

# CASE ANALYSIS



MEAGAL STELPLAST: STEERING A NEW PATH



# OUTLINE

- Case Summary
- Current Structure
- Current Operational Strategy
- Challenges
- Plant Layout
- Process Design
- Possible Solution

# CASE SUMMARY

- An automobile horn manufacturing company, operating since 1992 and located in Mahipalpur, South Delhi, India.
- Products were made primarily for the replacement market. Demand is unpredictable although higher demand in post monsoon months (August to September) as horns tend to get damaged during the rains.
- Production of 15,000 horns per month. On an average, out of total production/month, 20% were branded as “MSL” and the remaining for other brand names. There is no difference between both except packaging and engravings.
- Made to order for stock. Branded horns are sold for INR200, against INR150 for MSL
- Two models of horns (Classic Hero Honda 90 dia. and Mithu AC 72 dia.) account for 80% of total production.
- MSL enjoyed the trust of its employees and had one of the lowest attrition rates. Over the years, it improved its product and developed a network of reliable suppliers.
- Company has available spare space to expand.
- 16 to 18 % growth is estimated in Indian auto component industry in 2011-2012, the replacement demand was expected to grow at a slower rate due to cheaper Chinese imports.
- MSL estimated that it would grow at 14% as the demand for horns in India would be 15 million units in 2012-2013.

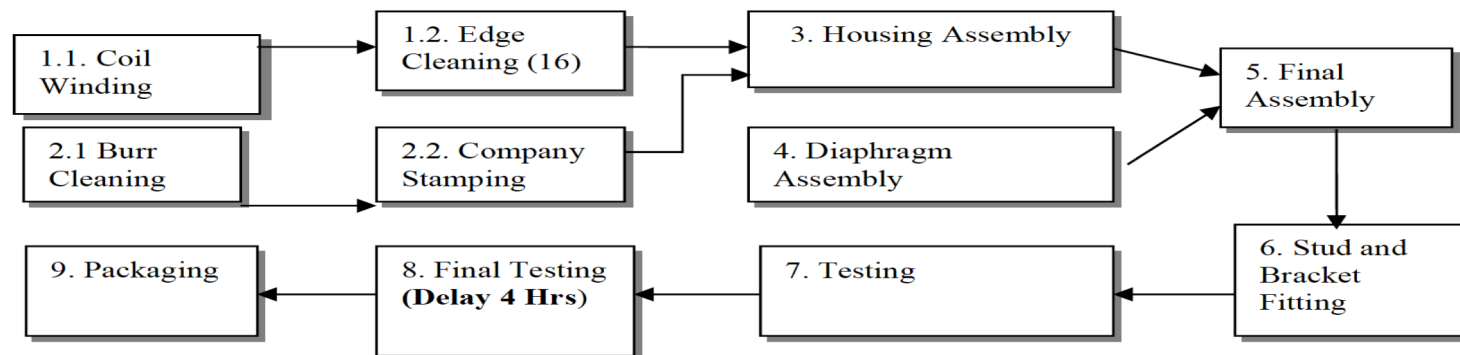
# CURRENT STRUCTURE

- **Organizational Structure** – Small organization, primarily, centralized decision model where owner is taking the decisions and others are following it. Any other people are not having any say in decision making.
- **Suppliers** – A network of reliable suppliers
- **Competitors** – MSL had about 10 competitors (small and medium enterprises (SMEs)) manufacturing horns for the replacement market in Delhi
- **Customers** – Mostly replacement market. Out of total production/month, 20% were branded as “MSL” and sold directly and the remaining for other brand names. There is no difference between both except packaging and engravings.

# CURRENT OPERATION STRATEGY

- Made to order policy due to uneven demand.
- Inventory on an average was maintained for 3000 horns. When the inventory fell below 500, order of 3000 horns were placed.
- One of the main components Copper wire was maintained as per requirements
- Manual Maintenance of orders, invoices, inventory and BOM.
- New workers were paid on piece rate basis. Old workers were paid on fixed monthly basis.
- 2 workers fixed for testing & rest 10 workers divided on 2 workbenches on rotation. The plant works 26 days a month, nine hours per day. Lunch break for 30 minutes and 2 tea breaks of 10 minutes each.
- Initial testing as soon as the horn was assembled, final Testing will be after 4 hours of assembly.

**EXHIBIT 6: PROCESS FLOW DIAGRAM**



Source: Created by authors.

