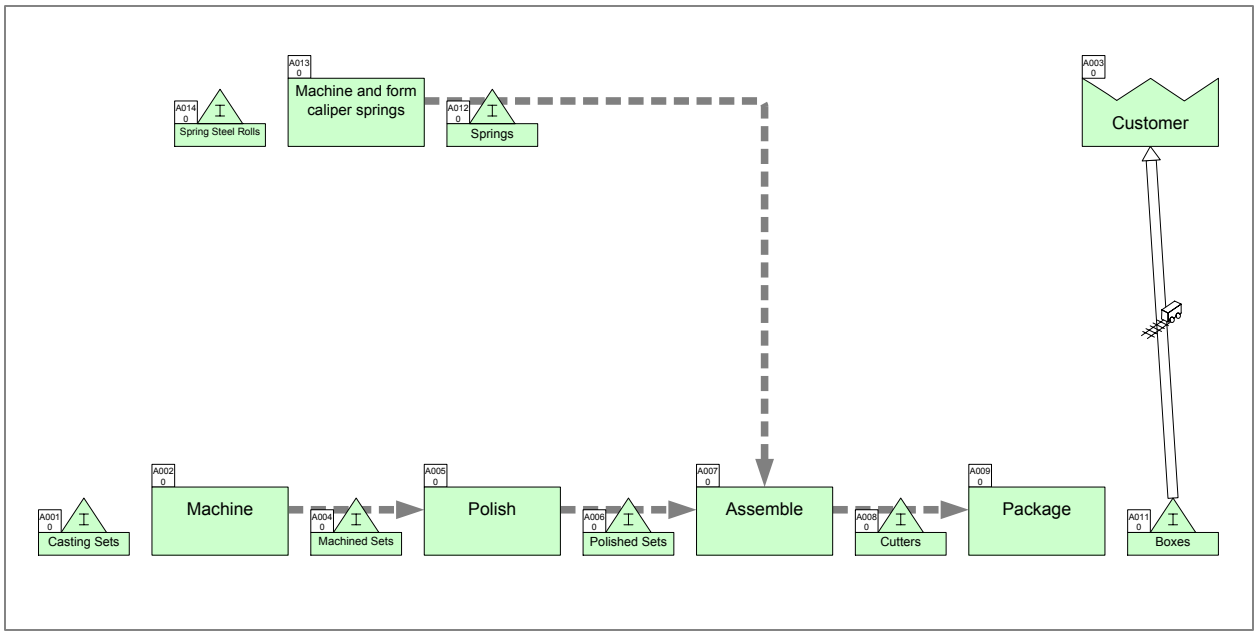
Quick Manufacturing Tutorial

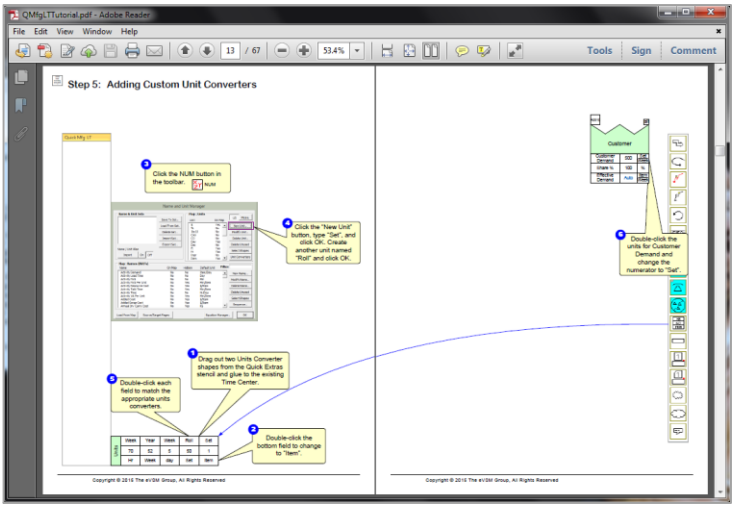
This tutorial will guide you through the steps to draw a simple map, perform common calculations, and plot charts using the Quick Manufacturing stencil.



Viewing/printing eVSM Tutorial:

This tutorial is designed for two page layout. If printing, you will need double-sided print.

For on-screen viewing, save the PDF file to your PC and then open it in Acrobat Reader (not in a web browser). In the Acrobat menus, click “View>Page Display", make sure “Show Cover Page in Two Page View” is checked and then select "Two Page View”.



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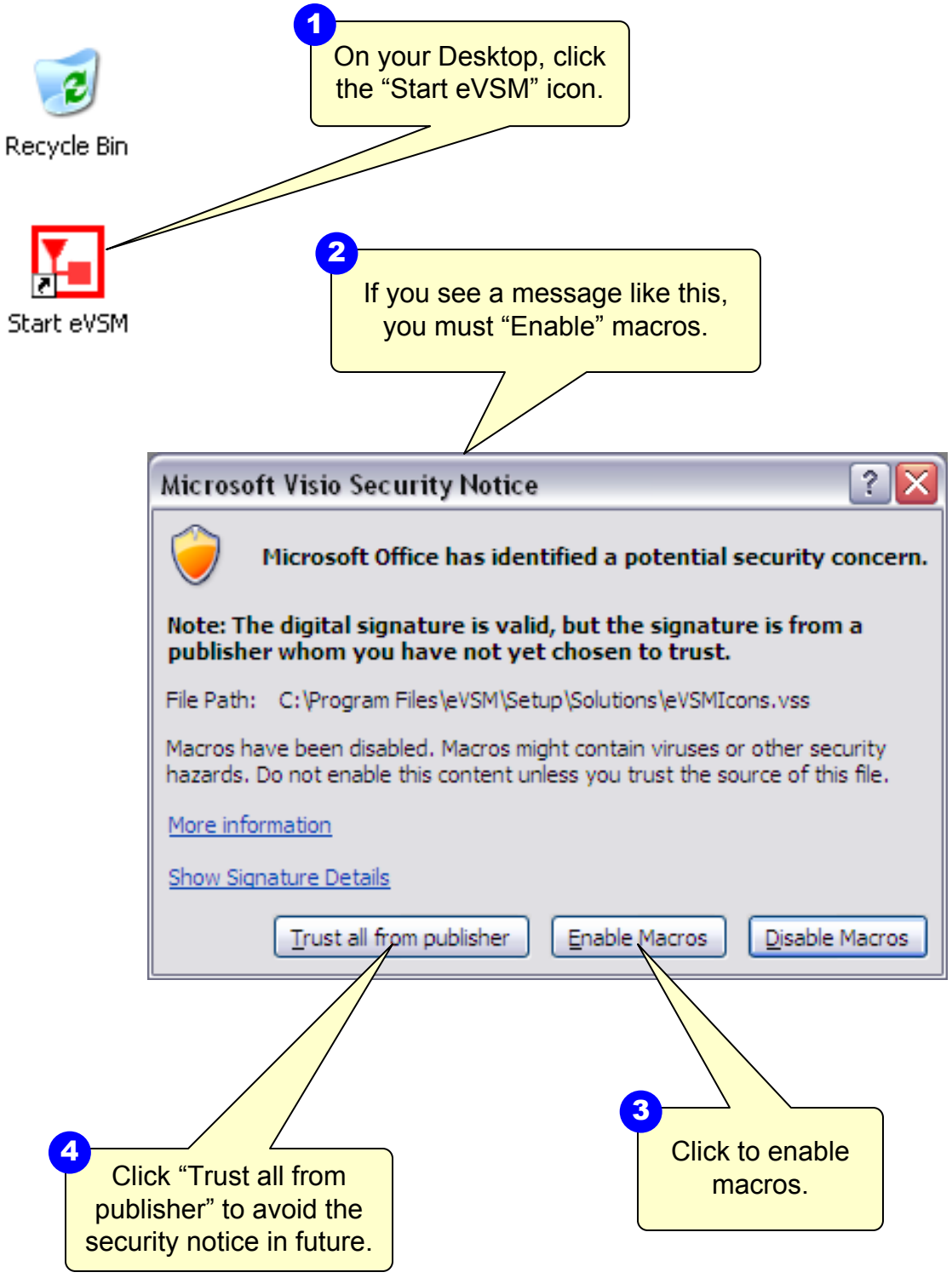
Step 1: Start eVSM



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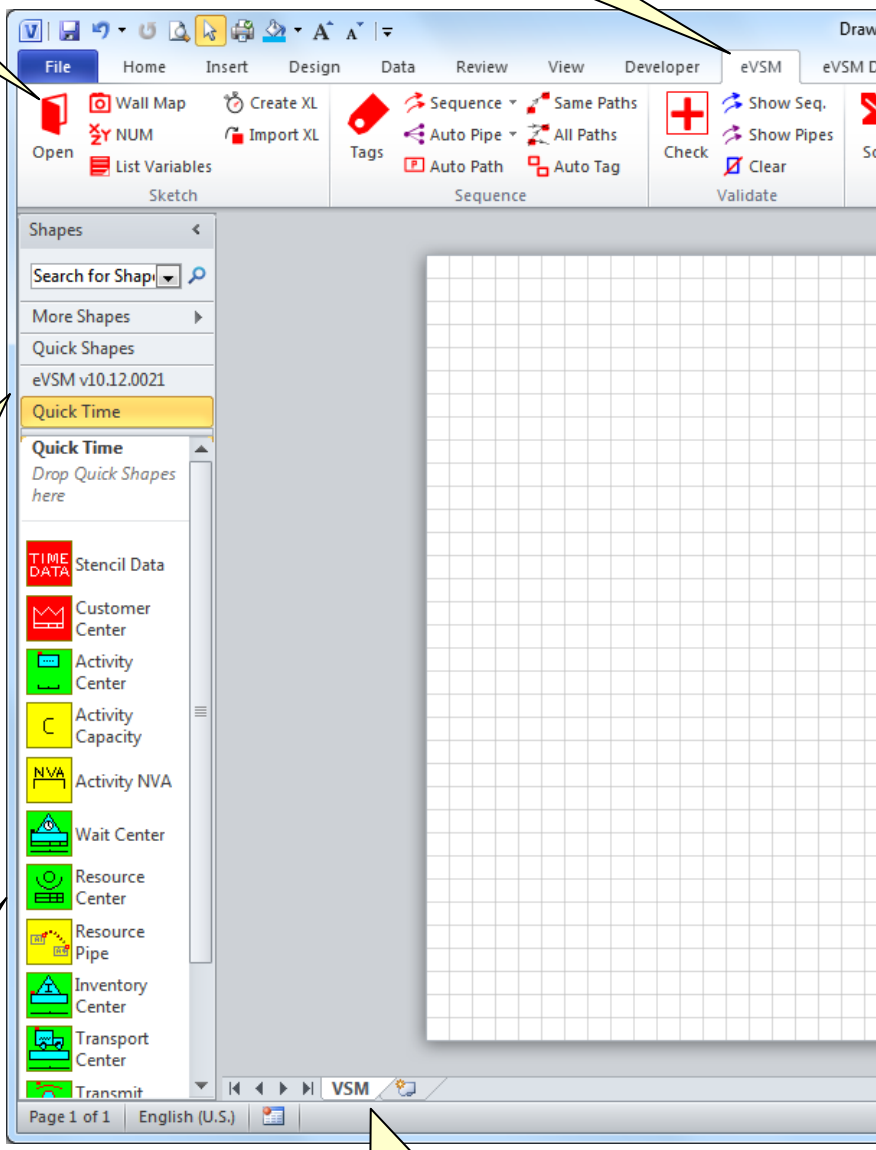
The eVSM Environment

A new map is initiated by selecting your application area from the "Open" button. Only the stencils required for your selected application area will open on the left side.

eVSM adds this toolbar to Visio as well as the stencils on the left and right. If the eVSM toolbar disconnects, click File>Save As and save the file, close the file, then re-open it. This tip can used for other crashes in eVSM.



The left hand side has the Quick eVSM stencils which are optimized for specific application areas such as manufacturing vs office vs healthcare.

The Quick stencils contain macro shapes which are often collections of individual eVSM shapes with pre-built names, units, equations, and other properties.

A Visio file can have multiple pages which are accessed with these tabs. Each page gets locked to a chosen eVSM application and then not be used for other applications.

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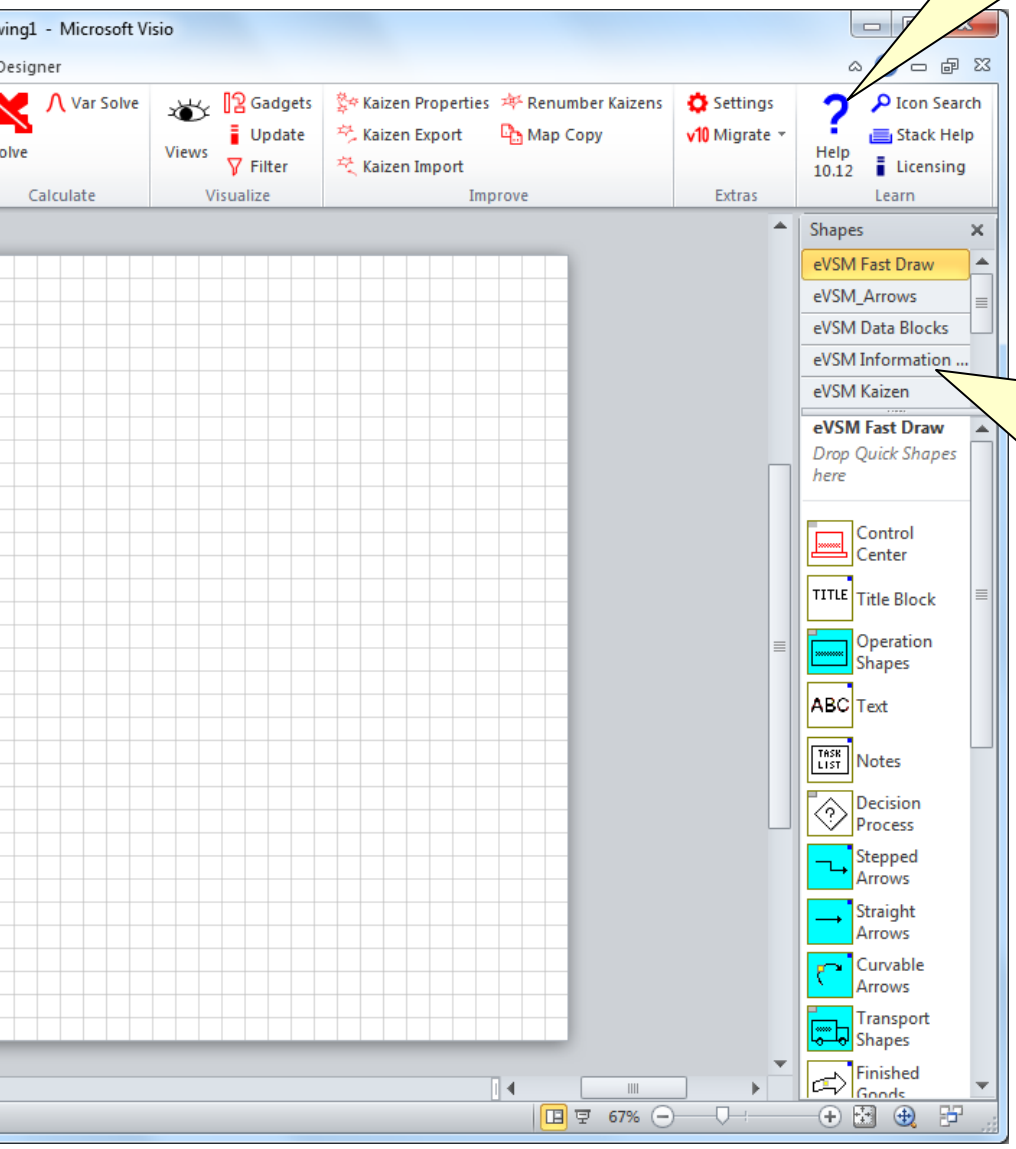
Hover over each button in the eVSM Toolbar to learn what it does. Detailed help and tutorials are available at the eVSM help site which can be accessed via this button.



The stencils on the right stencils contain individual base eVSM icons. These are organized into separate stencils (arrows, data, etc.) to make it easier to find shapes.

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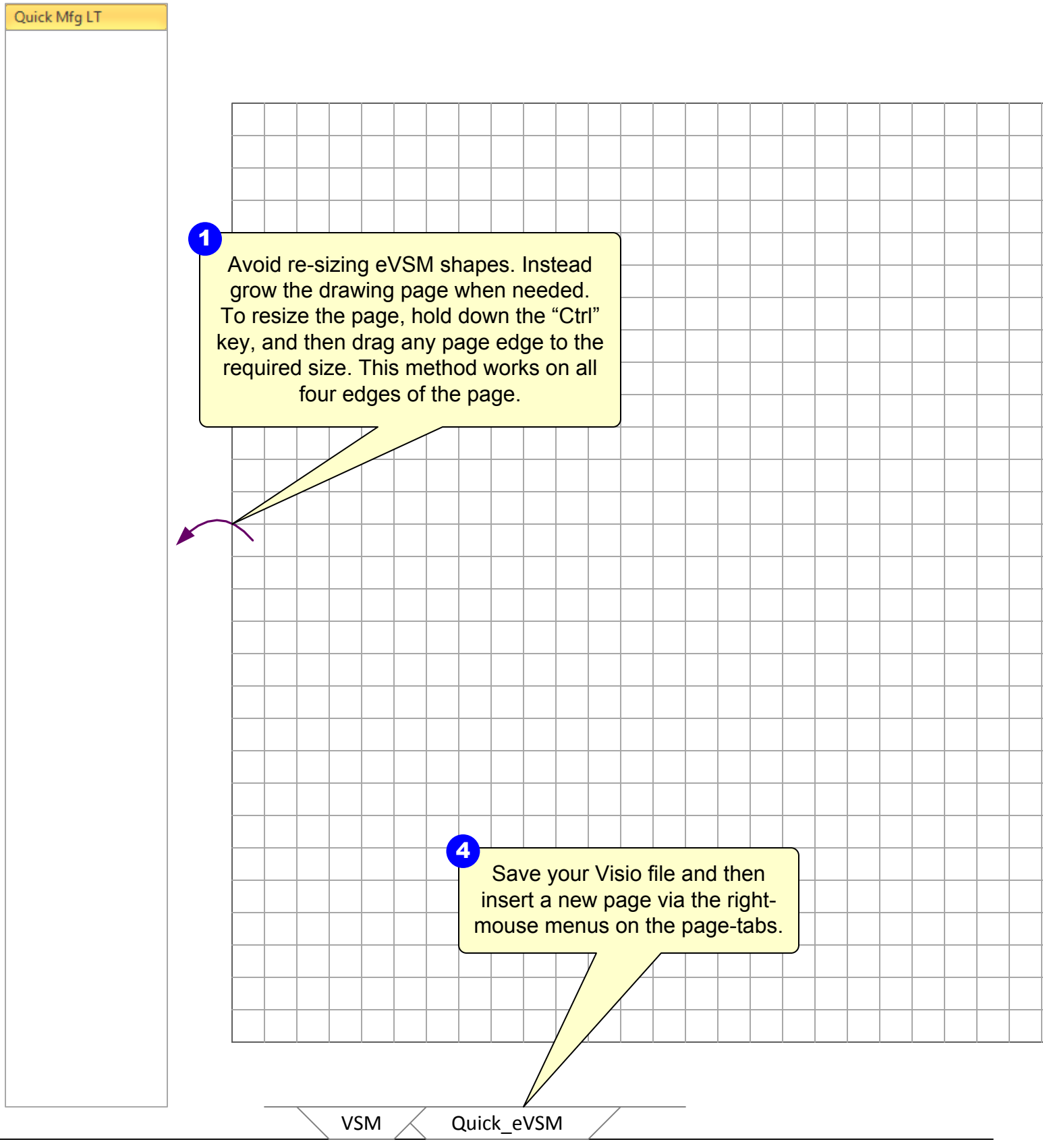
Step 2: Learn eVSM Basics



