Manufacturing Problem: Downtime

The mold handles station experiences an unplanned downtime of 20%. Can you still meet customer demand?
Manufacturing Solution: Downtime

The mold handles station experiences an unplanned downtime of 20%. Can you still meet customer demand?

Answer:

Yes, as shown by the Cycle Time / Takt Time chart.

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Manufacturing Problem: Availability

Management is considering sharing the Sharpen station with another value stream for two hours per day. What would your recommendation to management be?
Manufacturing Solution: Availability

Management is considering sharing the Sharpen station with another value stream for two hours per day. What would your recommendation to management be?

Answer:

Sharing the Sharpen station brings its availability very close to Takt Time, leaving little to no room for planned/unplanned downtime. It would be best to not share the Sharpen station as it’s currently configured.
Manufacturing Problem: OEE

1. The mold machine has been measured as being able to make 1100 good scissors per day. Calculate its OEE.

2. In the absence of “good parts” measurements, set the OEE for all other equipment to 85%. Check the resulting capacity and see if customer demand can be met.
Manufacturing Solution: OEE

1. The mold machine has been measured as being able to make 1100 good scissors per day. Calculate its OEE.

2. In the absence of "good parts" measurements, set the OEE for all other equipment to 85%. Check the resulting capacity and see if customer demand can be met.

Answer:

1. The OEE for Mold Handles is 78.57%. The customer demand cannot be met as shown in the Capacity Chart at Sharpen and Make Box stations.

2. The OEE for Mold Handles is 78.57%. The customer demand cannot be met as shown in the Capacity Chart at Sharpen and Make Box stations.
Manufacturing Problem: Stations

The Sharpen activity actually has two stations, each with the data shown on the map. Correct the map by adding a second station and compare cycle time per item to takt time for that activity.
The Sharpen activity actually has two stations, each with the data shown on the map. Correct the map by adding a second station and compare cycle time per item to takt time for that activity.

Answer:
The cycle time per unit has decreased as shown on the Cycle Time / Takt Time chart.
Manufacturing Problem: Changeover

The product family consists of four sizes of scissors, necessitating changeovers at the Mold Handles activity. Each changeover takes 60 minutes. Is there adequate capacity on the Mold Handles activity to meet demand for each scissor size every day?
Manufacturing Solution: Changeover

The product family consists of four sizes of scissors, necessitating changeovers at the Mold Handles activity. Each changeover takes 60 minutes. Is there adequate capacity on the Mold Handles activity to meet demand for each scissor size every day?

Answer:

Just barely, as shown on the Cycle Time / Takt Time chart.
Problem: It's been decided that overtime will be used to avoid the bottleneck at the Sharpen activity. How many hours of overtime would you recommend authorizing? Is there sufficient inventory buffer in front of sharpening to allow this?
Problem: It's been decided that overtime will be used to avoid the bottleneck at the Sharpen activity. How many hours of overtime would you recommend authorizing? Is there sufficient inventory buffer in front of sharpening to allow this?

Answer:

Four hours of overtime would be enough, and in that time the machine could run 240 parts so there is more than enough inventory buffer in front of the Sharpen activity.
Manufacturing Problem: Lead Time

Problem: A system of more frequent supplier and customer deliveries has been recommended (once daily) with an inventory of two days at raw materials and finished goods, and a max WIP at any position of half a day. How will this improve lead times?
Manufacturing Solution: Lead Time

Problem: A system of more frequent supplier and customer deliveries has been recommended (once daily) with an inventory of two days at raw materials and finished goods, and a max WIP at any position of half a day. How will this improve lead times?

Answer:

The Lead Time is reduced from twenty days to just above five and a half days.
Manufacturing Problem: Scrap

Problem: An inspection as part of the Assemble activity indicates 10% scrap at this point. Is there still enough capacity to meet customer demand?
Manufacturing Solution: Scrap

Problem: An inspection as part of the Assemble activity indicates 10% scrap at this point. Is there still enough capacity to meet customer demand?