# CHALLENGES

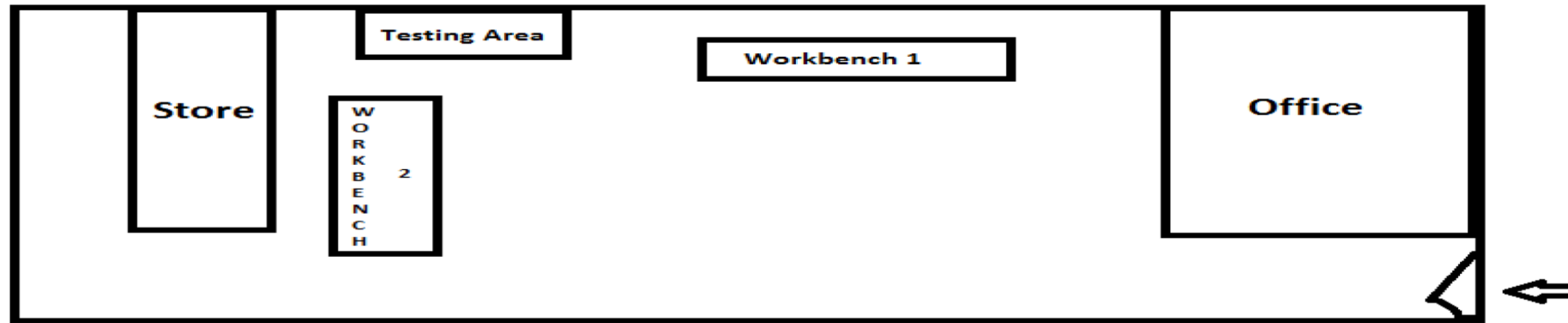
- The process is unorganized and not well laid out. Production is based on customer orders. Demand & Forecasting tools are not being used
- Manpower utilization is not optimal. Everybody does everything
- Material management as seen from the video was unorganized and cluttered. The assembly parts were haphazardly laid out. This obviously leads to poor material management and pilferage
- There was a empty land beside the plant which was unutilized. Due to building and land regulations tightening in the region, the idea of shifting the plant outside Delhi was proposed, but MSL needs to decide whether to expand out of Delhi or not ?
- In 2010, MSL had procured many automation devices, such as: Coil winding machines, Automatic fastening machines test benches but workers were reluctant to use them and continued with the old practices as workers were hesitant to change which led to an environment of mistrust.
- No formal production standards - difficult to evaluate its performance beyond the periodical financial reports.
- The horns had a warranty period of three years. 10% of the products were returned during this time.
- Due to such governmental social schemes as the Mahatma Gandhi National Rural Employment Guarantee Act (MNREGA) The MNREGA scheme guaranteed 100 days' employment to the rural population, hence the availability and retention of workers had become difficult.
- In 2011, the company doubled its manpower in which it hired six more workers – total of a dozen, and paid on a piece rate basis while the older ones were paid monthly wages which could be a cause of disparity. The number of horns produced by the newly hired workers was around 8% higher than that of the older workers.

# CHALLENGES

- The company wanted to enter the original equipment market (OEM) steady flow of orders. The basic pre-requisite for supplying to OEMs was to get certificate. Since there was no need for such certification for the replacement market, MSL was in a fix whether it should put up a separate plant for the OEM market or increase the capacity of its existing operations after obtaining certification.

# PLANT LAYOUT

EXHIBIT 7: LAYOUT OF THE PLANT



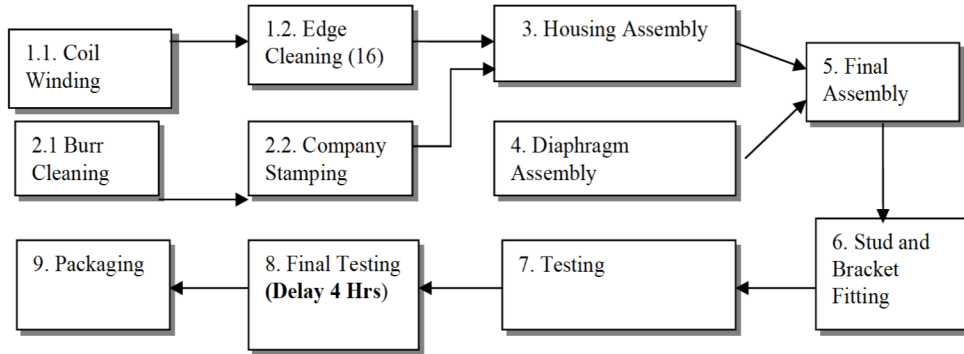
*Workbench 1 = Workers on monthly wages.  
Workbench 2 = Workers on per piece basis.  
Source: Created by authors.*