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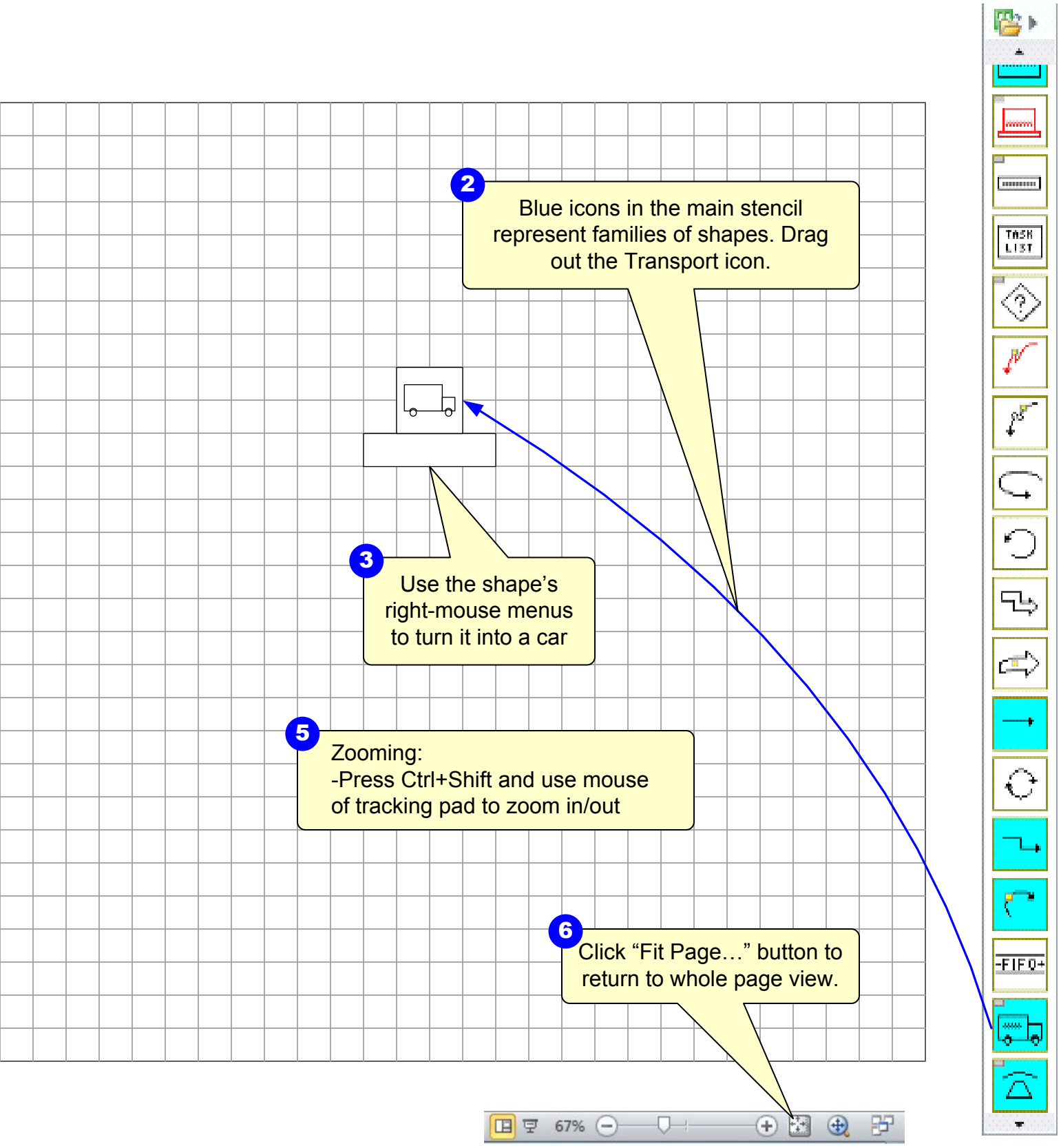

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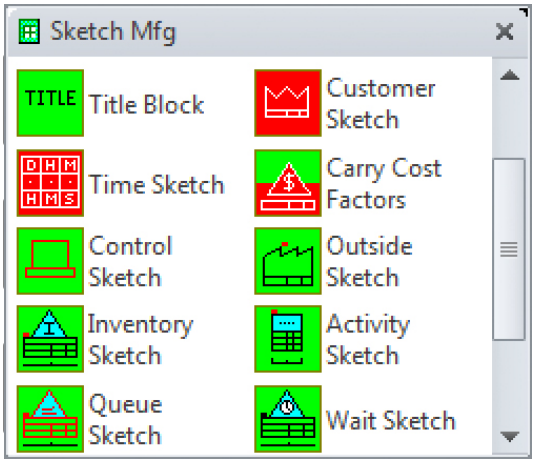
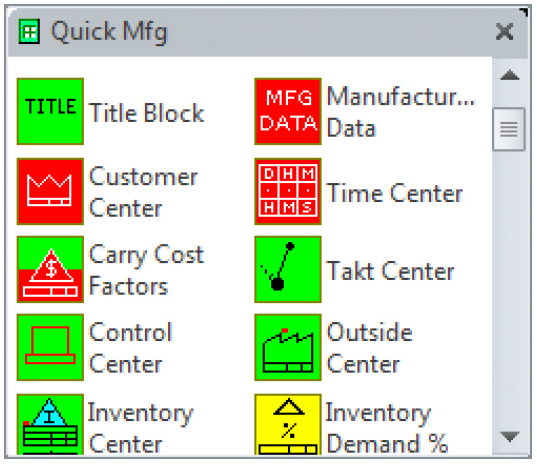
Quick Mfg Stencils Overview

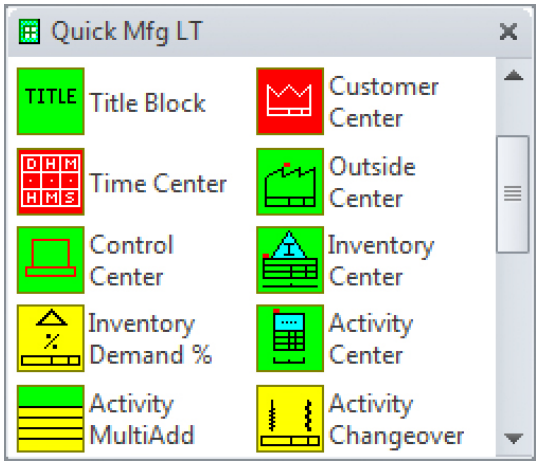
Quick Manufacturing has three stencils.



The Sketch stencil allows you to capture the value stream flow with no data shapes. Data shapes can later be added automatically via right mouse button menus.



The full Quick stencil contains all of the macro shapes available in Quick manufacturing. Includes the full set of add-on (yellow icons) calculations.



The LT stencil contains all the flow shapes but only a small subset of the add-on (yellow icons) calculations. Great for new users and for users who don't need the advanced calculations.

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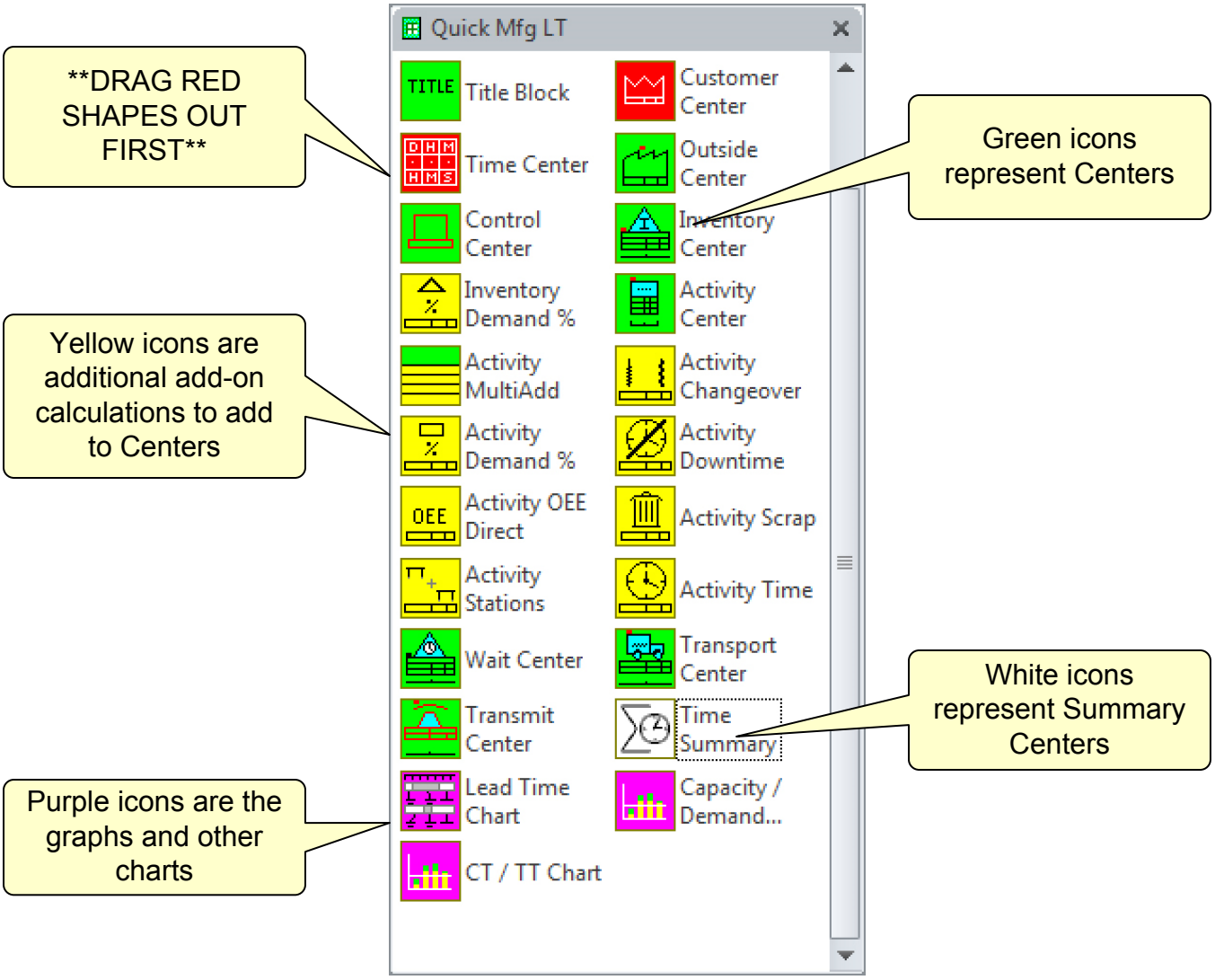
Quick Stencil Icon Colors

Below is an overview of the Quick Mfg stencil shapes.



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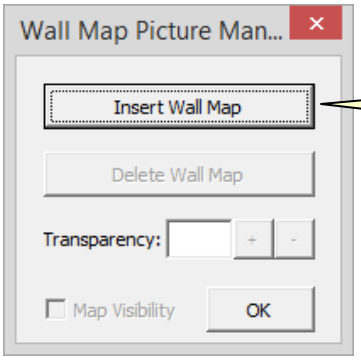
Step 3: Using the wall map sketcher

Often value stream maps are started on walls or paper. Converting a hand-drawn map can be tedious and error prone. An easy way to handle this is to take a clear picture of the map, import it into eVSM and then draw the electronic map, directly on to of the picture. This page shows how the eVSM Wall Map function can help with this. You can use a picture of any map to learn this step, if you don't have one, download a copy from:

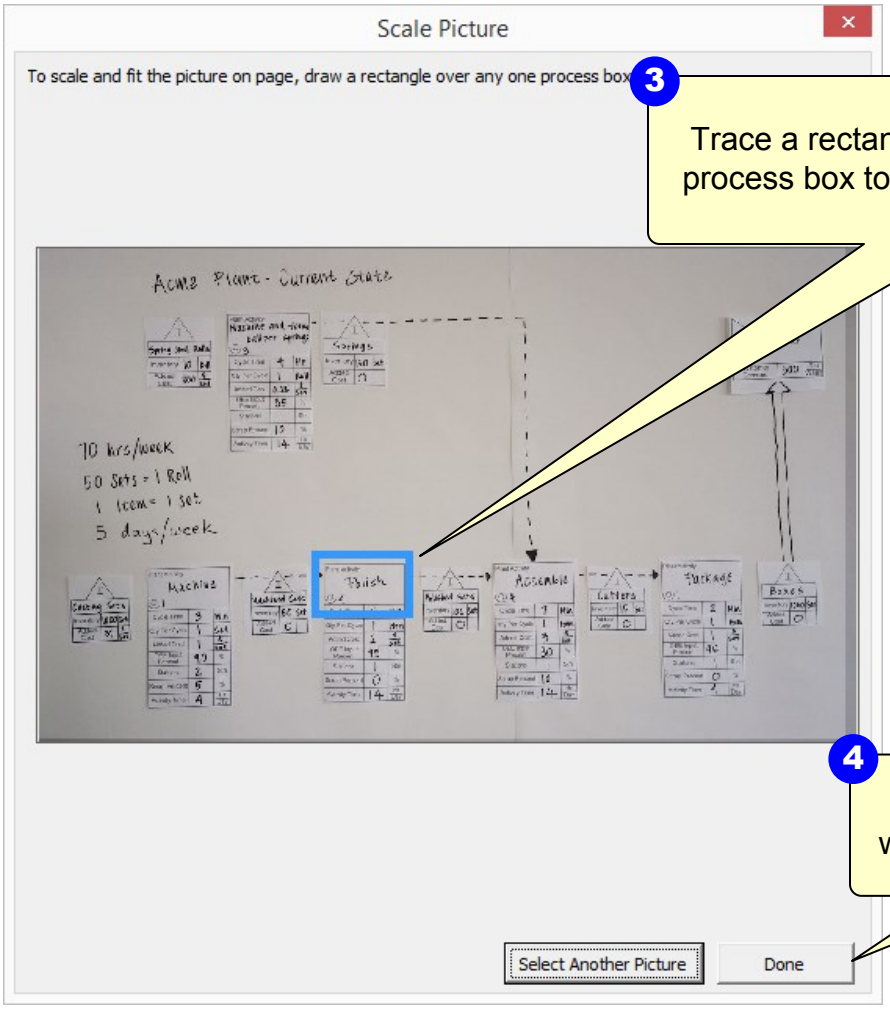
http://www.evsm.com/wallmap

Quick Mfg LT

1 Click the Wall Map button in the toolbar to import a wall map picture into eVSM. Wall Map



2 Click the Insert Wall Map button to browse for the image on your computer.



3 Trace a rectangle over any one process box to scale the picture.

4 Click Done when finished.

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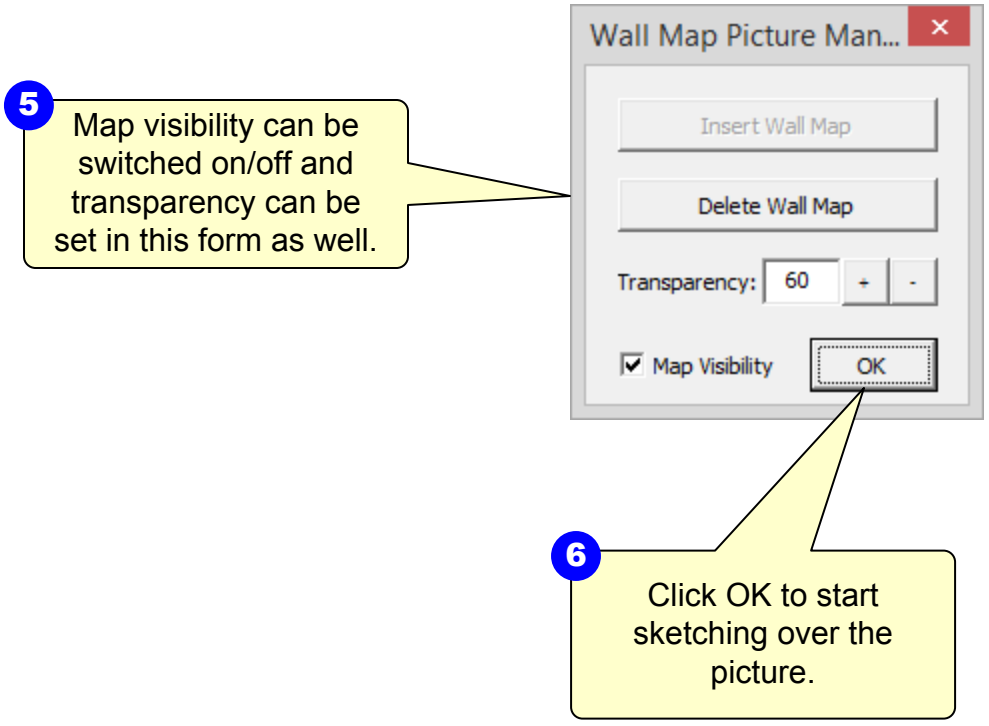

