warehouse expense	$7,123,000

Solution 3

Having Five More DC Locations in Chicago, LA, Philadelphia, Dallas, and Louisville, Including Milk Run Analysis

Transportation Analysis Results in Parcels Shipped (% From That Suggested Location)	
Atlanta	241,837 (30%)
Chicago	185,408 (23%)
Los Angeles	96,735 (12%)
Philadelphia	120,918 (15%)
Dallas	72,551 (9%)
Louisville	88,674 (11%)
Average Zone Decreases to 3.12	
Outbound expense savings	($5,601,340)
Estimated inbound expense increase	$312,871
Net transportation savings	($4,387,432)
Five additional DC estimated warehouse expense	$7,123,000