Case Study

U.S. Stroller

Aliki Aleman, Suhail Nana, Christian Diago, Maria Kristina Carvajal and David Bardayan.

US Stroller is a leader in the production and sales of baby strollers in the US. It has historically made very high quality strollers that sell at a premium price. The company is known for its innovative designs and its good distribution system. US Strollers are sold through major department stores, discount stores, and baby equipment stores. Altogether, 2,000 different sites in the US distribute the company’s products. US Stroller has been market leader for over 50 years. At the present time it has 40 % of the US market, Graco has 20%, Kolcraft 10% and various other companies the remaining, but each with less of 10%. The company counts with three models, the regular model which sells for $49, the deluxe model for $99 and the shopping center model for $149. Currently, the company is selling 106,000 units per year of the three types of strollers. Sales are, of course, irregular and can vary by 25% from the average weekly volumes.US Stroller sales approximately USD$4.5M per year. Net profit is 25% of sales after tax. In 2005 it the net profit was only 2% of the sales.

In the plant, they manufacture three different types of strollers; a regular model, a deluxe model, and a shopping center model. The strollers made by the company consist of from 20 to 30 different parts. All the materials for the manufacturing of the stroller, such as tubing, wheels, padded seats and backs, and plywood, and many more, are purchased from outside vendors and altogether, about 50 percent of the cost of a stroller consists of the materials. Once all the materials arrive at the factory the pieces are prepared for assembly. There are various stations throughout the factory that the materials go through before assembly. The tubes go through the cutting station, bending station, drilling station, and then are put back into storage until needed for assembly. There is also a wood cutting station that consists of one large saw that is used to cut seats and backs inserts from large plywood sheets. These seats and backs are put into inventory until they are needed for assembly.

A master production schedule is prepared on a weekly basis for eight weeks ahead. The schedule is frozen for four weeks to allow time to fabricate the parts required and to get the parts in from outside suppliers. Any parts that are not there when needed are expedited during the last week. New orders are only placed in week 5 or later in the master schedule.

The plant is scheduled in a lot-for-lot basis. Due to this setup, the final assembly line also directly induces setups throughout the plant in tube cutting, drilling, bending, and seat cutting. Any mistake made during the manufacturing process directly affects the total cost of production because the total cost of a changeover at final assembly is thus the cost of changing the final assembly line itself, plus the cost of changing over all the other production equipment affected by the lot-for-lot calculations. The total setup time amounts to about 11 labor hours.

The inventories turn very slowly, at a rate of 2.4 times per year. On an after-tax basis the company has earned 3 percent on net assets and 8 percent on owners’ equity. US Stroller is privately held company. At the present time it has 40 percent of the market but profits have been dropping over the past two years because of price decreases and the inability to maintain margins. High inventories, poor customer service, and high costs. In the U.S. stroller manufacturing plant we can clearly identify the seven wastes. Too much inventory is definitely a huge problem in this case. Not only is the plant over filled with materials waiting to be used for assembly but also with strollers already assembled. There is a storage section for purchased parts as well as storage tube storage and wood storage. The company holds 12 weeks of purchased parts in order to facilitate scheduling with vendors and to prevent line stoppages. Waiting time is another waste. Even though the plant has an excessive amount of inventory of the parts for assembly it is completely disorganized. The master scheduled is frozen for four weeks to get all parts together and ready for assembly, any parts that are not there when needed are expedited during the last week. This is a waste of time and an example of how disorganized their inventory is since the company holds four weeks of in-process inventory to supposedly “provide high machine utilization and to facilitate scheduling.” Also, it takes four weeks to reorder from the factory and one week for transit. Along with waiting time also comes excess processing. The distribution of the manufacturing process and time of all three strollers is very disorganized. The regular model is put into production first, producing 2,400 units on the first week. It will then take an average of two hours per machine to change over the line to the next stroller; time that results in lost capacity. As a result, the rest of the first week is devoted to changeover. Then the deluxe model requires 2.9 days of production scheduled in week 2 and then two hours per machine are required to change over to the shopping center model. Another problem in the plant is the high set up cost. The setup for final assembly of the regular model costs $165 and sale price is $49, for the deluxe model the costs is $185 and sale price is $149, and for the shopping center model costs it $170 and sale price is $149. They have very high and manufacturing costs and still have to compete with the Japanese companies that sell low-price strollers that emphasize quality and reliability of design.

The two strategies the director of manufacturing, Clem Hawkins, came up with were a pull system strategy or manufacturing cells strategy.

In the pull system option three different separate final assembly lines would be set up, one for each finished product. This would help eliminate changeover at final assembly but will come at a cost of about $200,000. This strategy would drastically change the master schedule and allow production of all three models every week and would create a uniform load on the plant making it better to forecast production and inventory needed. It will help reduce inventory drastically at the warehouse to about a 15-30 day supply. The only predicament in the pull system strategy is the utilization of materials and machinery and little flexibility with all dedicated machines. If three separate assembly lines are set up then he would have to reorganize the entire process of each product or purchase a machine dedicated to each model; he would need to purchase a third tube cutter and another saw.

With the manufacturing cells strategy, a manufacturing cell would be provided for each model. Separate equipment would need to be purchased for each cell; one drill, one press, and tube cutter, costing about $150,000. This strategy would have equipment located in close proximity and materials would flow into one end of the cell and finished product out of the other end. Visual control of each cell would be maintained and quality. This will help reduce inventory and cell takes less space and provides fast feedback. The only negative is that a cell gives less flexibility to demand changes.

Since the company already has a determined production rate per week and works with a continuous assembly line we don’t think it needs much room for flexibility in the manufacturing of their products. They make three standardized models with the same specification every time. I believe the best strategy would be the manufacturing cell because its $50,000 cheaper than the pull strategy and I find it more organized. The idea of creating a plant within a plant with would be too costly for just the production of those three models. But with cell manufacturing you can separate manufacture of all three models. Not only will this help reduce inventory but also production time both in ordering the parts, assembling units together and transporting them throughout the plant. This will also allow a more organized MRP. A new master schedule will have to be made but this time it won’t need to be frozen for four weeks to get all parts together. A kit would contain all the purchased parts needed to assemble one unit of the final product. If they decide to go with the pull system, the revised schedule clearly described the exact amount of models produced each week so it would be much easier to calculate the inventory that would be needed. As for the other problem mentioned by Judy Hawkins of poor customer service, they need to hire a human resource manager to handle the four functions of human resource including staffing and recruiting, training and development, motivation, and maintenance.

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As you can see Tube Cutting represent almost 40% of setup time, so if supplier can help them provide ready materials they could save time and money, because they would not pay labor cost or at least they should try to minimize in this activity.

Our recommendation would be to apply a cellular layout, since the production area would be moved closer together, visual control of each cell can be monitored, so any quality issue can be solve at the moment. Also that now each type of product would have different workers meaning that each would specialize in a specific type of stroller so they would acquire expertise and would become the best on their task, so quality check should be performed by the group of worker in charge of each cells. By applying this method inventory would decrease, and we strongly recommend that at least in the long run they should work in group with their suppliers so they can get many raw materials in a “ready” state, meaning that it just need to be assembled to the final product to work more efficiently