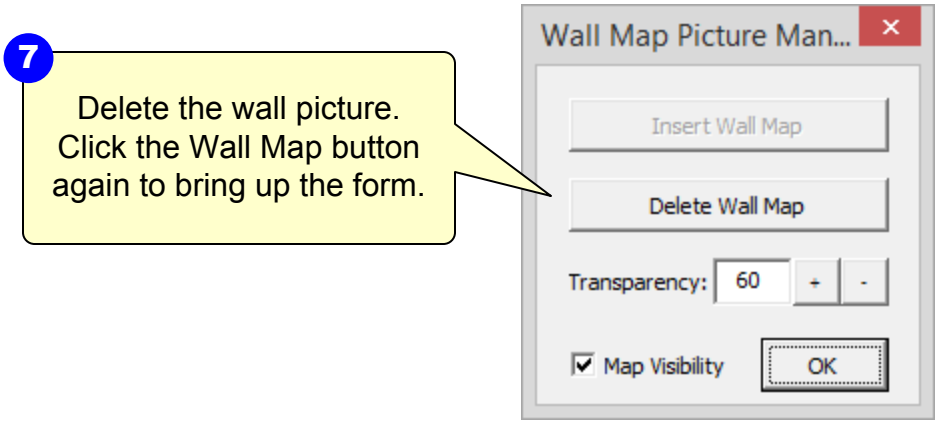

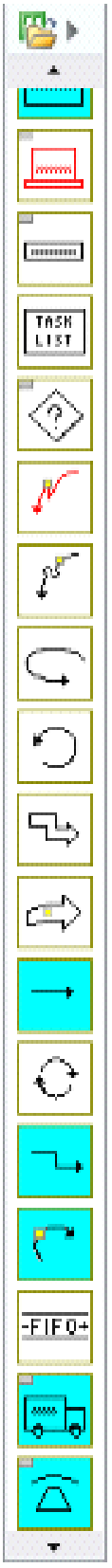

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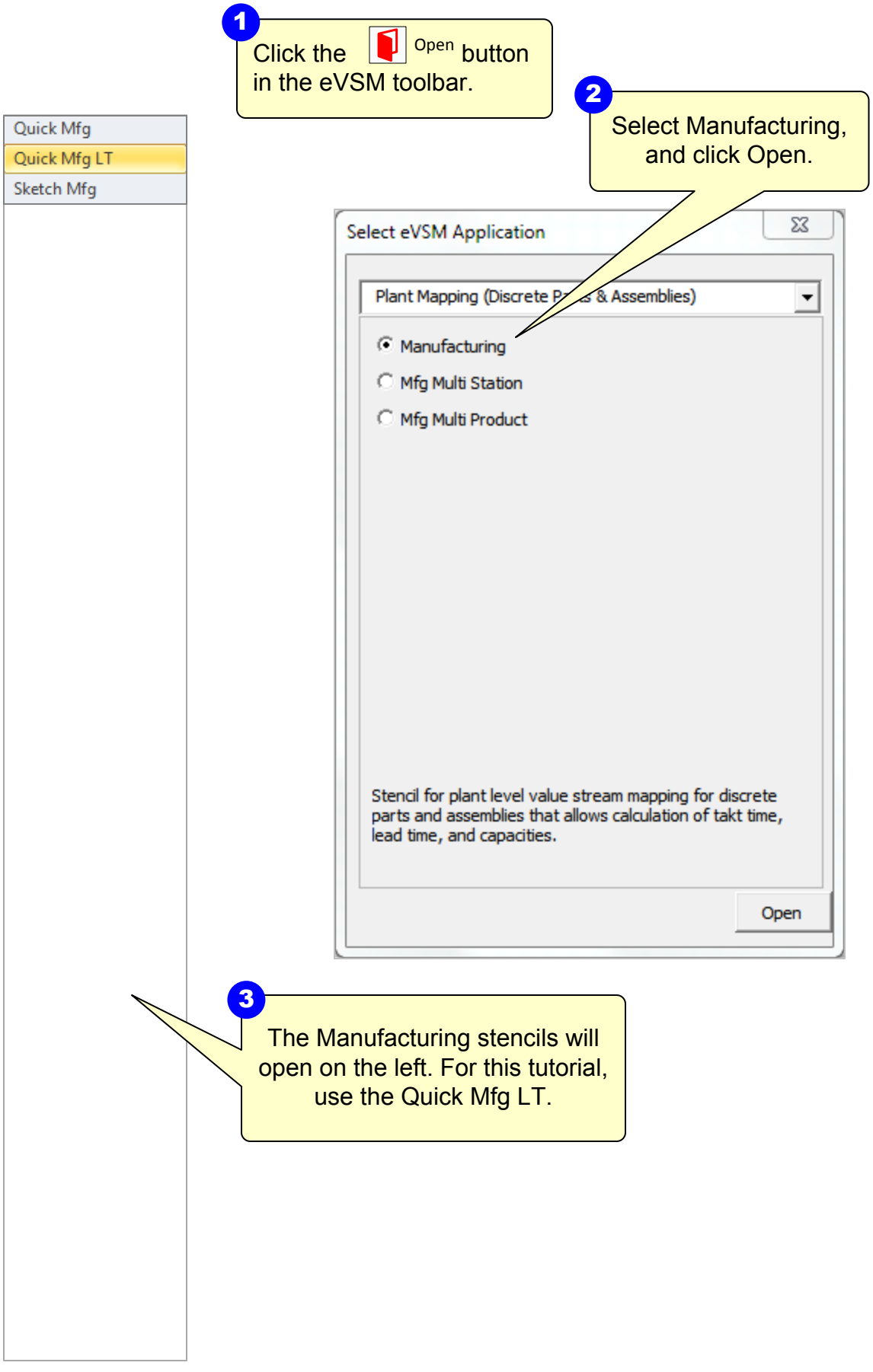
Step 4: Initiate the map for Quick Manufacturing LT



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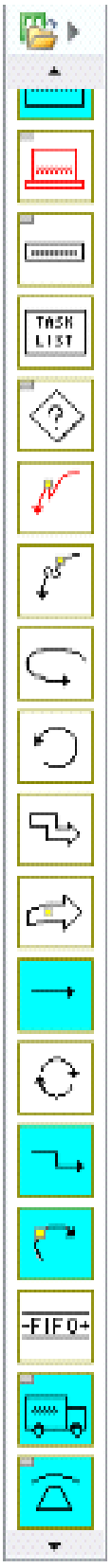

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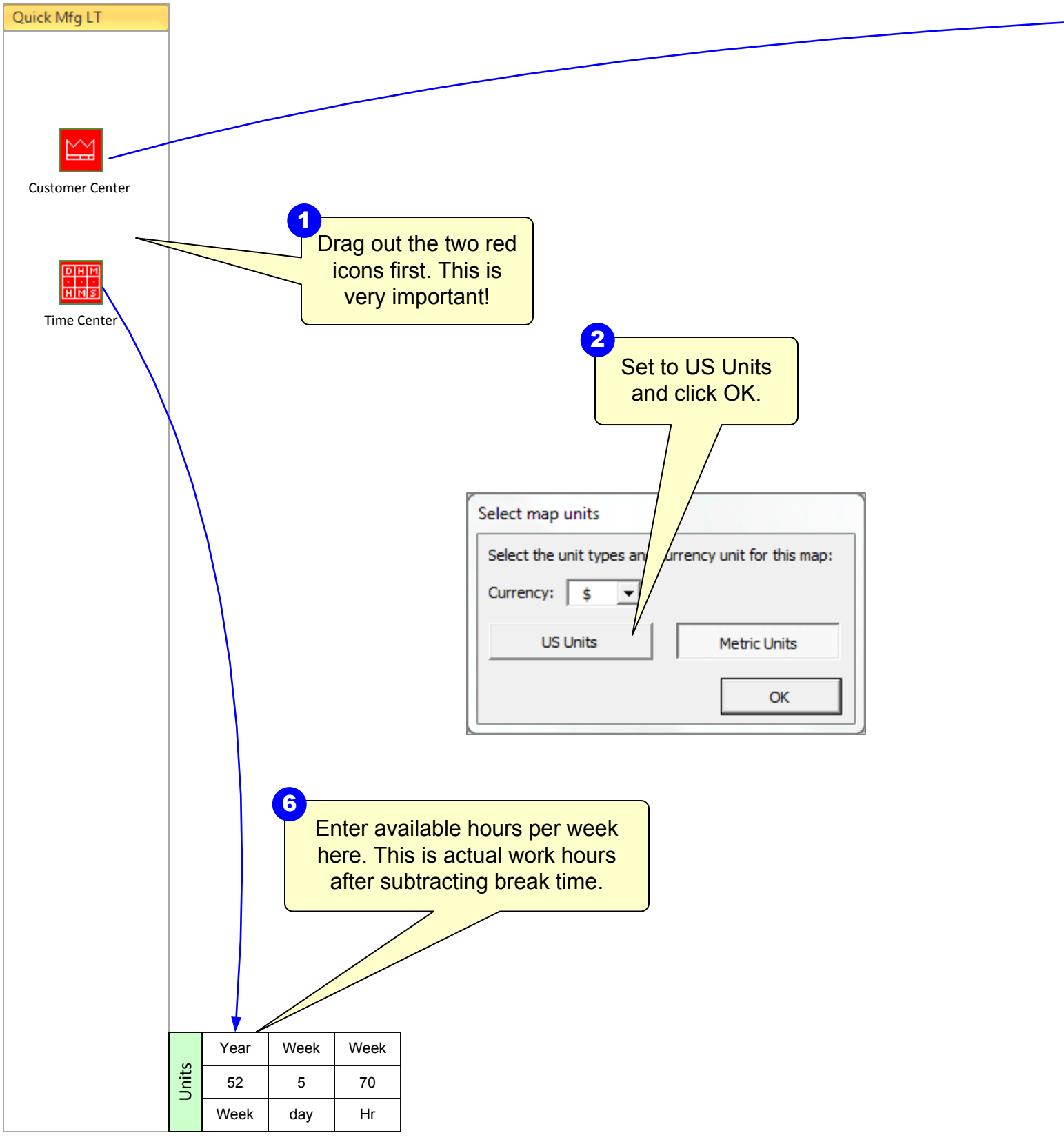
Step 4B: Initiate the map for Quick Manufacturing LT



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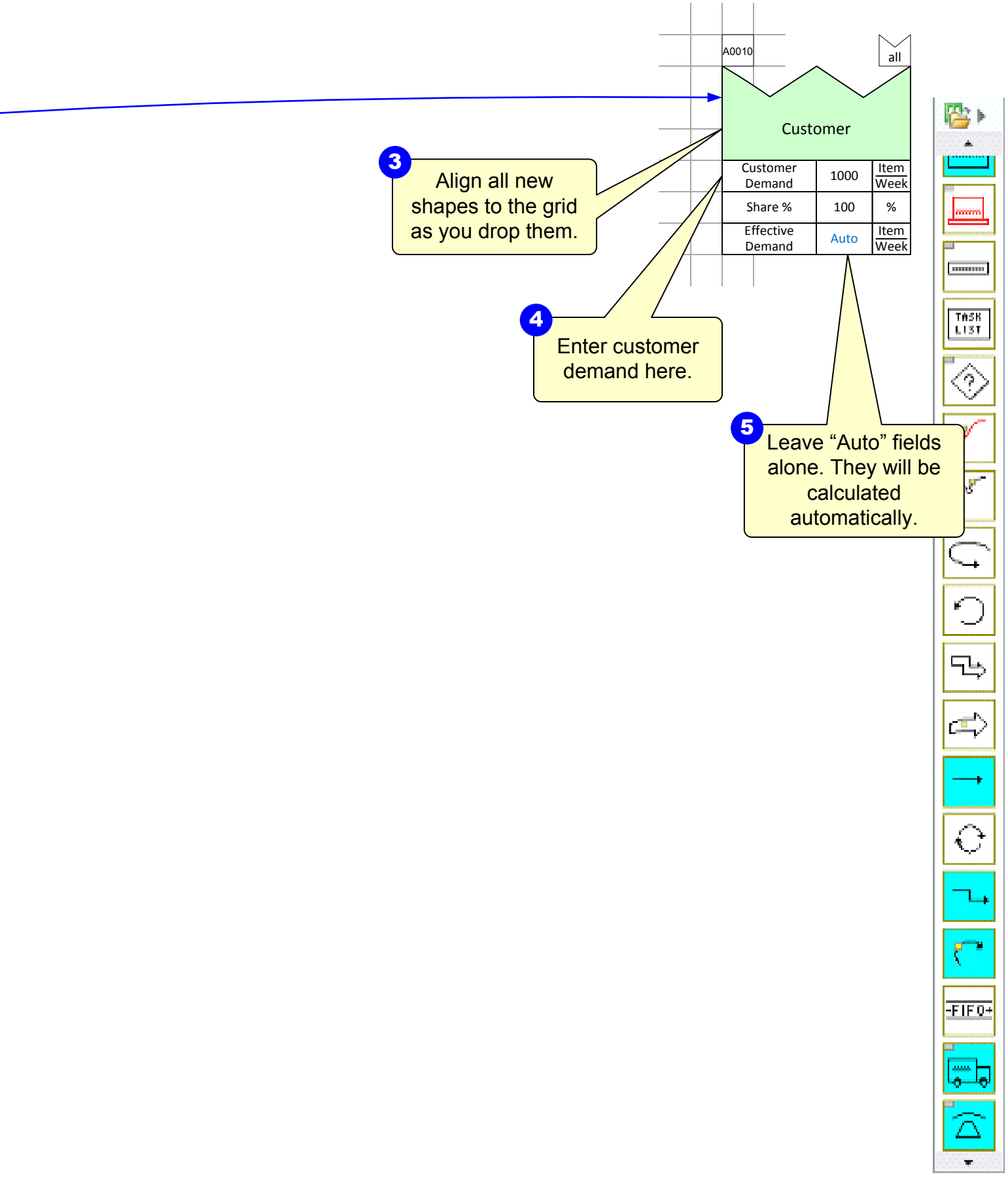

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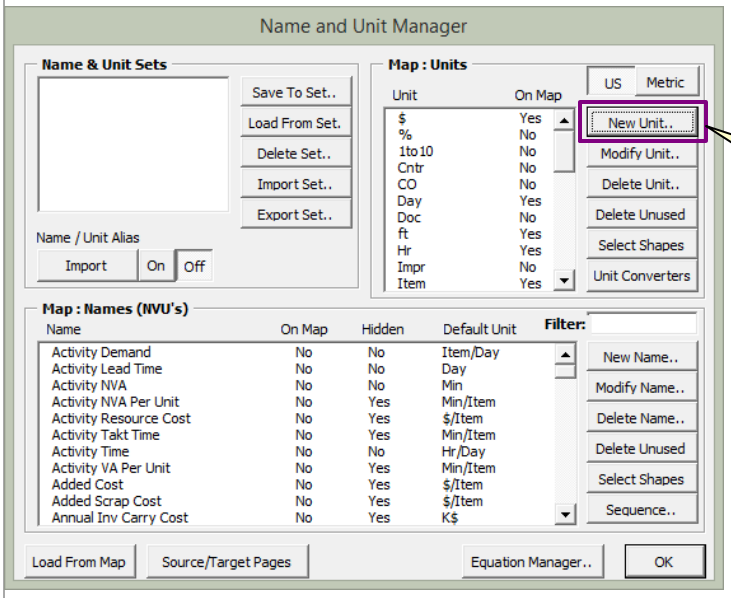
Step 5: Adding Custom Unit Converters

Quick Mfg LT

3 Click the NUM button in the toolbar. NUM



4 Click the "New Unit" button, type "Set", and click OK. Create another unit named "Roll" and click OK.

5 Double-click each field to match the appropriate units converters.

Units	Year	Week	Week	Roll	Set
	52	5	70	50	1
	Week	day	Hr	Set	Item

2 Double-click the bottom field to change to "Item".

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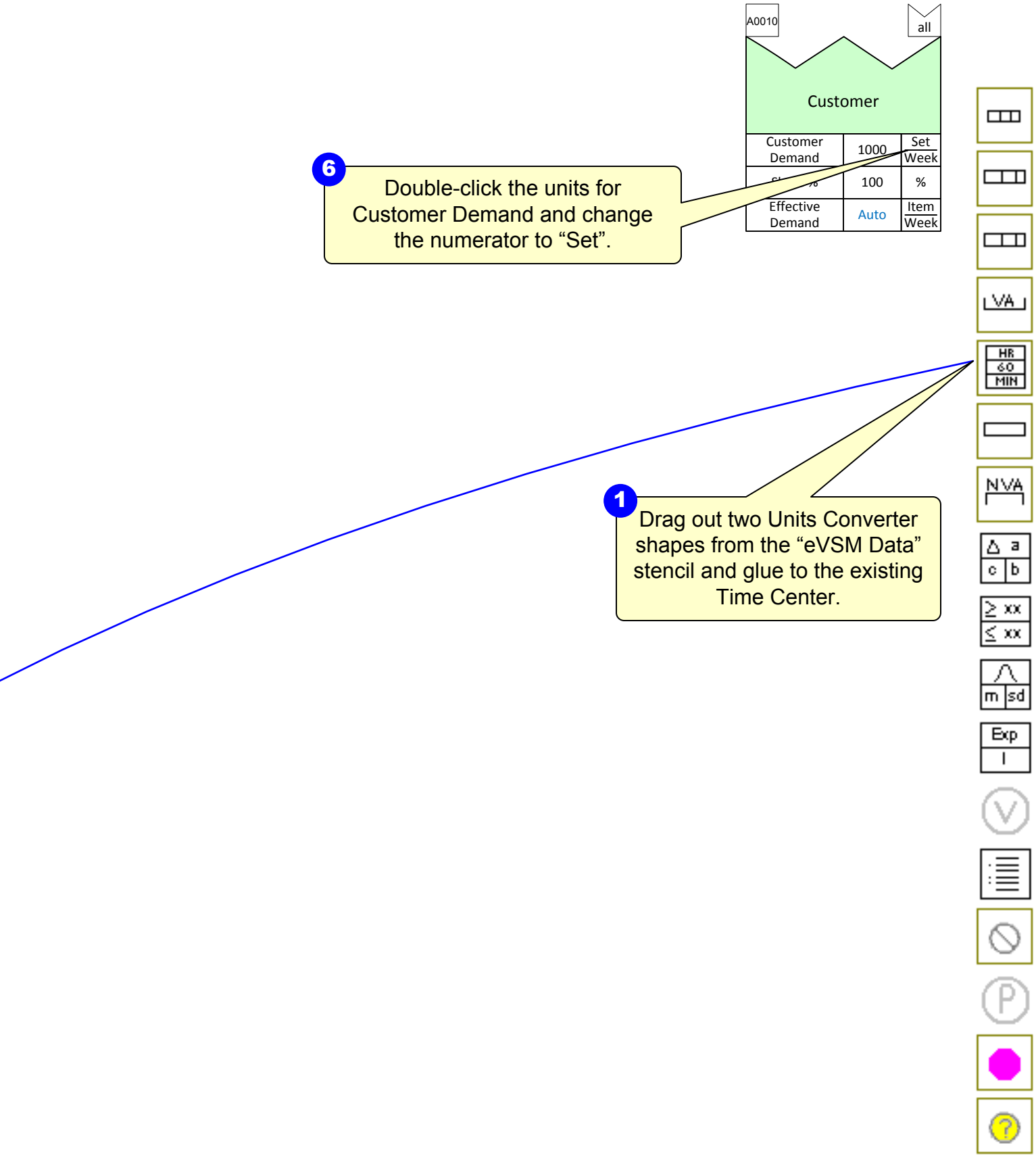

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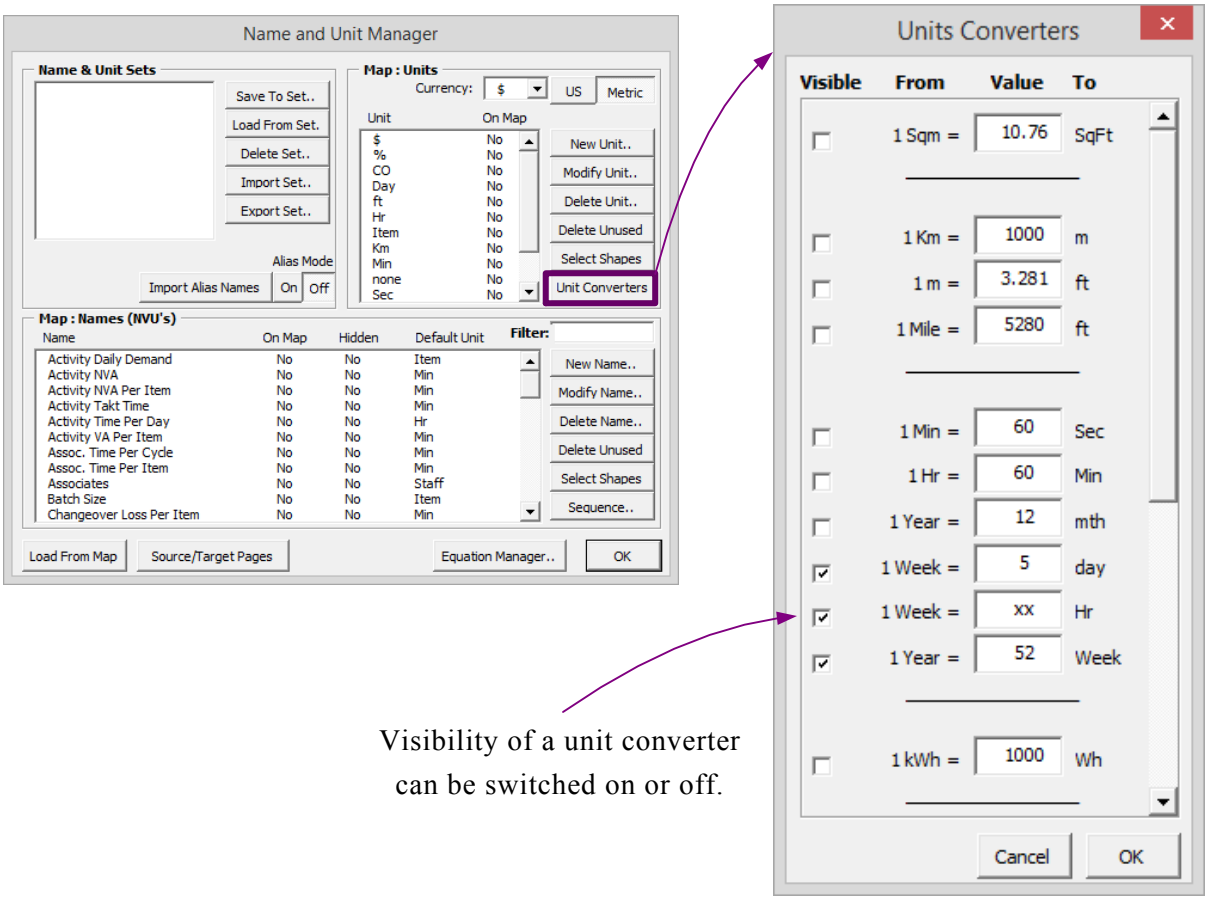
Unit Converters Usage

- Secs/Mins, Mins/Hrs units converters are hidden
- Made visible through NUM button in the toolbar NUM



Visibility of a unit converter can be switched on or off.

