Sport Obermeyer

Supply Chain Management
MGT 690
June 5, 2010

Company Background

- Sport Obermeyer designs and merchandises high-end skiwear from its Aspen, Colorado headquarters.
- The products are sold in U.S. department stores and specialty ski shops.
- Although it has a global supply network, most production is done in Hong Kong and China by its partner, Obersport.

Obersport

- Established in 1985.
- It is a joint venture between Sport Obermeyer and a Hong Kong based partner.
- Obersport handles the raw materials and production for all of Sport Obermeyer’s production in the Far East.
- Production is done in independent subcontractors located in Hong Kong and China.

The Supply Chain

Planning Cycle

- Design begins in February of the year before the garments will appear in stores.
- As soon as designs are finalized, samples are produced and shown to retailers during the Las Vegas show. The show is usually held in March.
- Concurrently, materials and components are ordered for the initial production order.
- Usually receive 80% of the annual order volume the week after Las Vegas show.

Planning Cycle Cont.

- During June and July the garments are transported to Obermeyer’s Denver warehouse. This takes approximately six weeks.
- Around the end of August, Obermeyer ships orders to retailers.
- Products go on sale during September. Peak times are December through January.
Time Line
(See Table 2-14, p. 68)

<table>
<thead>
<tr>
<th>Manufacturing Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Prod. Order 50%</td>
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<tr>
<td>2nd Prod. Order 50%</td>
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Production Planning

- Annual production is approximately 200,000 units.
- Maximum production capacity available for cutting and sewing is 30,000 units a month.
- The minimum production quantity per style in China is 1200 units and Hong Kong is 600 units.
- Estimates that earnings are 24% of wholesale price for each unit sold and losses from discounted units are 8% of wholesale price.

Production Planning

10 Styles of Women’s Parkas
(See Table 2-20, page 75)

- How should Wally think about how much of each style he should order in November?

What makes it difficult for Sport Obermeyer to manage its supply chain?

- Long lead times \( \rightarrow \) high inventory
  - Global supply chain (distance / time)
- Early commitment
- Large lot sizes
- Short life cycle
- Uncertain demand
  - Perishable product: one season
  - Historic data useless
  - Late demand signal
- Limited capacity

How many units of each style Obermeyer should order during the initial phase of production? (use the sample data in Table 2-20). [Note: no minimum quantities]

- Class responses varied significantly
  - Focus on reducing risk
  - Gail: 500, 629, 1017
  - Assalut: 1300, 1845, 2525
  - Daphne: 1150, 989, 2300

- Most generally agreed that orders should be placed for styles with the lowest variability and cost (lowest risk)

Speculative v Reactive Capacity

- Speculative Production Capacity
- Reactive Production Capacity
Which Units are Lowest Risk?

- Highest demand
  - More likely that unit will sell
- Less variable (lower $\sigma/\mu$)
- Less expensive
  - Lower overage costs
  - In speculative capacity, you are worried about being over — being under not a problem, because you can always use reactive capacity

Production Planning

- Use a risk-based production sequencing strategy:
  - Produce the least risky items during the first production period using speculative production capacity. That is capacity employed prior to observing additional indicators of market demand.
  - After observing retailer demand in Las Vegas, Wally should update demand forecasts for the remaining units and produce those with the greatest expected return during the second production period using reactive production capacity.

How Should We Measure Risk?

- In the first production period, we are primarily concerned with markdown risk:
  - If we under-produce during the initial production period, we have a second production opportunity.
- What is the relationship between risk and
  - Product price
  - Demand uncertainty
  - Expected demand

Production Planning

No Minimum Order Quantities

- If all styles have the same wholesale price, an effective strategy is to produce up to the same demand percentile for each style.
  - Why?
  - That is, for style $i$ make $\mu_i - k\sigma_i$
- In this case, the strategy takes into account demand uncertainty and expected demand.
- Find the best $k$ so that total production is no more than 10,000 units.

Production Planning

With Minimum Order Quantities

- Ranking products by risk is complicated significantly when imposing minimum order size constraints. Why?
  - Ideally, we would like to make a specific quantity of a style and then "finely tune" the supply of that style by making a few or many units during the second period when market information is available.
  - However, in each production period, large production minimums force us to make either many units of a given style or none.
- Thus, our ability to finely tune the supply of each product is diminished by imposing large minimum order quantities.
Production Planning
With Minimum Order Quantities

- Consider the following styles:
  - Anita (Avg= 3296, Std Dev=2094, CV= 0.65)
  - Gail (Avg= 1017, Std Dev= 388, CV= 0.38)
- If only one production run is allowed, which should Sport Obermeyer produce first?
  - Without minimum order quantity, Sport Obermeyer should produce Gail before Anita
  - With minimum order quantity of 1200 units, Sport Obermeyer should produce Anita before Gail

Effect of Minimum Order Quantity on Stockout and Markdown Costs

Does your answer change if all ten styles in the sample are made in Hong Kong?

