



Sheridan College Institute of Technology and Advanced Learning
Faculty of Applied Computing and Engineering Sciences

Quality Management

Session FFH Case Study

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Session FFH CASE STUDY

In Class Small Group Case-study

..... and Follow-on report.

TEAM SEATING PLEASE!!!



Welcome to FFH Corp

Furniture-From-Hell
Corporation



Welcome to FFH Corp...

FFH is a privately owned business operated by the original founders the Hope family.

The FFH (Furniture-From-Hell) organization as it was called, makes chairs in many different types and sizes for the residential and commercial market.

We are very concerned about profitability and have asked you people to look at how we do things and offer some advice as things have become more difficult in recent years.

We need both a short term and a long term plan for improved profitability....

Capital is only available in the long term, and we would like to see the capital funded from short term savings.



The organization has 5 sites in 5 cities in North America and a component manufacturing partner in Shanghai China.

The manufacturing process.....

We make the chair frame from steel tube and we have 25 different steel frame designs using 5 different tube material sizes.

The Tube material/s is ordered via local distributors from a tube mill in Japan with a 10 week lead-time

We use special designed connection pins to connect the frames together with drilled and threaded inserts to act as bushings for these pins. The pins and bushings are purchased from our China facility.

No single frame design is more than 5% of the total annual demand but mix demand varies considerable through-out the year by as much as 5 times the average mix ratios with little ability to forecast these trends.

We must maintain inventory at all times to satisfy the customer's immediate demands.

The customer's order the whole range of products every day and we cannot keep up with demand which is good except we have to hold a considerable mix of inventory and I wish we could make more margin .

Our price is sensitive and must be competitive.

The frame tube is cut, formed on tube benders, end-finished and drilled in our in-house fabrication factory...

They are organized by process type with multiple machines as follows.

2 Tube shears (cut to length for bending) 1 hour changeover per tube size only

8 Tube benders each has a 1 hour changeover per tube size and 30 minutes changeover per frame design.

10 End finishers/saws... 15 min changeover per material size

12 Drill machines... 5 minute changeover per frame design.

Each process machine has about 1 week of inventory ahead of it.

The tube raw material (5 sizes) is stored due to space in a remote warehouse 5 miles away

Capacity.....

The paint line only runs 2 shifts

The Tube benders run all 3 shifts

The shear runs 50% of 1 shift

The End finishers/saws run 1 shift

The drill machines run 2 shifts

The bending equipment is not very reliable and we lose about 15 hours per week per machine (3 shifts) on these tube benders and about 1 hour per week for each other machine.

Our average scrap yield is about 8% on the benders, 5 % on the end finishers and the other processes about 2%

We paint the frames in 8 different colors including black and white on a powder paint line which has a common pre-treat line and 3 powder paint booths in parallel configuration and a common post cure oven.

The color change over time is 2 hours for each color. Our paint rework due to post paint handling is about 5% with the parts needing to be recycled to the paint supplier.

An inter-facility truck is used to bring in raw tube and also send components to the paint supplier who is 15 miles away.

We have considerable handling and distance between the fabrication and the paint supplier (25 miles) and from the paint supplier to our assembly plant. (10 miles)

We work 3 shifts where necessary and are workforce is reasonably cross trained.

We have a separate seat and backrest making facility which is in another city 100 miles away. These are made in 5 different colors but only one standard design. This facility is highly automated and does not appear to be a bottleneck at this time.

All our capital is old and we are considering upgrading but need to ensure it is a productive solution.

The largest quality problem is with pins and bushing/inserts that we have to 100% inspect and sometimes sort and match to get a good fit to avoid customer complaints. A separate QC report is included. It shows that about 50 % of the time pins and bushings/inserts do not match. It is costing us significant inspection efforts and delays.

1000 pc sample

| mm | Pins | Bushing |
|--------------|-------------|-------------|
| 4.50 | | |
| 4.55 | | |
| 4.60 | | |
| 4.65 | | |
| 4.70 | | |
| 4.75 | | |
| 4.80 | 2 | |
| 4.85 | 20 | |
| 4.90 | 40 | 15 |
| 4.95 | 103 | 100 |
| 5.00 | 500 | 250 |
| 5.05 | 290 | 450 |
| 5.10 | 30 | 100 |
| 5.15 | 10 | 50 |
| 5.20 | 5 | 20 |
| 5.25 | | 10 |
| 5.30 | | 5 |
| 5.35 | | |
| 5.40 | | |
| 5.45 | | |
| 5.50 | | |
| 5.55 | | |
| 5.60 | | |
| 5.65 | | |
| 5.70 | | |
| 5.75 | | |
| Total | 1000 | 1000 |

Fit =0.05mm

Our assembly plant is next to the seat and backrest manufacturing plant and feeds an adjacent large but completely full finished goods warehouse.

The assembly plant tries hard to sometimes build to order but we are faced with a large finished goods stock of about 60 days.

The customer expects delivery ship in 3 days after order date. If we fail to ship in this window customers can cancel orders.

Our transportation (distribution) costs between facilities are very high.

We spend a considerable amount of overhead time chasing and trying to process orders as well as managing customer late orders and canceled orders due to delays in shipping.

We also spend considerable time on material handling within and between our facilities.

We have had little free time to improve the process as we are too busy trying to get output.

Our people try to do the best they can but we see our margins getting lower as the competition looks at taking our business.

The average total standard cost is \$100

The following is the Total Product Cost breakdown:

| 1.4% | Product development as % of product cost |
|--------|--|
| 10.0% | Sales effort as % of product cost |
| 48.6% | Materials as % of product cost |
| 10.0% | Direct labor as % of product cost |
| 5.00% | Distribution cost as % of product cost |
| 22.0% | Overhead as % of product cost |
| 3.0% | Cost of Quality as % of product cost |
| 100.0% | Total Cost |

The following process information was collected recently...

| 0.5 | Process hours per chair average/typical |
|-----|--|
| 24 | Hours in day (all shifts) |
| 50 | Min batch quantity ordered by customers |
| 100 | New Product Introduction lead-time (days) |
| 1 | Order entry/sales LT (days) |
| 60 | Supplier lead-time (days) |
| 100 | Inventory of Raw material (days) |
| 25 | Manufacturing lead-time or cycle-time (days) |
| 30 | Inventory of work in process (days) |
| 4 | Distribution lead-time (days) |
| 60 | Inventory in distribution or finished goods (days) |
| 60 | Customer payment terms (days) |

Our ASK!

We have a Total cost of \$100 per chair and with a 20% margin sell for \$120 to stay competitive.

We would like to see our margin grow by another 10% without a price adjustment.

We are open to further questions and suggestions and are looking for your help.

Can you help?

Case study.....

The Case Study provided is the Mid-Term Assignment

You will have the opportunity to ask questions on the case study..

This is due as a written report and must be submitted to SLATE by each of you.

You can work in the small groups to prepare the written report

But, I also want each of you to independently write your own executive summary into the report as individuals.

A 10 minute powerpoint presentation is required by each team in the class. Date to be determined.

Each team member must present some part of the presentation.

I am expecting this to be a major effort and it should include a baseline map with all details provided...

Then an entitlement map showing how the process will be improved with short term savings. I need a minimum of 10% improvement in margin.

Then a long term benchmark map and savings that will justify capital expenditures. I am hoping this will further enhance profit margin and justify capital.

Please ensure you define all assumptions and the logic you used to make the improvements.

Please define the quality plan to contain and a plan to correct the massive pin and insert issue.

I am hoping you will apply the concepts we have discussed in class and I am expecting some innovative thoughts to show the improvements.