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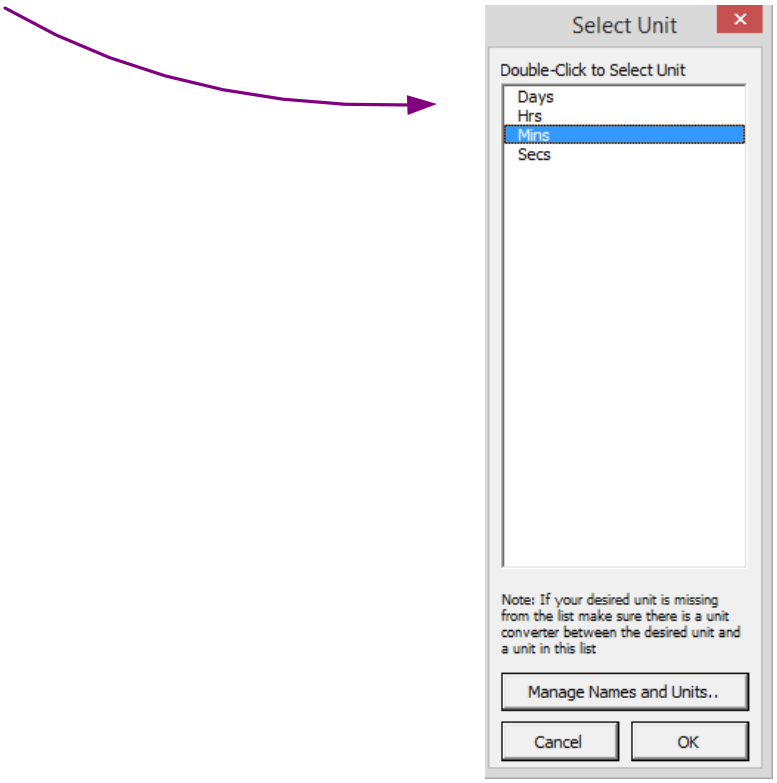
- Unit families eliminate errors when changing units
- Only Time units will appear when double-clicking on Mins to change to Hrs



- If desired unit does not appear:
    - Create a new unit -- OR --
    - Place a units converter on map
- Use NUM button in toolbar to create the new unit
- New unit will require units converter to connect default unit to new unit
- New unit will appear in "Select Unit" window when double-click unit (family) NUM
- If desired unit was in the NUM, add a units converter to the map
- Built-in error proofing to prevent incompatible units

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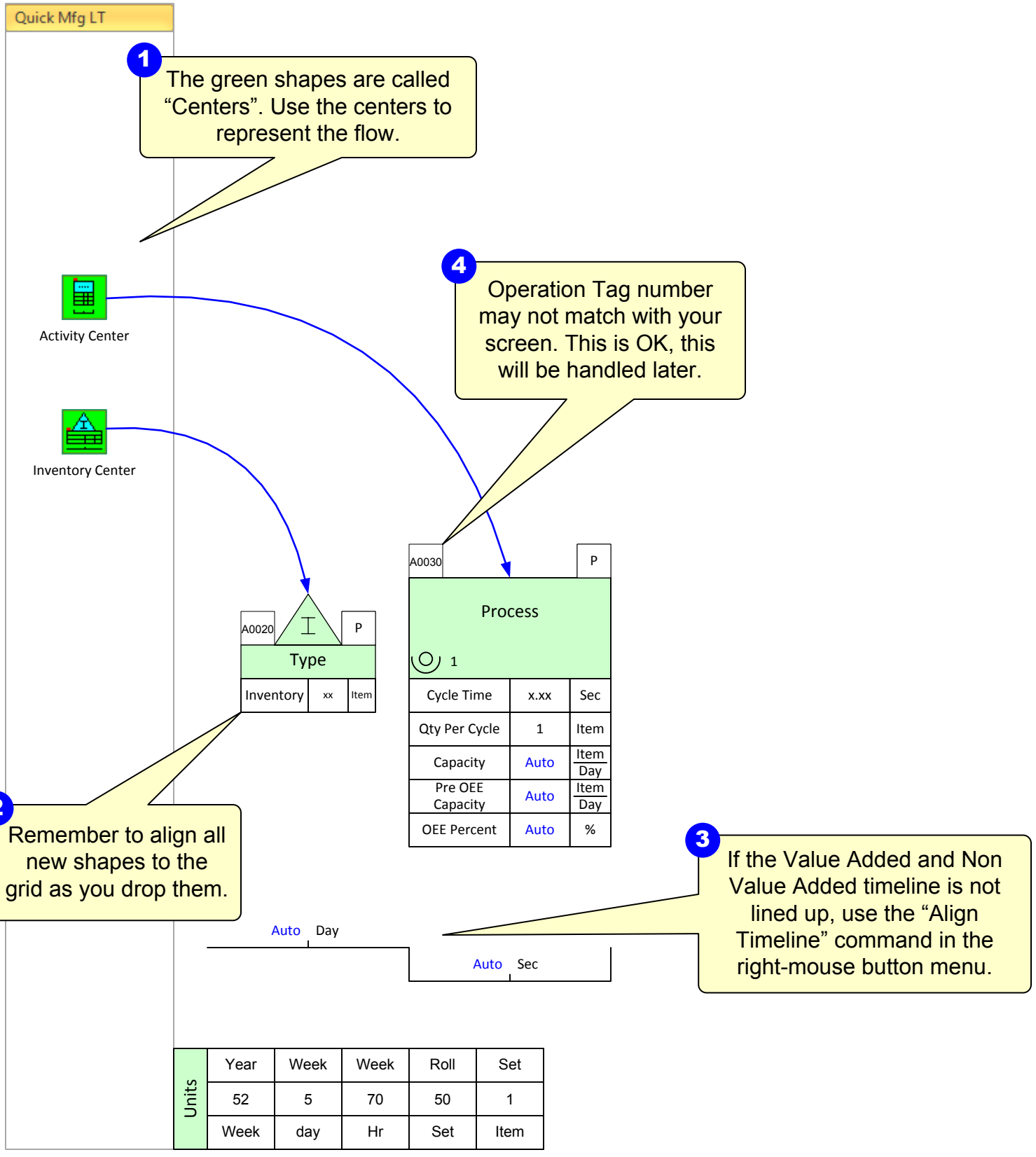
Step 6: Draw the flow



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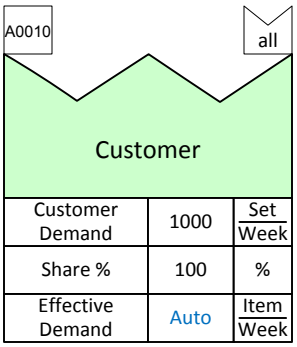

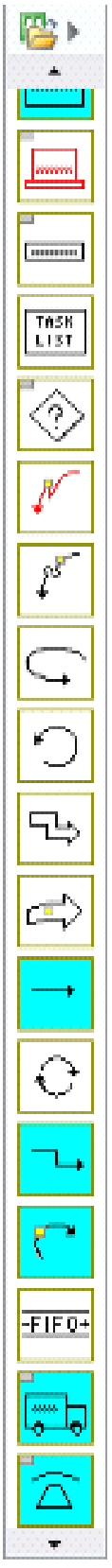

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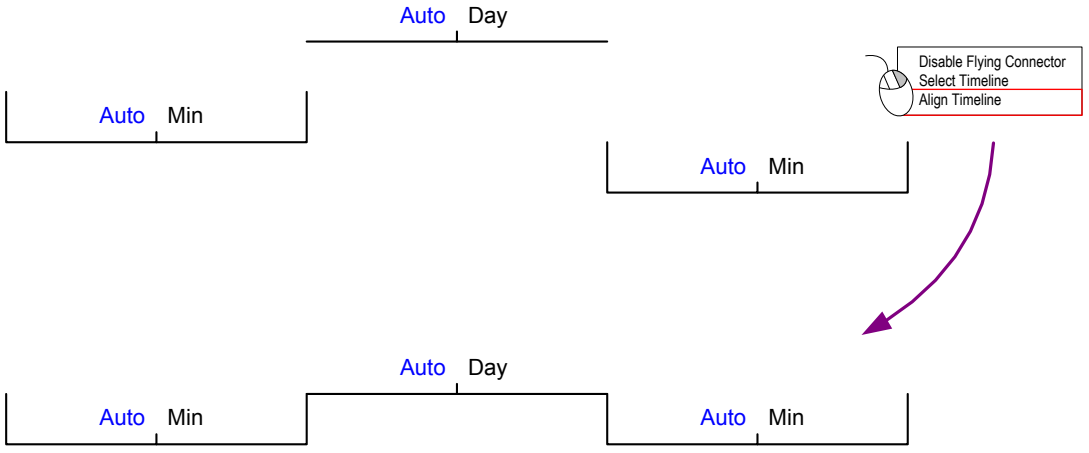
Working with the timeline

- Shift the entire timeline up or down, use “Select Timeline” in the right-mouse menu
- If that option doesn’t appear in the menu, make sure you have the entire VA or NVA shape selected and try again
- “Align Timeline” function also in the right-mouse menu will create the ladder timeline for you if the VA and NVA shapes are not correctly aligned, as shown below



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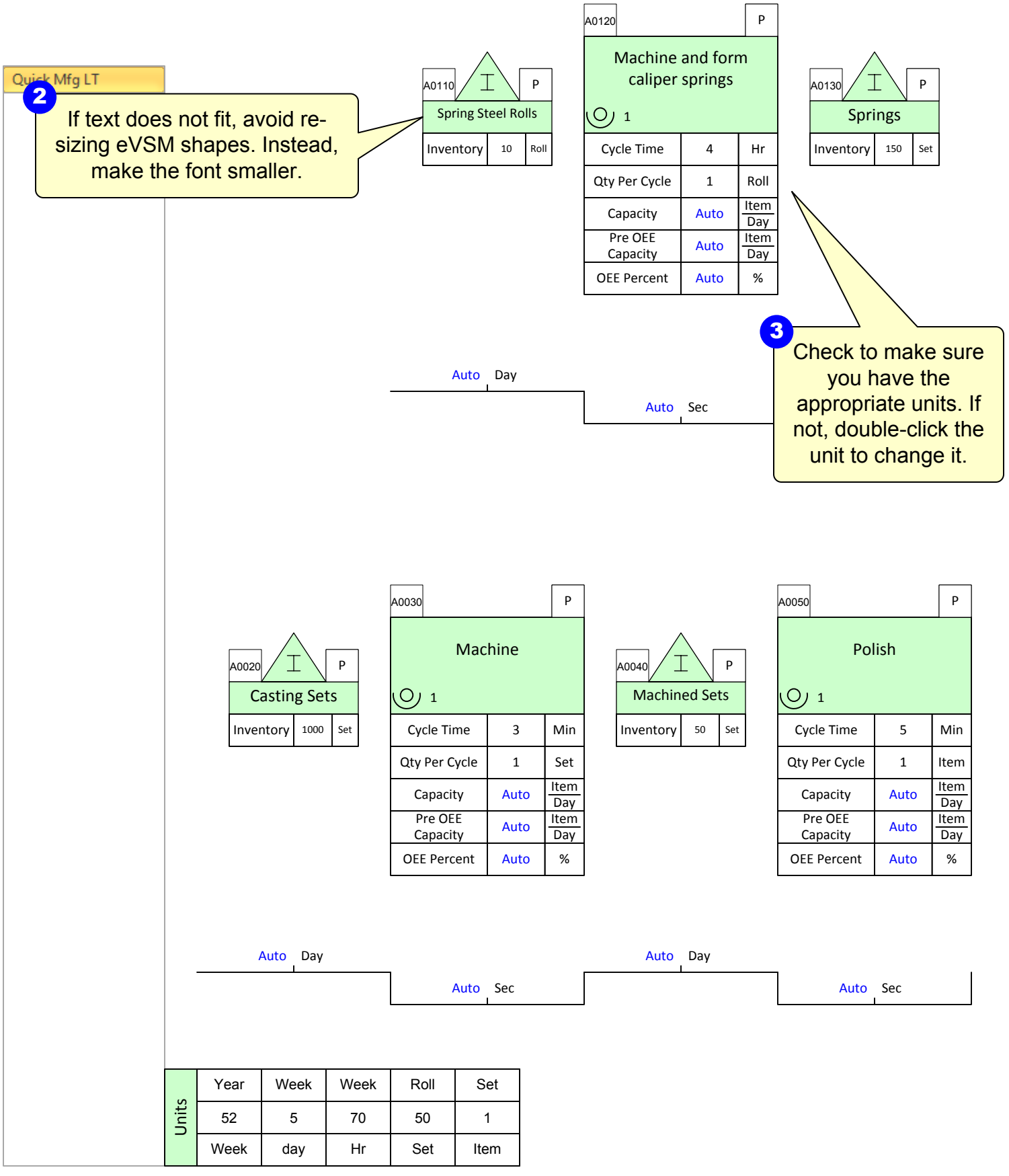
Step 7: Complete the flow and enter data



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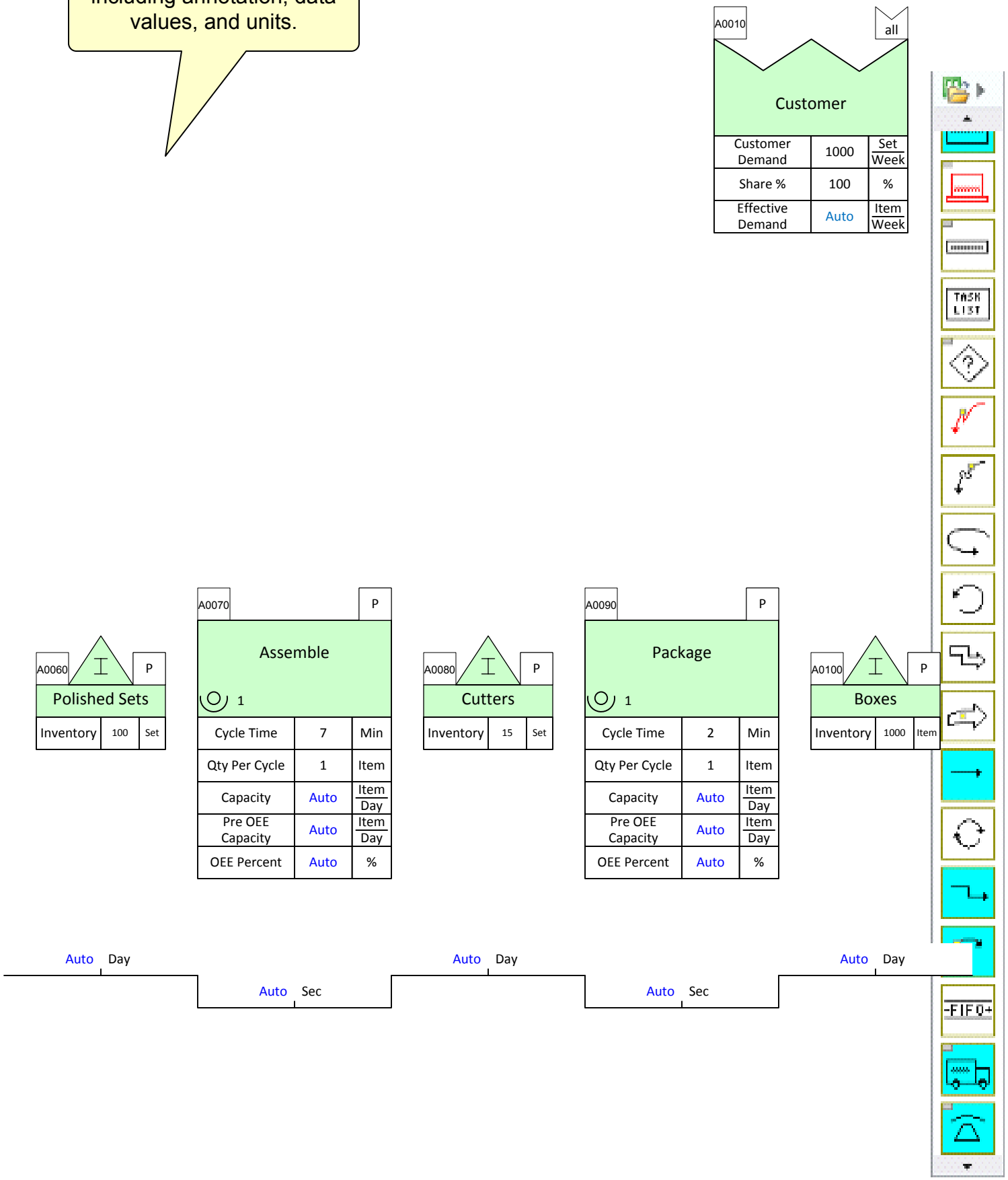
1 Complete as shown below, including annotation, data values, and units.