- Hong Kong requires lower order quantities
- More flexibility in ordering higher risk styles (i.e. those with lower forecasted demand or higher cost)
- Higher overall costs

What operational changes would you recommend to Wally to improve performance (and lower risk)?

- Reduce lead times
  - Computerize processes
  - Reduce minimum production lot-sizes
  - Do not commit initial production orders to unproven factory (rework, ramp-up)
  - Look for subcontractors who can delivery at a faster rate to fill in gaps
  - Use standardized products
How should Obermeyer management think about sourcing in Hong Kong versus China in the short-term?

**Hong Kong**
- Shorter production time
- Smaller orders better for initial forecast
- Better for higher risk designs

**China**
- Lower overall costs
- Better for lower risk designs

How should Obermeyer management think about sourcing in Hong Kong versus China in the long-term?

**Hong Kong**
- Higher quality products
- Low unemployment means higher wages

**China**
- Unstable political environment
- Import quotas
- Higher minimum order quantities
- Work to increase efficiency/skills

If Wally wants to improve his ability to produce what the market wants, which constraints should he address?

- U.S. government import quotas
- Long lead times...reduce
  - Materials
  - Products
- Large minimum order quantities
- Short product life cycle (1 year)
- Long planning cycle (2 years)...reduce
- Early ordering commitment (without actual demand data)...reduce
- Limited capacity

Increasing Reactive Capacity

- How can we increase reactive capacity?
  - Increase total capacity.
    - How? What can be done with the excess?
  - Increase the number of working hours.
    - What are the dangers of this approach?
  - Use more subcontractor capacity during the peak season.
    - How does this impact in-house capacity?
  - Decrease manufacturing lead time.
  - Decrease raw material lead time.
  - Obtain market information earlier.
    - How?
What recommendations would you make to Wally?

- Develop improved forecasting technique
- Collect/use POS data
- Seek out partnerships to facilitate shorter lead times for raw materials
- Work on better integration of supply chain
  - Try to reduce the number of vendors for greige fabric and other materials
- Work with Chinese facilities to reduce minimum orders and improve worker skills

Accurate Response

- Develop a probabilistic forecast
- Assess markdown and stockout costs
- Determine appropriate production quantities
  - Produce lower risk items early
- Evaluate early demand indicators
- Update forecast demand
- Determine final production quantities

Strategies for Accurate Response

- Reduce minimum order sizes
- Increase reactive capacity
  - Lead time reduction
  - Early market intelligence

Other Coordination Issues to Think About

- What business is Sport Obermeyer in?
  - What must management be good at?
- What business is Obersport in?
  - What must management be good at?
  - What services does it provide Sport Obermeyer?
  - Could Sport Obermeyer deal directly with the factories in Lo Village?

How Obermeyer Responded
Obermeyer’s First Response

- Operational Changes
  - Slashed time for order processing and computing raw material requirements by introducing computerized systems
  - Pre-positioned raw materials in Far East
  - Began using air freight as delivery due dates approached

- Early Write Program
  - Invited 25 largest retail customers to Aspen for sneak preview of upcoming line in order to solicit early orders
  - Since 1990 these orders have resulted in 20% of Obermeyer’s total sales

Results of First Response

- Reduced delivery lead times by more than a month
- Gained important early demand information

- But was it enough?
  - No – about half of production still based on forecasts
  - Track record not particularly good

Additional Changes

- Kept raw materials and production capacity undifferentiated as long as possible
- Booked production capacity well in advance without specifying exact styles until later (assumed risk of supplying raw materials to factories)
- Merged design and production departments to broaden strategy
- Encouraged designers to use same types of raw materials
- Recorded orders for out of stock products

Did it pay off?

<table>
<thead>
<tr>
<th></th>
<th>Before Accurate Response</th>
<th>After Accurate Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total production (units)</td>
<td>121,432</td>
<td>124,805</td>
</tr>
<tr>
<td>Over-production (units)</td>
<td>25,094</td>
<td>22,036</td>
</tr>
<tr>
<td>Under-production (units)</td>
<td>7,493</td>
<td>792</td>
</tr>
<tr>
<td>Over-production as % of sales</td>
<td>1.74%</td>
<td>1.30%</td>
</tr>
<tr>
<td>Under-production of % of sales</td>
<td>1.56%</td>
<td>0.18%</td>
</tr>
<tr>
<td>Total cost as % of sales</td>
<td>3.30%</td>
<td>1.48%</td>
</tr>
</tbody>
</table>

Obermeyer Results (cont.)

- Improved profits by 50% by reducing inventory costs to 1.48% of sales (from 3.3% of sales) - Profit margins in industry around 3% of sales
- No. 1 customer rating.

Summary

- Intelligent forecast process:
  - Obtain early signal;
  - Forecast uncertainty as input to production planning;
  - Forecast update.
- Power of risk-based production planning.
- Use inventory to establish de-coupling point in supply chain (e.g., stock of raw materials in HK).
- Material commonality to improve flexibility.
- Coordinated demand and supply roles.