Answer:
The Scrap loss at the Mold Handles activity reduces Takt Times upstream such that there is inadequate Capacity.
Manufacturing Problem: Cost

Problem: The cost of blanks at Atlas is $5 per item. Mold Handles add $2.50, Sharpen adds $1, Assemble adds $0.5, and Make Box adds $0.05. Each of the transport legs adds $0.2 per item. Calculate and visualize the added cost and cumulative cost through the value stream.
Manufacturing Solution: Cost

Problem: The cost of blanks at Atlas is $5 per item. Mold Handles add $2.50, Sharpen adds $1, Assemble adds $0.5, and Make Box adds $0.05.

Each of the transport legs adds $0.2 per item. Calculate and visualize the added cost and cumulative cost through the value stream.

Answer:

[Diagram showing the value stream analysis with costs and times summarized for each process step: Blanks, Molded Blanks, Sharpen, Drilled Blanks, Assemble, Make Box, and Scissors.]

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Manufacturing Problem: Annual Carrying Cost

Problem: You want to estimate the annual carrying cost of the inventory in the plant. You know that the Cost of Capital is 8%, Inventory Obsolescence is 1%, and Inventory Insurance Cost is 2%.

How much would you save annually in carrying costs if you reduced the finished goods inventory to 3000 items in conjunction with more frequent customer deliveries? 

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Manufacturing Solution: Annual Carrying Cost

Problem: You want to estimate the annual carrying cost of the inventory in the plant. You know that the Cost of Capital is 8%, Inventory Obsolescence is 1%, and Inventory Insurance is 0.5%. How much would you save annually in carrying costs if you reduced the finished goods inventory to 3000 items in conjunction with more frequent customer deliveries?

Answer:

The current state annual inventory carry cost is 17.92 K$.

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Manufacturing Solution: Annual Carrying Cost

Problem: You want to estimate the annual carrying cost of the inventory in the plant. You know that the Cost of Capital is 8%, Inventory Obsolescence is 1%, and Inventory Insurance Cost is 0.2%. How much would you save annually in carrying costs if you reduced the finished goods inventory to 3000 items in conjunction with more frequent customer deliveries?

Answer:

The future state annual inventory carry cost is 12.37 K$, so the annual cost difference is a 5.55 K$ savings.
**Quick Manufacturing Stencil**

*Quick Manufacturing* is one of eVSM’s *Quick Stencils* and supports plant level mapping of discrete parts and assemblies in industries like automotive, electro-mechanical, and medical equipment. It provides easy, fast, and focused mapping as shown below:

Quick Manufacturing is actually a compatible set of 3 stencils as shown below.

**Sketch:** Simple sketch shapes, no data blocks

**Lite:** + data blocks + equations + charts ideal for most maps

**Pro:** + cost, space, energy concepts that increase map leverage.

Quick stencils are popular because of their capability and also because of the excellent deployment materials available. These include example maps, publications, and learning options.

4x mapping speed and quantified improvements with a well designed set of icons, variables, macro shapes, equations, and charts.

The technical concepts addressed by the Quick Manufacturing stencil are shown below.

- Cycle Time
- Multiple Stations
- Qty Per Cycle
- Takt Time
- Utilization
- Transfer Lot Size

**Lead Time**

**- VA & NVA Time**
**- Queues and Delays**
**- Process Lead Time**

**Lead Time Chart**

**Capacity**

**- Space Utilization**
**- Energy Efficiency**

**Quick Manufacturing**

**Resources**

**- Shared Resource**
**- Resource Utilization**
**- Resource Bottlenecks**
**- Resource Allocation**

**Resource Balance Chart**

**OEE**

**- Map Linkage**
**- Side Calculations**

**Effective Capacity Chart**

**Cost**

**- Inventory Holding Cost**
**- Activity Based Cost**
**- Material Cost**
**- Resource Cost**

**Cumulative Cost Chart**

An example map drawn in Quick Mfg is shown overleaf.