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Fractional Units

- Fractional units makes specifying and computing demand quantities or production times easier
- Provides better control of data entry and display
- Fractional units changed like any other unit on map using the NUM button in the toolbar

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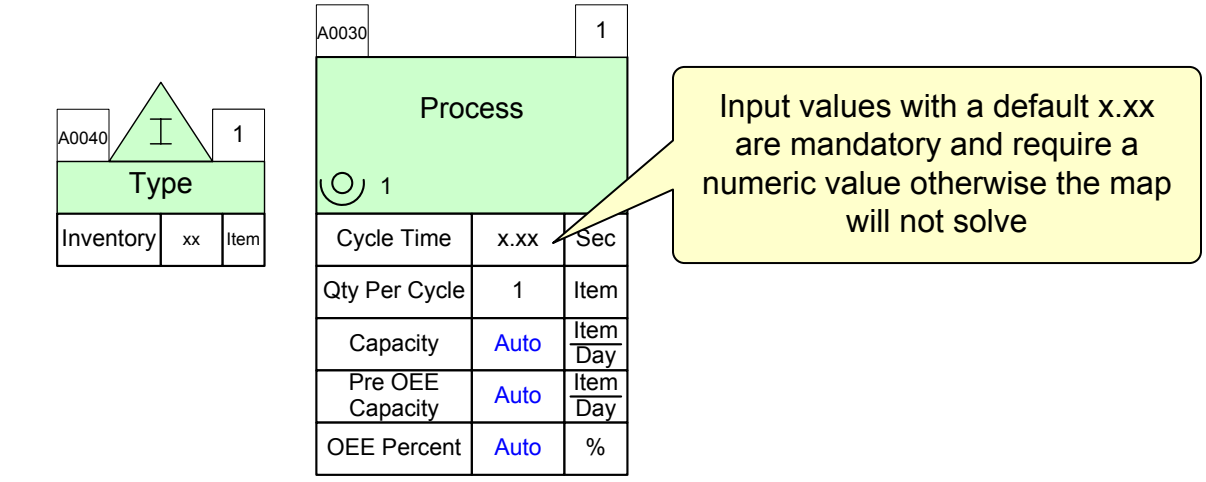
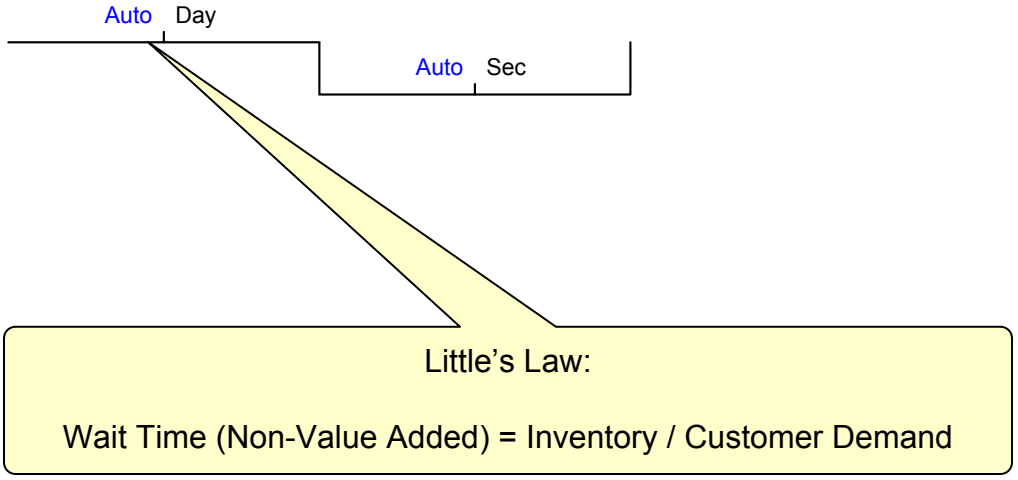
Data Entry Hints





- When entering data use tab key to go to next NVU
- Non-Value Added and Value Added ladders are already glued to Activity Center and Inventory Center, respectively
- The standard NVUs on an Activity Center are required for calculations and MUST NOT be deleted

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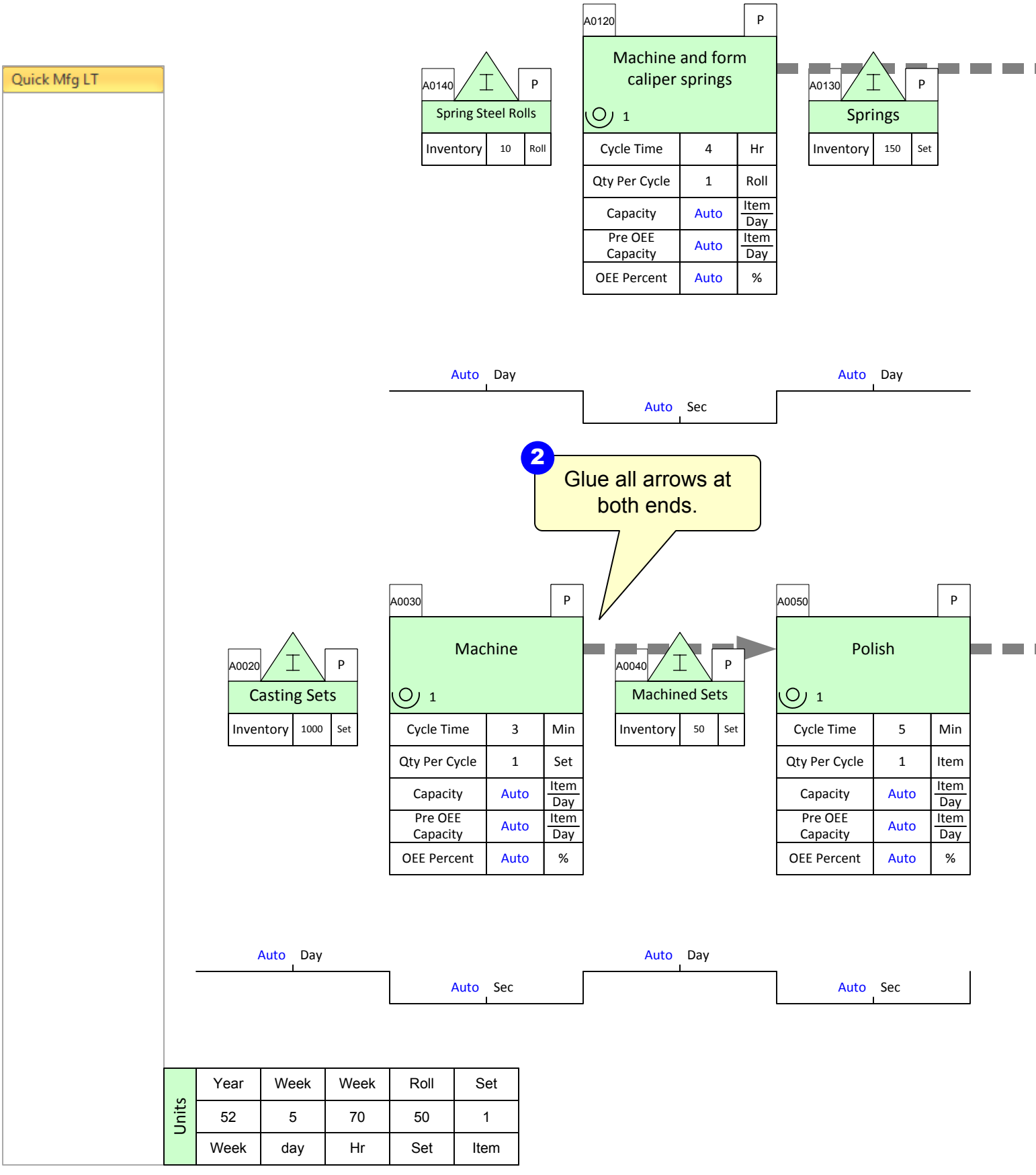
Step 8: Add Arrows from Main Stencil



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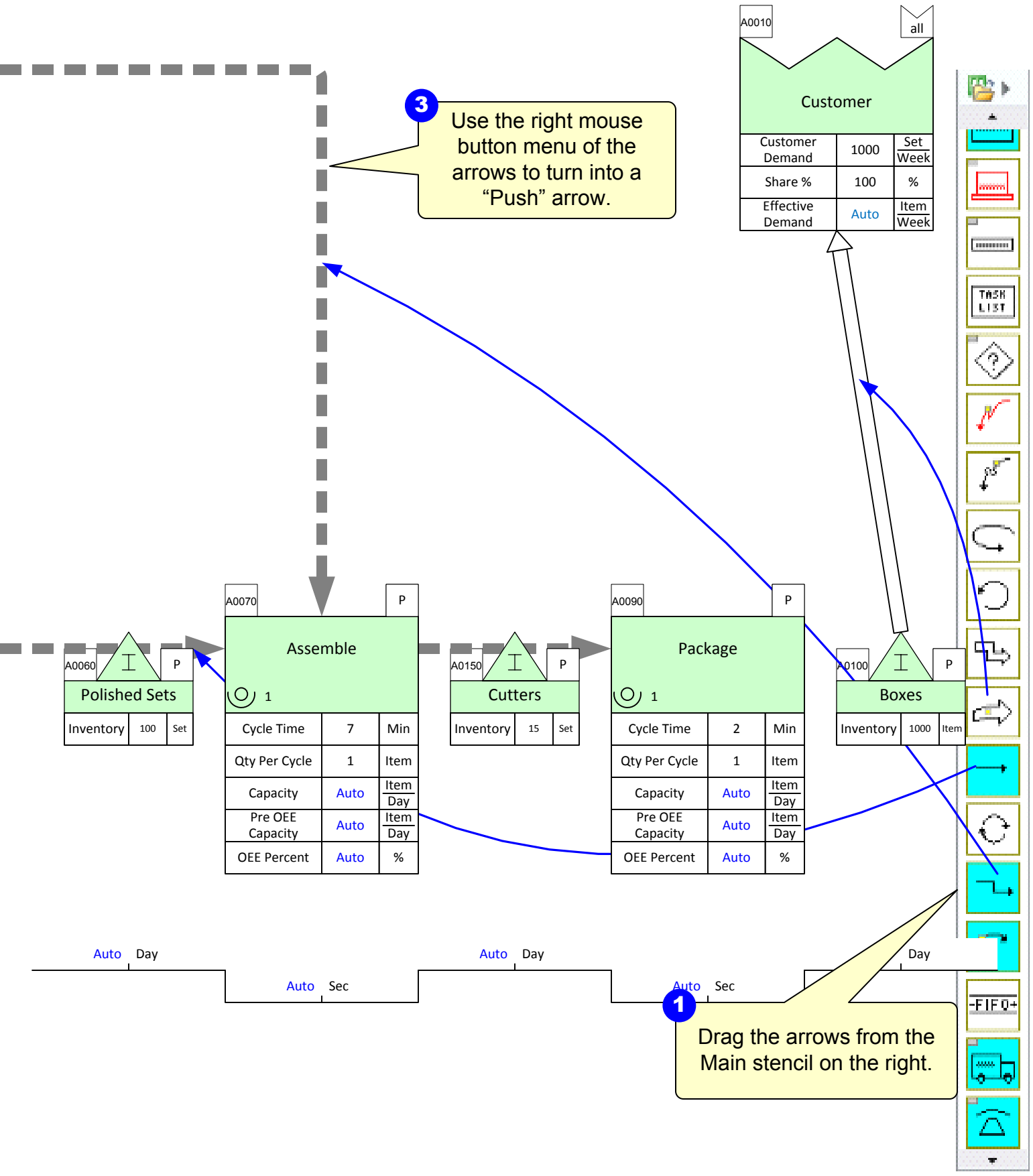

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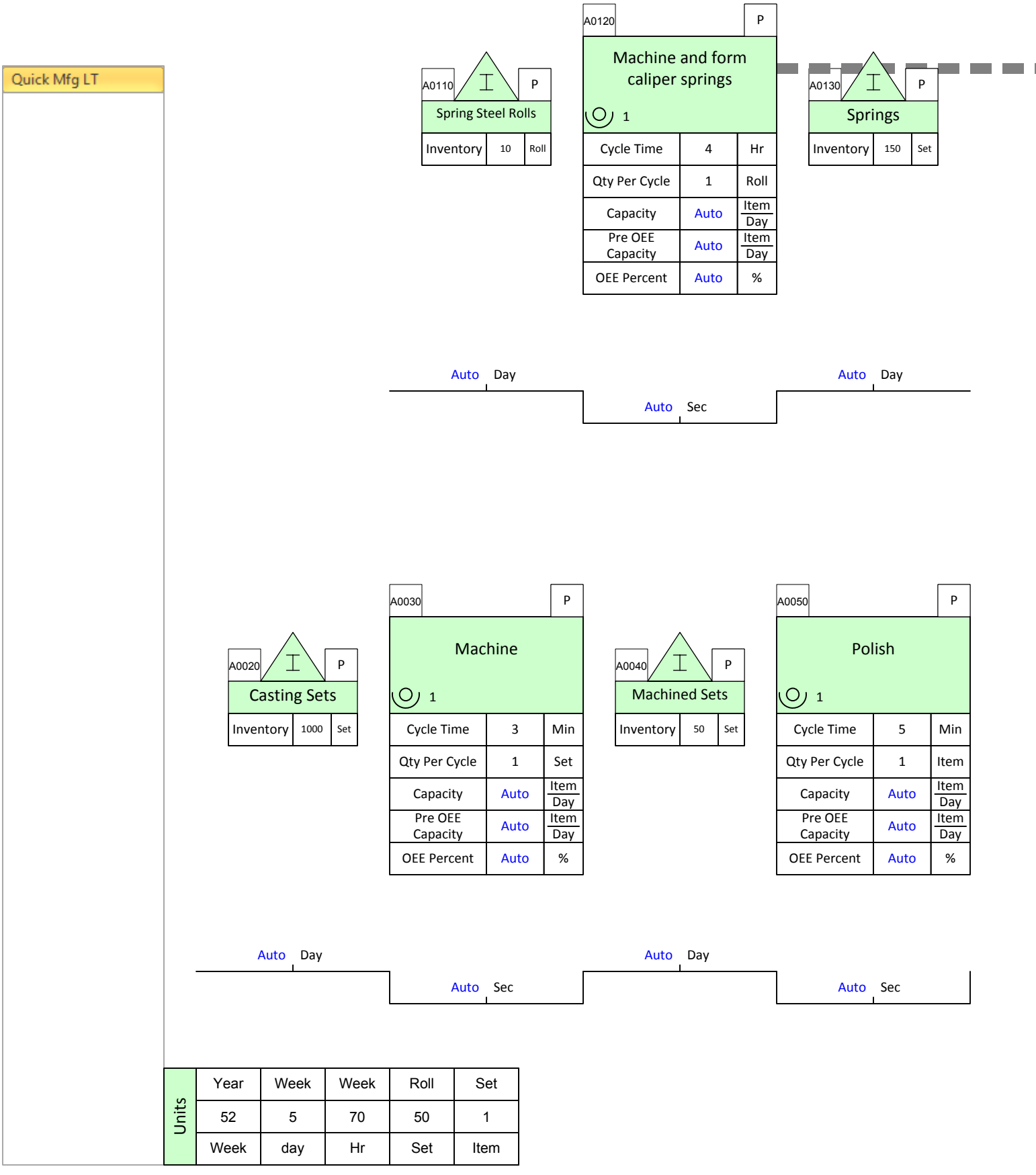
Step 9: Add Transport shapes



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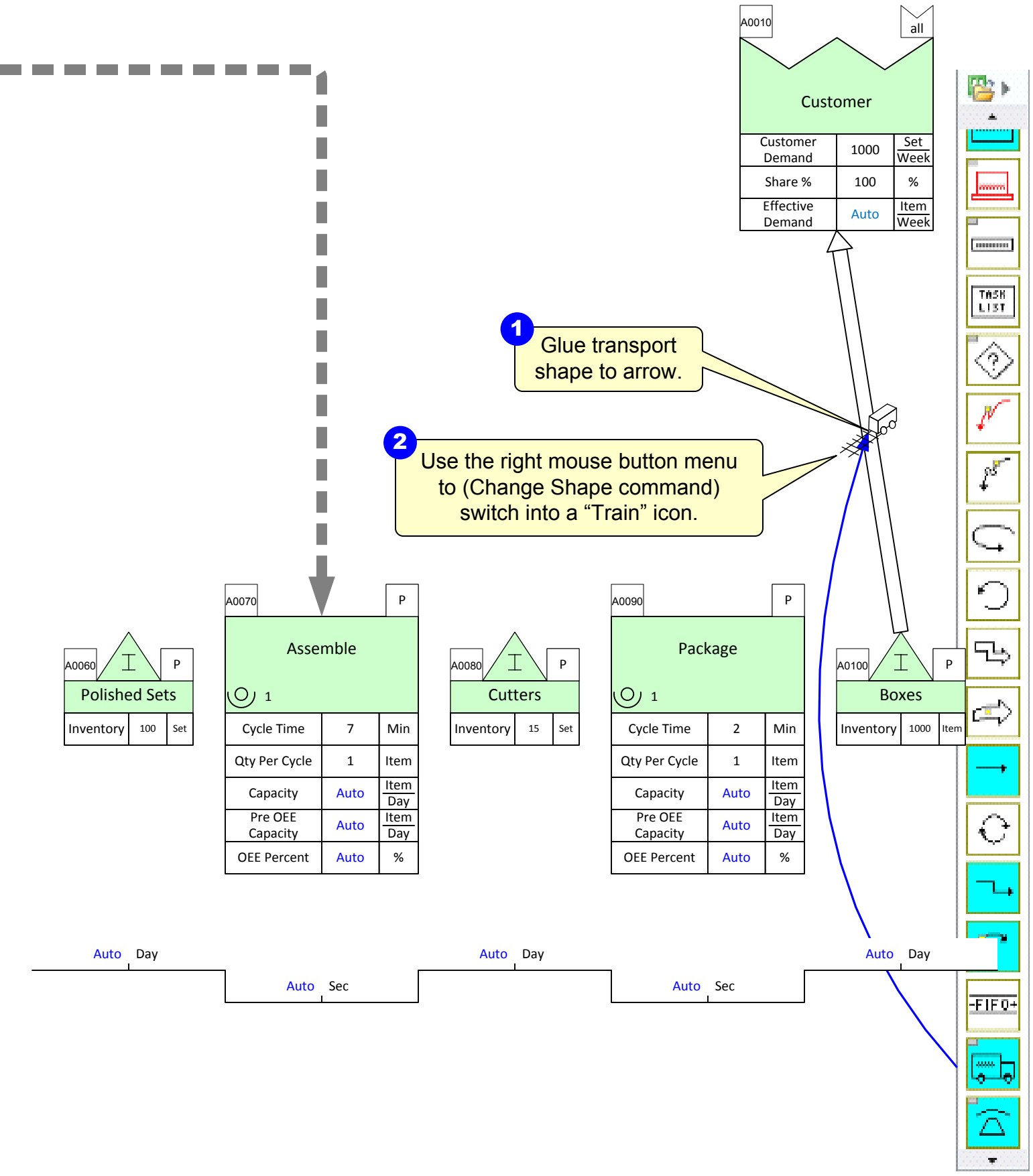

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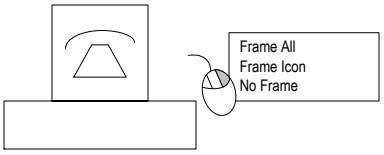
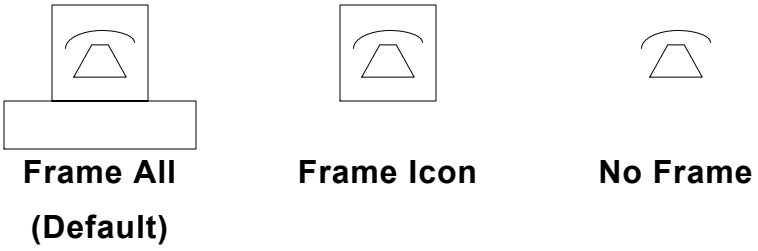
Transport, Transmit, and Flow Shapes