- There were 12 workers in the factory, including two skilled testers.
- The assembly was done in a batch mode, using a disconnected worker-paced system.
- The plant works 26 days a month, nine hours per day. The workers had a lunch break of 30 minutes and two tea breaks of 10 minutes.
- A lot of unused land can be seen from the pictorial representation.
- Workbench 1 consist of older fixed wages employees and workbench 2 consist of new employees working on per piece basis



# PROCESS DESIGN

EXHIBIT 6: PROCESS FLOW DIAGRAM



Source: Created by authors.

	Operation	Estimated Operation Time (minutes) Based on interview with supervisors
<b>1</b>	<b>Coil Assembly</b>	<b>2</b>
1.1	Coil Winding	
1.2	Edge Cleaning	
<b>2</b>	<b>Housing Ready</b>	<b>2</b>
2.1	Burr Cleaning	
2.2	Company Stamping	
<b>3</b>	<b>Housing Assembly</b>	<b>5</b>
3.1	Coil Setting + Coil Patti	
3.2	Terminal Blocks + Brass Terminal	
3.3	Point Fitting	
3.4	Point Patti + Ghora Patti (to increase strength of point patti)	
<b>4</b>	<b>Diaphragm Assembly (Armature)</b>	<b>2</b>
4.1	Pin, Diaphragm, Washers, Sound plate Arrangement	
4.2	Tightening of Diaphragm	
<b>5</b>	<b>Final Assembly</b>	<b>4</b>
5.1	Diaphragm assembly fixed with nuts and bolts on Housing Assembly along with Ring/Jali (Loose nuts and bolts)	
5.2	The nuts and bolts are fastened	
<b>6</b>	<b>Stud and Bracket fitted on Final Assembly</b>	<b>2</b>
<b>7</b>	<b>Testing</b>	<b>4</b>
<b>8</b>	<b>Final Testing after 4 hrs</b>	<b>2</b>
<b>9</b>	<b>Packaging</b>	<b>5</b>
9.1	Sticker	
9.2	Cleaning	
9.3	Polybag	
9.4	Horn Box	
9.5	Master Pack of 30 Horns	

- Bottleneck: Housing Assembly and Packaging (5 min)
- Final testing performed 4 hours (240 min) after the unit is test ready
- Working Time: 9 hrs in 1 day. Breaks: 30 min (Lunch), 20 min (2 tea breaks) Effective Production time/Day: 490 mins
- Each individual process step time taken based on inputs from supervisors.
- Average time for end to end production of one unit – 21 Mins
- Final testing and packaging – 7 mins
- Total time for one unit production – 4 hour 28 minutes.

# POSSIBLE SOLUTIONS

- The layout can be arranged in a C layout. This would not only improve efficiency but also lead to reduction of travel time. This would also address the problem of disconnected worker system.
- Hiring new workers and paying them on Piece per rate basis may also help in expansion. Hiring more workers will reduce cycle time and bottleneck which will improve the production capacity.
- MSL can adopt batch production or assembly line production. This will increase the utilization of resources and increase the production.
- Training of employees: The workers need to be trained well on the new technology; this would help increase the utilization of the system. Better machines could be deployed to assemble the horns, as it will be leaner with reduction of manual work and more standardization. Standardize the product to achieve economies of scale.
- Improve the formal production standards in company. They need to work on retraining resources. Final testing delay of four hour under simulated conditions can be improved using latest technology that can reduce the production time.
- In-process inspection during the product flow should be carried out for better quality production of horns and reduce defects.
- Workers need to be motivated to learn and adopt new technologies. From the discussion, it was understood that the workers are hesitant to change and are not very flexible. A lot of improvement can be achieved in this.
- The material management can be improved by giving each worker the number of parts required for the assembly. This would not only improve the material management but also reduce pilferage.
- As per my high level understanding the plant should take decision to go towards OEMs without buying any land. In case the demand is on higher end, then the shift can be made to the assembly line process, followed by expansion within the same plant.

**THANK YOU**