- Transport, Transmit, and Flow Shapes now have text box framed to allow data values to be added if needed
    - If data is added to shape, an Operation Tag and Path Locator needs to be added
- To remove frame, right-click on shape and select “Frame Icon”





- Use Text Block tool to move text

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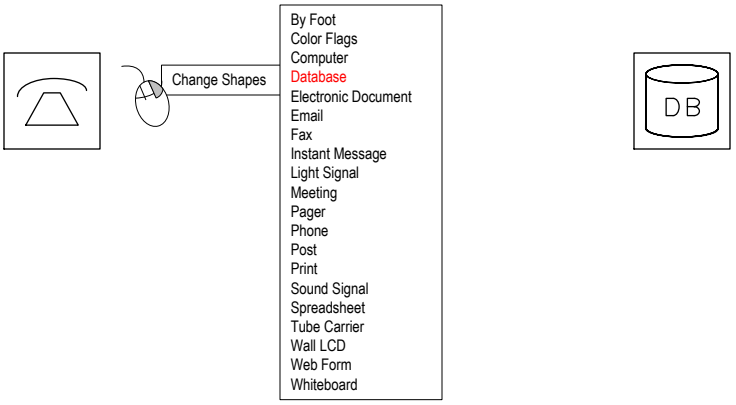
Blue Stack Shapes

- Blue icon stack has other shapes to choose
- Right-click on shape and select desired shapes
- Use the Stack Help button in the toolbar to see complete list of shapes in a stack after selecting a blue or green stack icon from a stencil



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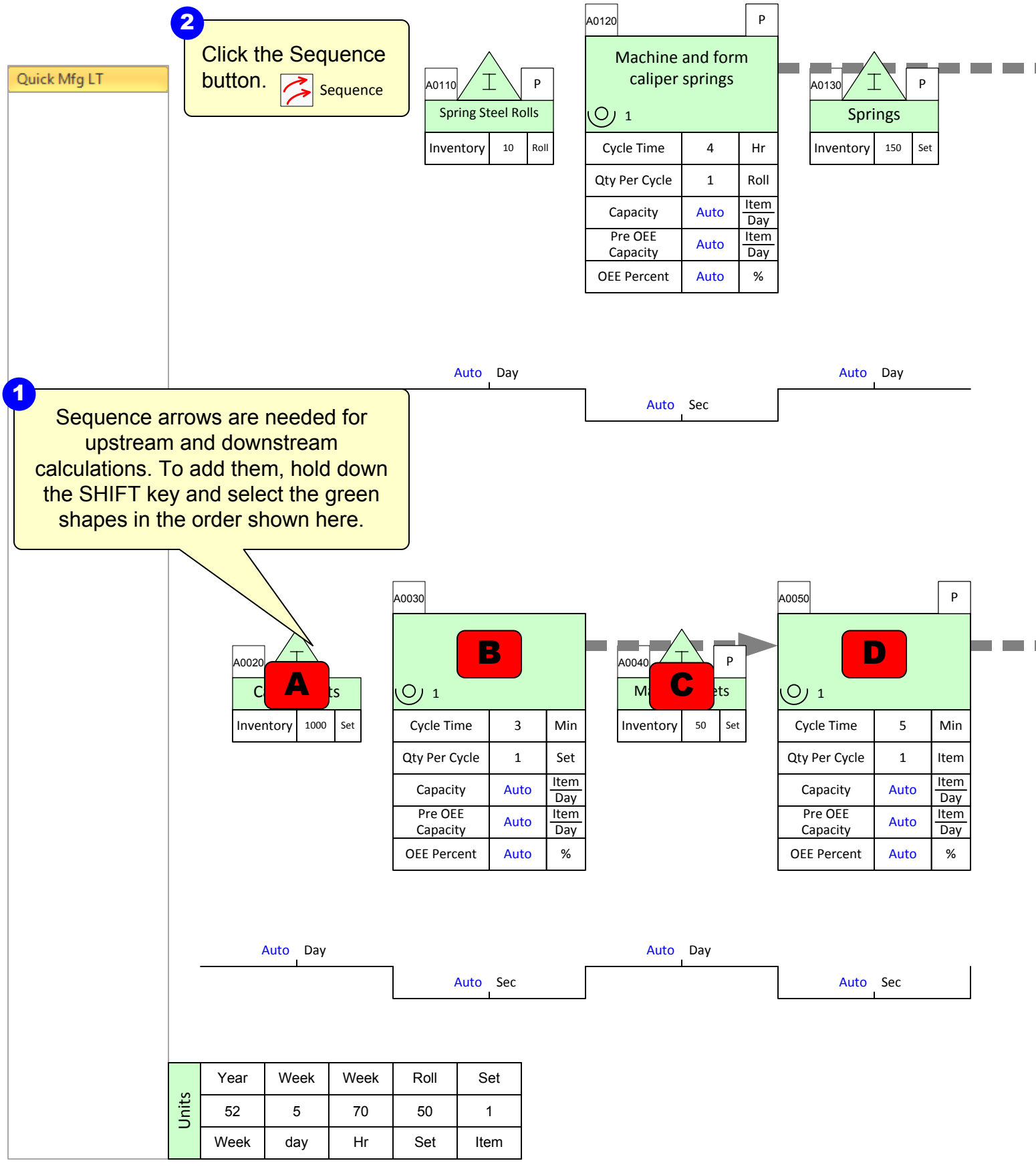
Step 10: Sequence Arrows



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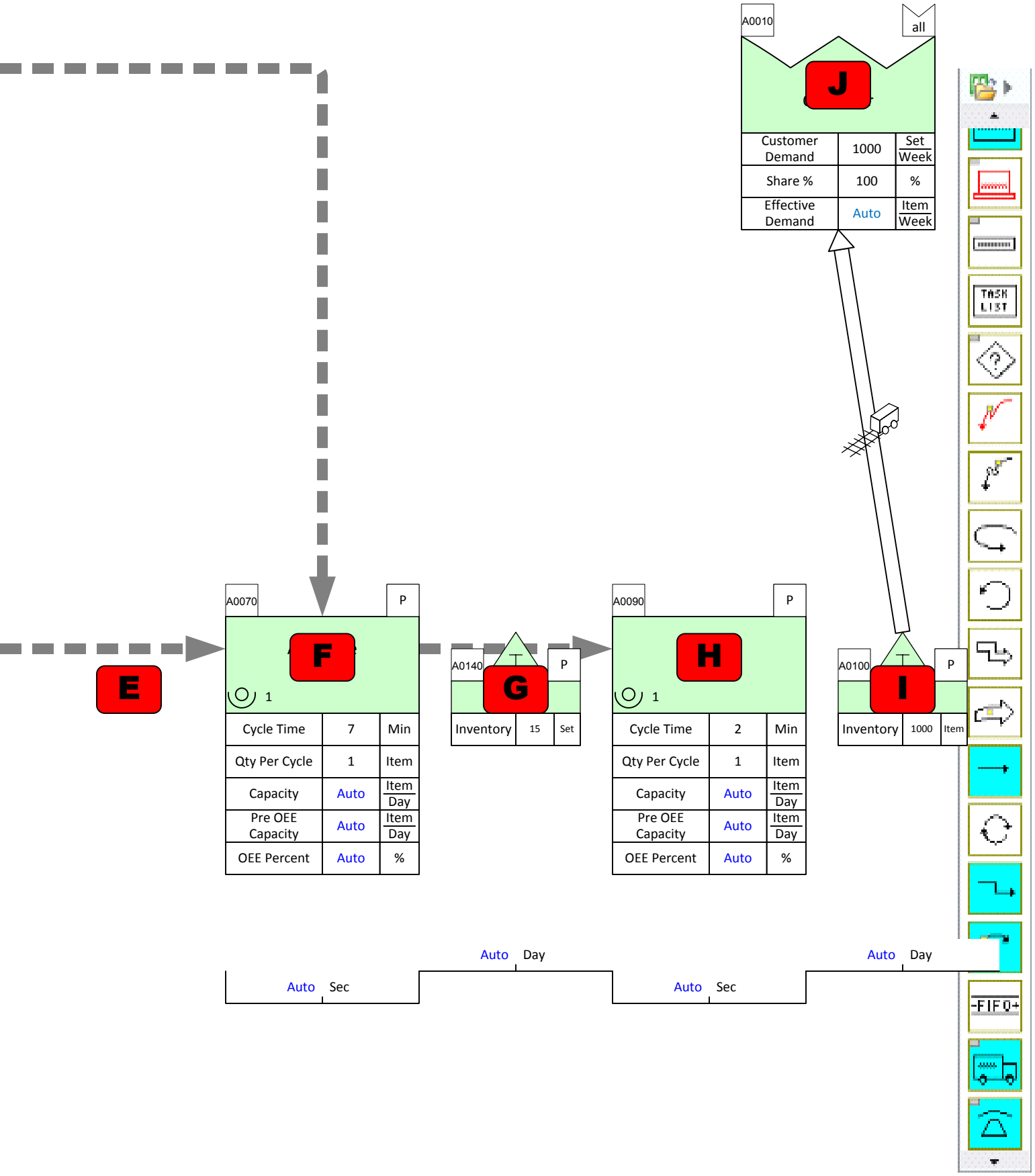

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Sequence Arrows

Sequence

- Provide a means of generating tag numbers in upstream to downstream sequence (using the AutoTag button) Auto Tag
- Provide a means of generating path numbers that comprehend all of the paths on the map (using the Auto Path button) Auto Path
- Are the basis for upstream/downstream calculations in the built-in eVSM equations
- Sequence arrows can be added for a few centers at a time or in a continuous path.

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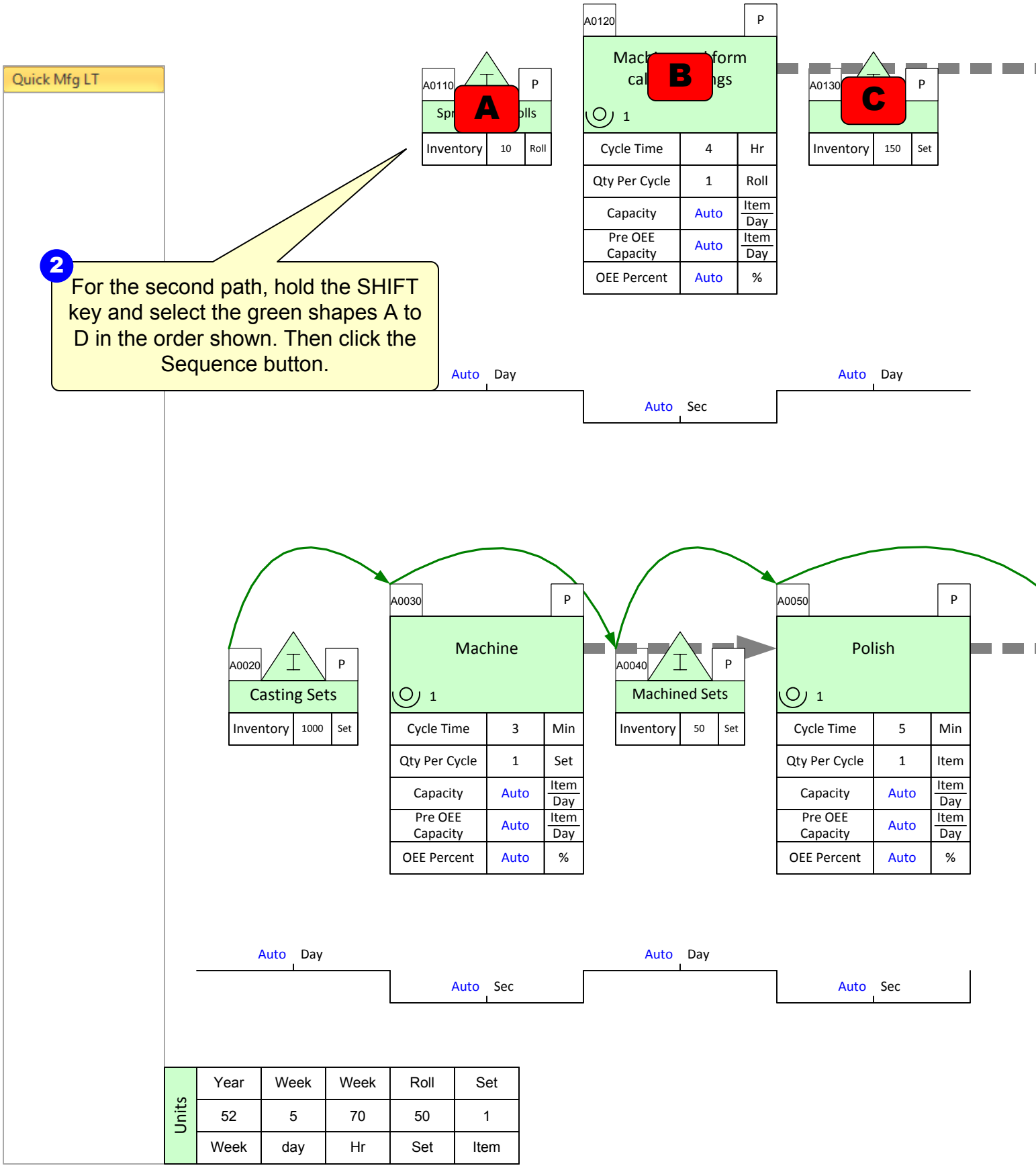
Step 11: Sequence Path 2



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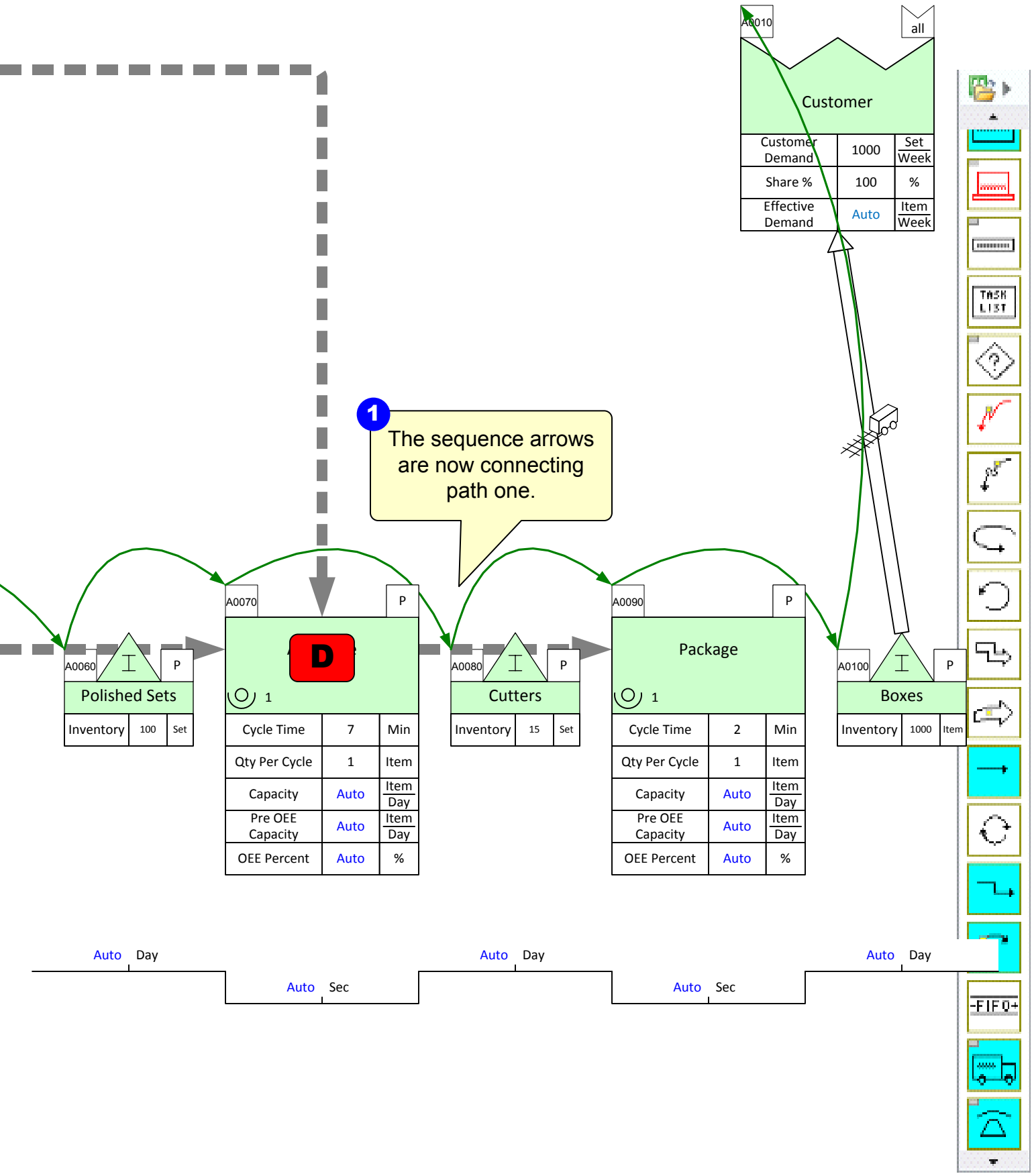

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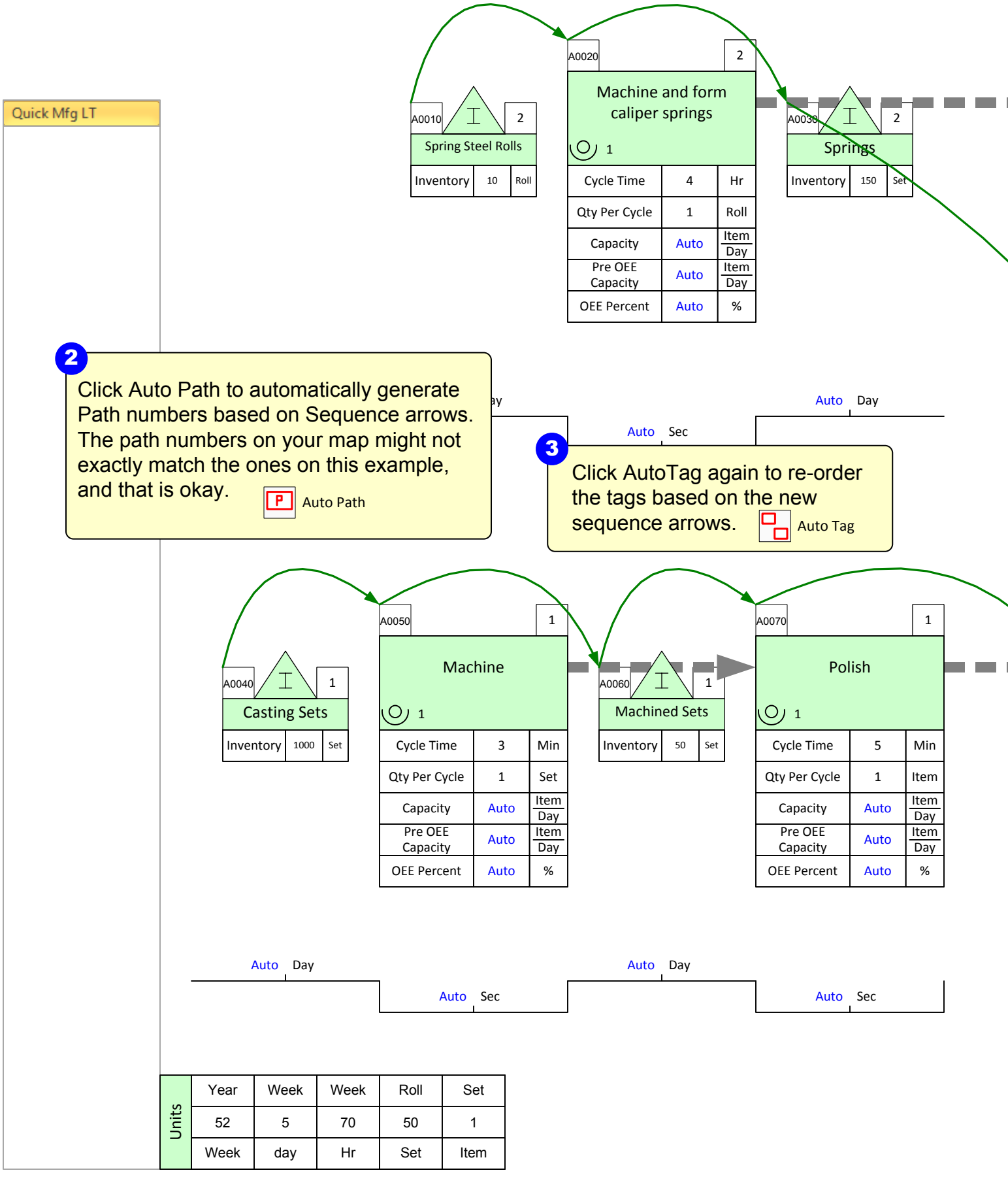
Step 12: Use Auto Path to Generate Path ID's based on Sequence Arrows



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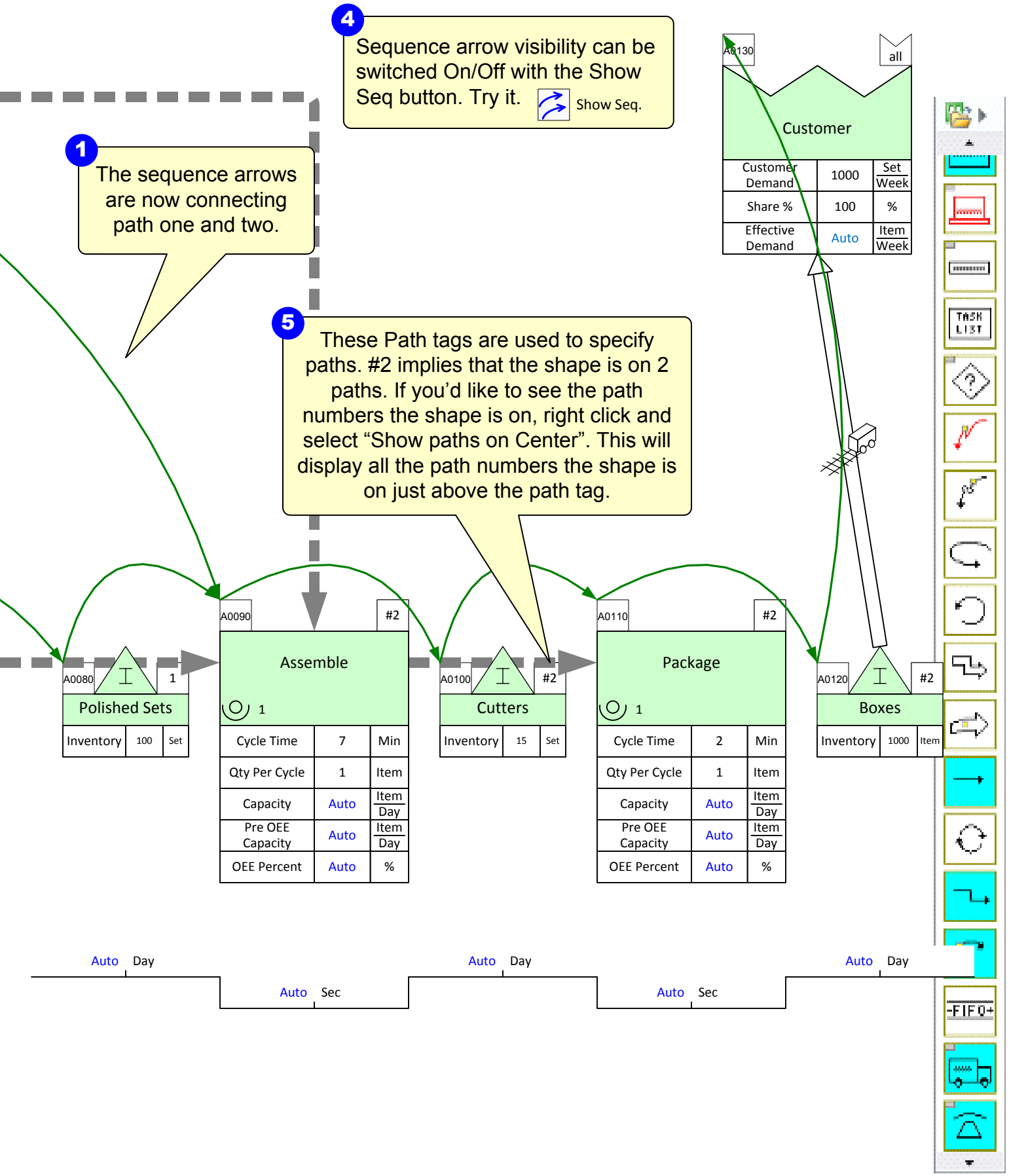

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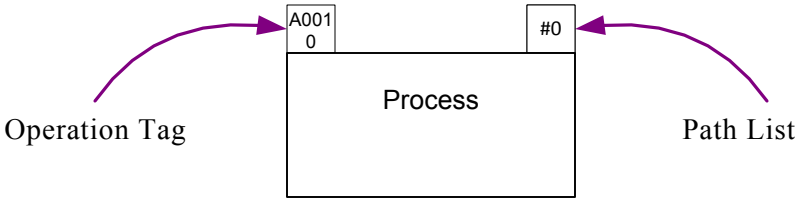
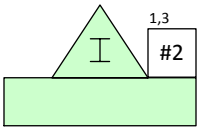
Path List



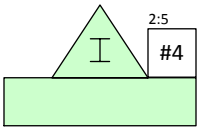
- Path List: The Path List is used to identify a path that an activity (or other shape able to be tagged) belongs to. The shape is glued above the top right corner of the shape.
- An activity can belong to no paths, one or more, or all paths. The benefit of assigning path numbers to activities is that the associated activity variables (like NVA time) can be summed up across the map in a path specific sense.
- After you have used the Auto Path function, the Path List will appear as either of the following:

6	The center is only on path 6
#4	The center is on 4 different paths

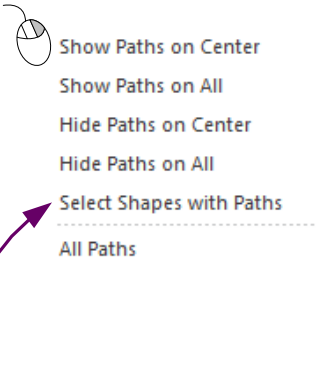
Right clicking on the Path List shape will pull up a menu to display all the path numbers on each center/page, or to hide all paths on each center or for the whole page.



The "1,3" indicates that this center is on paths 1 and 3



The "2:5" indicates that this center is on paths 2 through 5 (2, 3, 4, 5)



Using the "Select Shapes with Paths" option will highlight all shapes on the map that have those specific path numbers.

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Operation Tags

- Operation Tags:
  - Provides short name for process step
  - Identifies process step to Excel for calculations
  - Defines the order in which data is plotted on charts
  - Operation Tags MUST be 1-alpha and 4-numeric characters (ie: A0200)
  - Are typically assigned using the Auto Tag button and AFTER sequence arrows have been applied

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Step 13: Time Summary by Path

1 Drag out two Time Summary Centers.

2 Double-click to change this path filter to "1" using the Path Filter Manager.

3 Select the path number and click the Add button

4 Double-click to change both units to Min on each Time Summary.

Quick Mfg LT

Time Summary

Z0010 P

Time Summary		
Lead Time	Auto	Day
Total Value Added	Auto	Min
Value Added Percent	Auto	%
Takt Time	Auto	Min / Item
Total Cycle Time	Auto	Min

Z0020 P

Time Summary		
Lead Time	Auto	Day
Total Value Added	Auto	Min
Value Added Percent	Auto	%
Takt Time	Auto	Min / Item
Total Cycle Time	Auto	Min

A0060 2

A0080 2

machine and form caliper springs

Path Filter Manager

All Paths

Path # Path Alias

Search ?

all

1

2

Explore

Add

Selected Paths

1

Remove

Explore

Highlight Cancel OK

A0010 1

Casting Sets

Inventory	1000	Set

A0020 1

Machine

1

Cycle Time	3	Min
Qty Per Cycle	1	Set
Capacity	Auto	Item / Day
Pre OEE Capacity	Auto	Item / Day
OEE Percent	Auto	%

A0030 1

Machined Sets

Inventory	50	Set

A0040 1

Polish

1

Cycle Time	5	Min
Qty Per Cycle	1	Item
Capacity	Auto	Item / Day
Pre OEE Capacity	Auto	Item / Day
OEE Percent	Auto	%

Auto Day Auto Sec Auto Day Auto Sec

Units	Year	Week	Week	Roll	Set
	52	5	70	50	1
	Week	day	Hr	Set	Item

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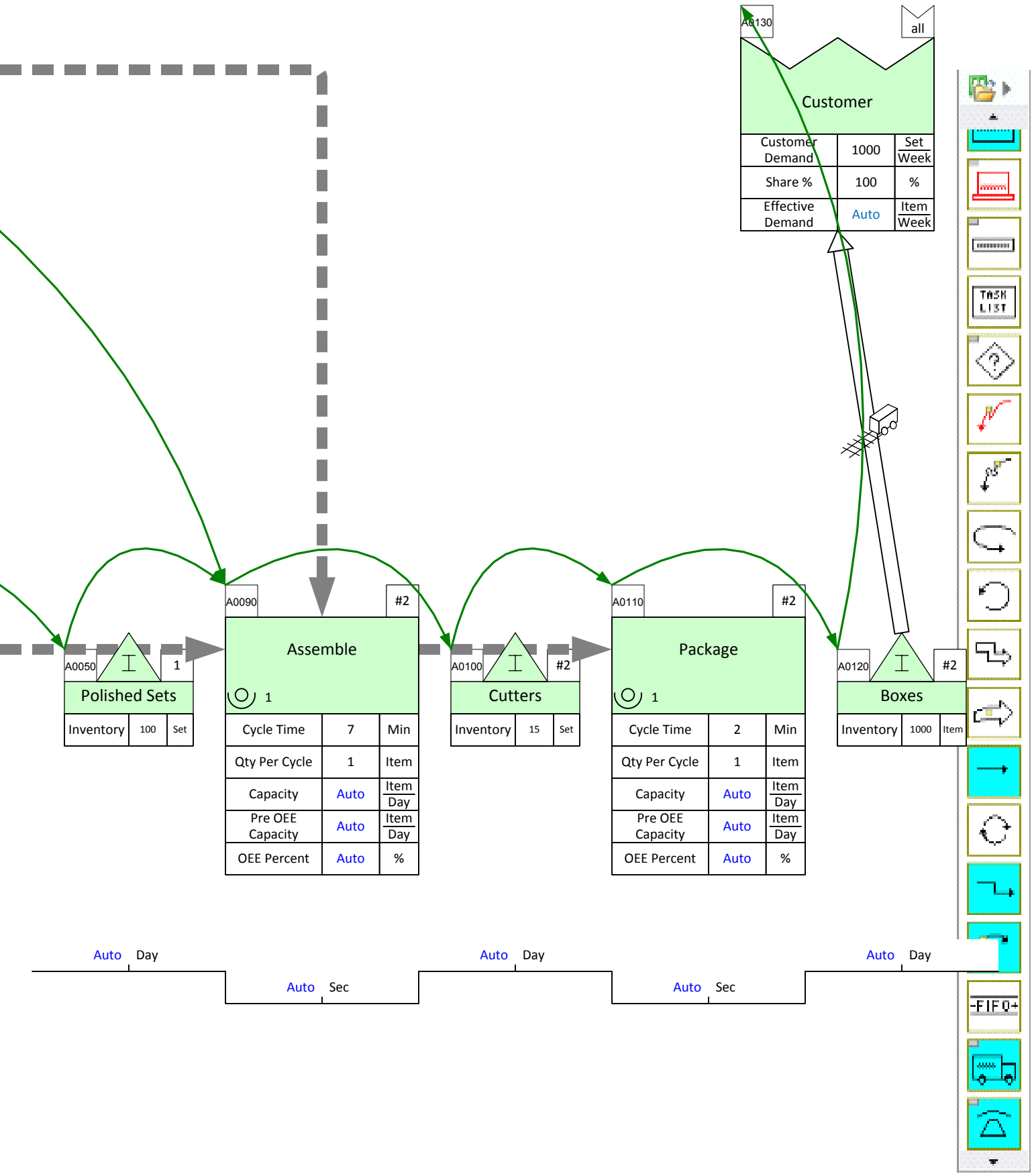

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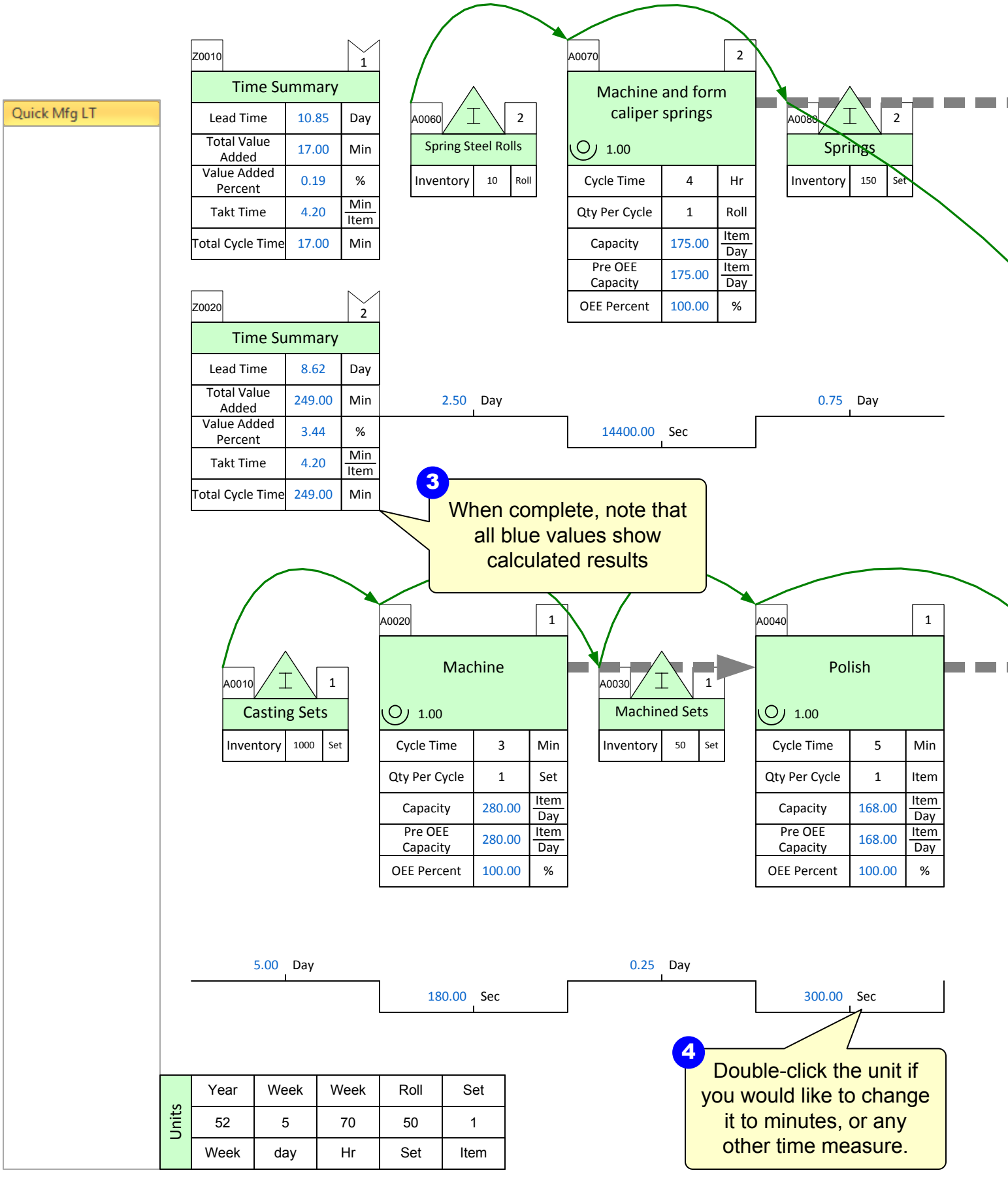
Step 14: Perform Calculations



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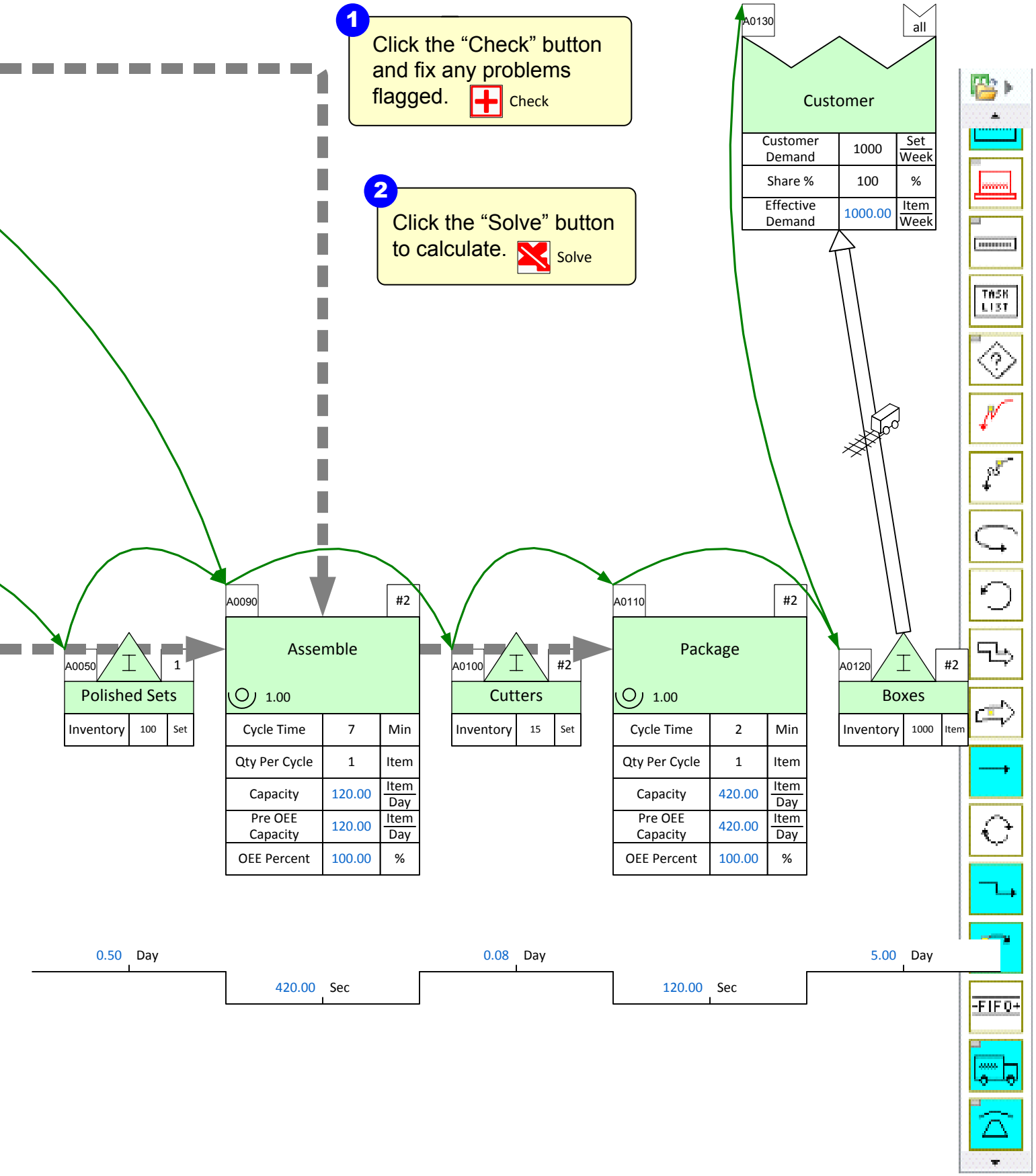

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First Check then Solve

Users should first Check and then Solve the map.

Check Button

- Performs comprehensive model checking
- Fixes obvious problem
- Provides list of outstanding issues

Solve Button

- Performs basic model checking
- Stops if there is any obvious issues like missing data values
- Solves the built-in equations and puts the results on the map
- Exports data to an Excel spreadsheet

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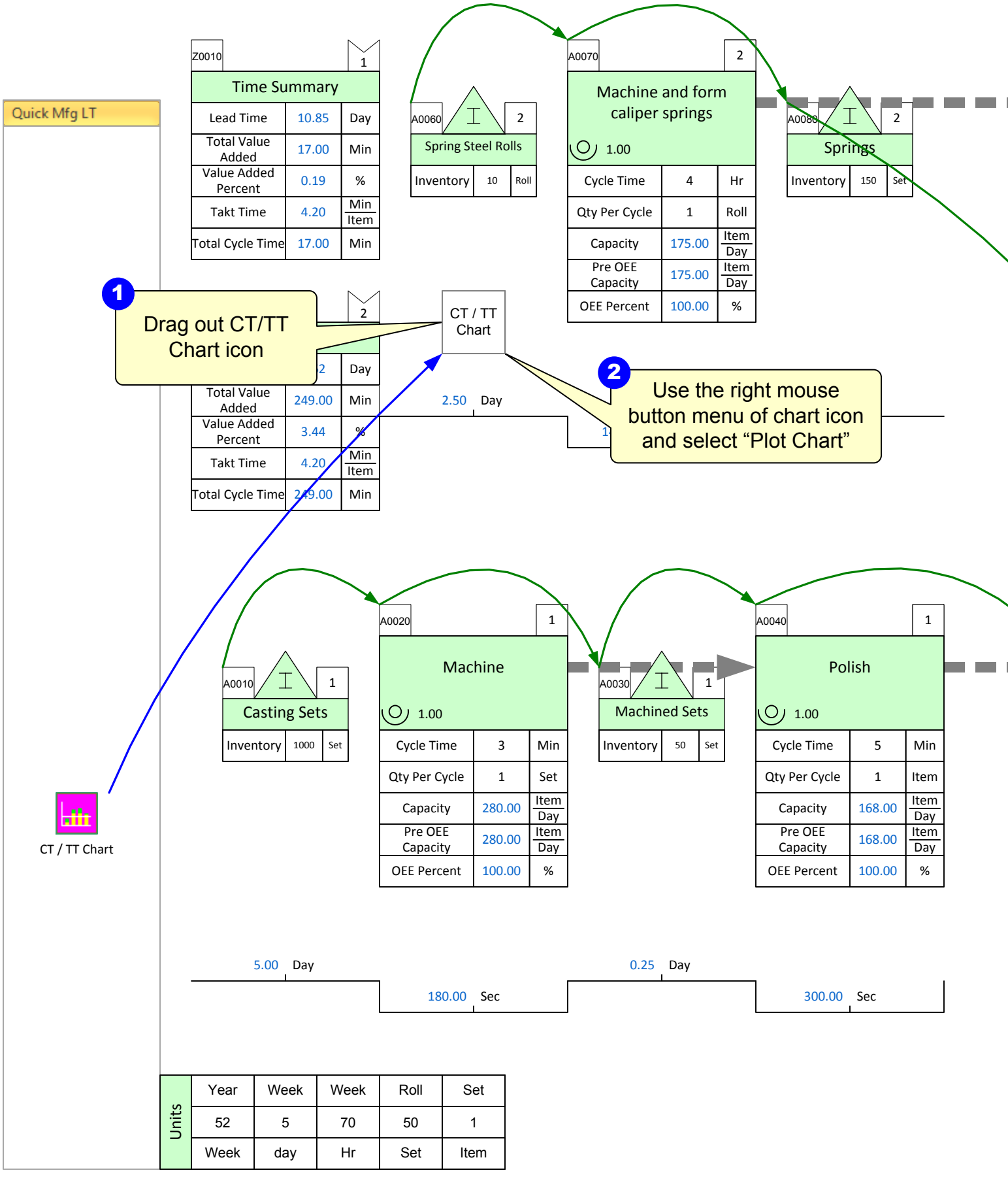
Step 15: Add Cycle Time Takt Time Chart



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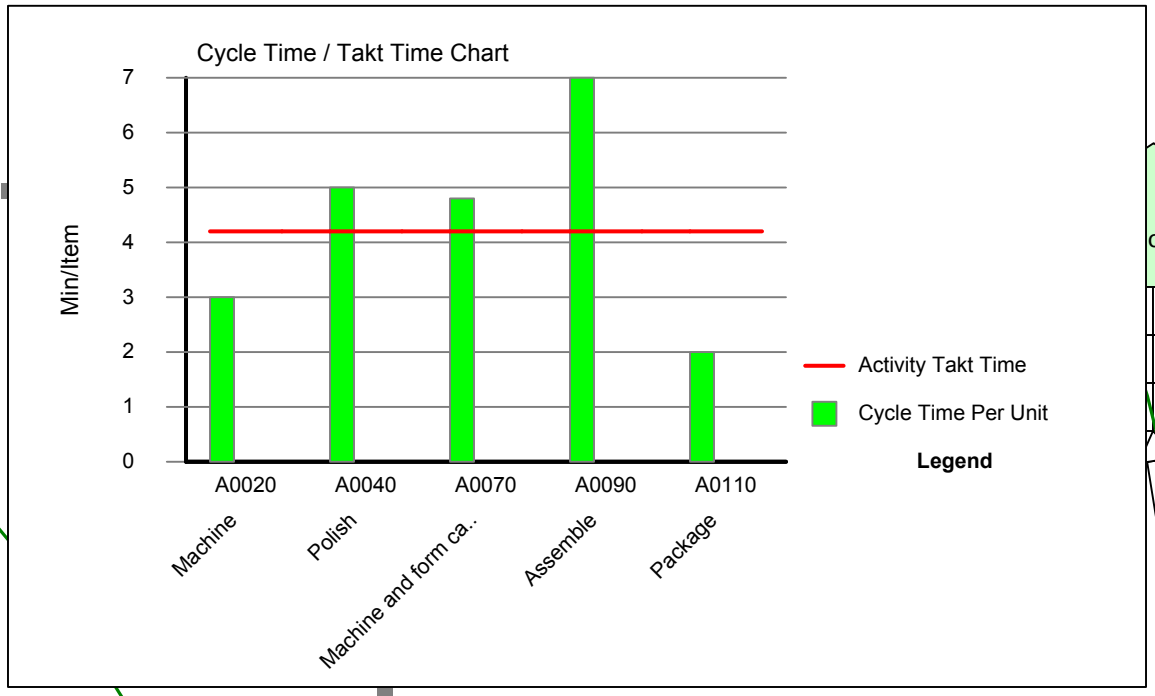

all

omer

1000	Set / Week
100	%
1000.00	Item / Week

A0050 | 1 | Polished Sets

Inventory	100	Set

A0090 | #2 | Assemble | 1.00

Cycle Time	7	Min
Qty Per Cycle	1	Item
Capacity	120.00	Item / Day
Pre OEE Capacity	120.00	Item / Day
OEE Percent	100.00	%

A0100 | #2 | Cutters

Inventory	15	Set

A0110 | #2 | Package | 1.00

Cycle Time	2	Min
Qty Per Cycle	1	Item
Capacity	420.00	Item / Day
Pre OEE Capacity	420.00	Item / Day
OEE Percent	100.00	%

A0120 | #2 | Boxes

Inventory	1000	Item

0.50 Day — 420.00 Sec — 0.08 Day — 120.00 Sec — 5.00 Day

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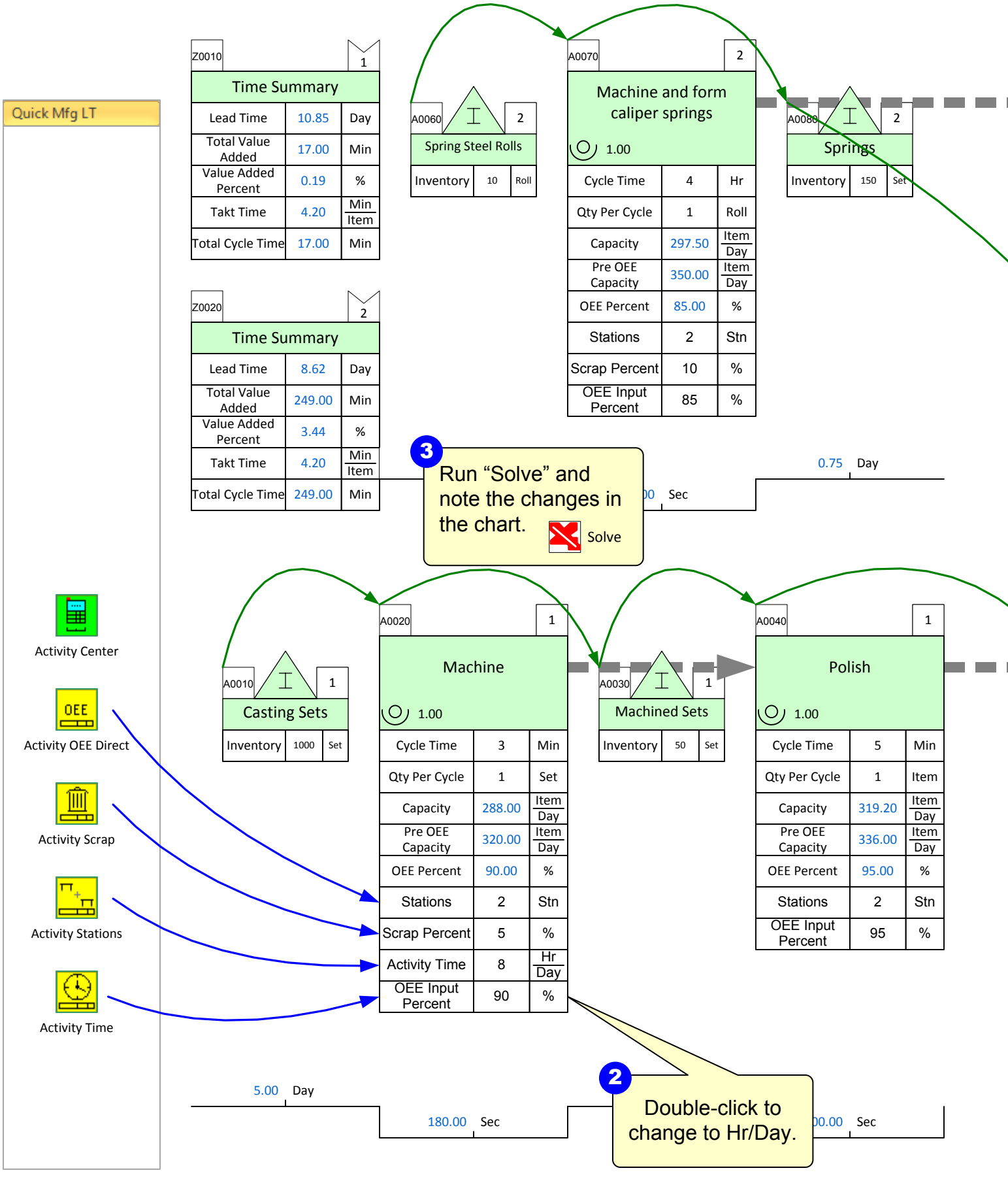
Step 16: Try Add-on Calculations: OEE, Scrap, Activity Time



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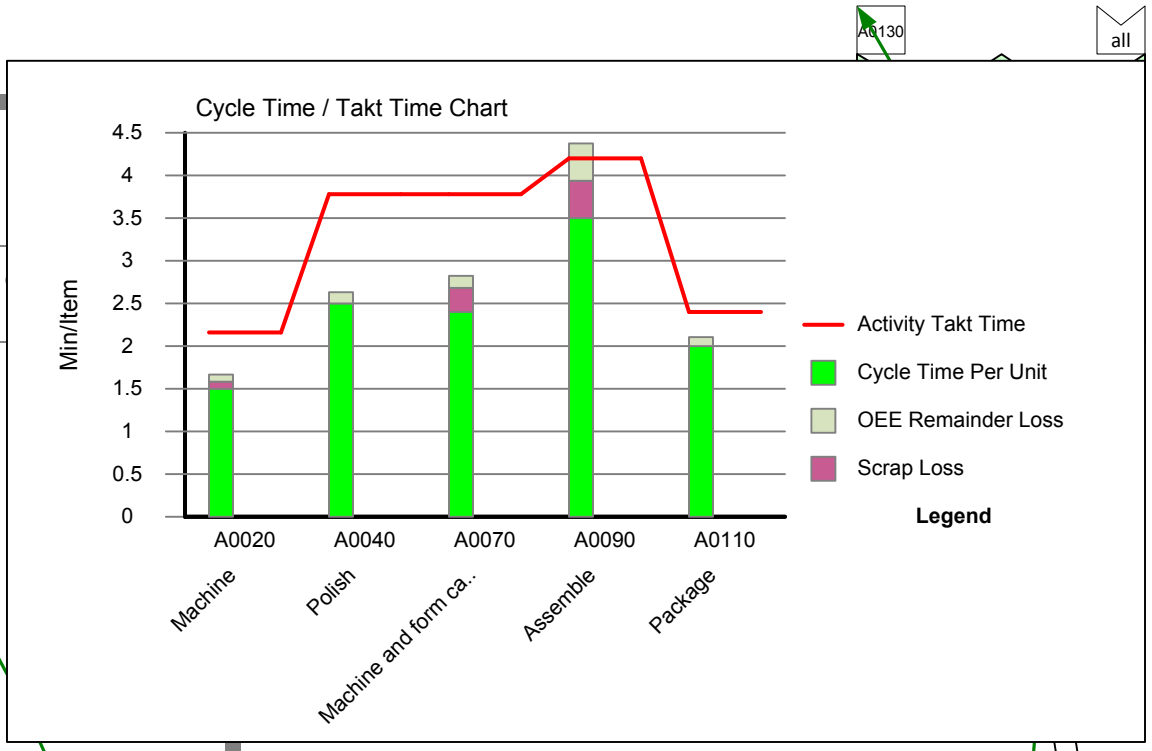
Units	Year	Week	Week	Roll	Set
	52	5	70	50	1
	Week	day	Hr	Set	Item



A0050 | 1 | Polished Sets

Inventory	100	Set

A0090 | #2 | Assemble | 1.00

Cycle Time	7	Min
Qty Per Cycle	1	Item
Capacity	192.00	Item / Day
Pre OEE Capacity	240.00	Item / Day
OEE Percent	80.00	%
Stations	2	Stn
Scrap Percent	10	%
OEE Input Percent	80	%

A0100 | #2 | Cutters

Inventory	15	Set

A0110 | #2 | Package | 1.00

Cycle Time	2	Min
Qty Per Cycle	1	Item
Capacity	228.00	Item / Day
Pre OEE Capacity	240.00	Item / Day
OEE Percent	95.00	%
Activity Time	8	Hr / Day
OEE Input Percent	95	%

A0120 | #2 | Boxes

Inventory	1000	Item

0.50 Day

420.00 Sec

5.00 Day

1 Drag out the appropriate add-ons for each center. Be sure to glue the add-ons to the center.

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Step 17: Hide/Show Cost Variables

1 Click the Views button in the toolbar. Views

Quick Mfg LT

Z0010	1
Time Summary	
Lead Time	10.85 Day
Total Value Added	17.00 Min
Value Added Percent	0.19 %
Takt Time	4.20 Min/Item
Total Cycle Time	17.00 Min

A0060	2
Spring Steel Rolls	
Inventory	10 Roll
Cumulative Cost	6.00 $/Item
Added Cost	300 $/Roll

A0070	2
Machine and form caliper springs	
1.00	
Cycle Time	4 Hr
Qty Per Cycle	1 Roll
Capacity	297.50 Item/Day
Pre OEE Capacity	350.00 Item/Day
OEE Percent	85.00 %
Added Cost	0.25 $/Set
Cumulative Cost	6.94 $/Item
Stations	2 Stn
Scrap Percent	10 %
OEE Input Percent	85 %

A0080	2
Springs	
Inventory	150 Set
Cumulative Cost	6.94 $/Item
Added Cost	0.00 $/Item

Z0020	2
Time Summary	
Lead Time	8.62 Day
Total Value Added	249.00 Min
Value Added Percent	3.44 %
Takt Time	4.20 Min/Item
Total Cycle Time	249.00 Min

2.50 Day — 14400.00 Sec — 0.75 Day

A0010	1
Casting Sets	
Inventory	1000 Set
Cumulative Cost	37.00 $/Item
Added Cost	37 $/Set

A0020	1
Machine	
1.00	
Cycle Time	3 Min
Qty Per Cycle	1 Set
Capacity	288.00 Item/Day
Pre OEE Capacity	320.00 Item/Day
OEE Percent	90.00 %
Added Cost	1 $/Set
Cumulative Cost	40.00 $/Item
Stations	2 Stn
Scrap Percent	5 %
Activity Time	8 Hr/Day
OEE Input Percent	90 %

A0030	1
Machined Sets	
Inventory	50 Set
Cumulative Cost	40.00 $/Item
Added Cost	0.00 $/Item

A0040	1
Polish	
1.00	
Cycle Time	5 Min
Qty Per Cycle	1 Item
Capacity	319.20 Item/Day
Pre OEE Capacity	336.00 Item/Day
OEE Percent	95.00 %
Added Cost	2 $/Set
Cumulative Cost	42.00 $/Item
Stations	2 Stn
OEE Input Percent	95 %

5.00 Day — 180.00 Sec — 0.25 Day — 300.00 Sec

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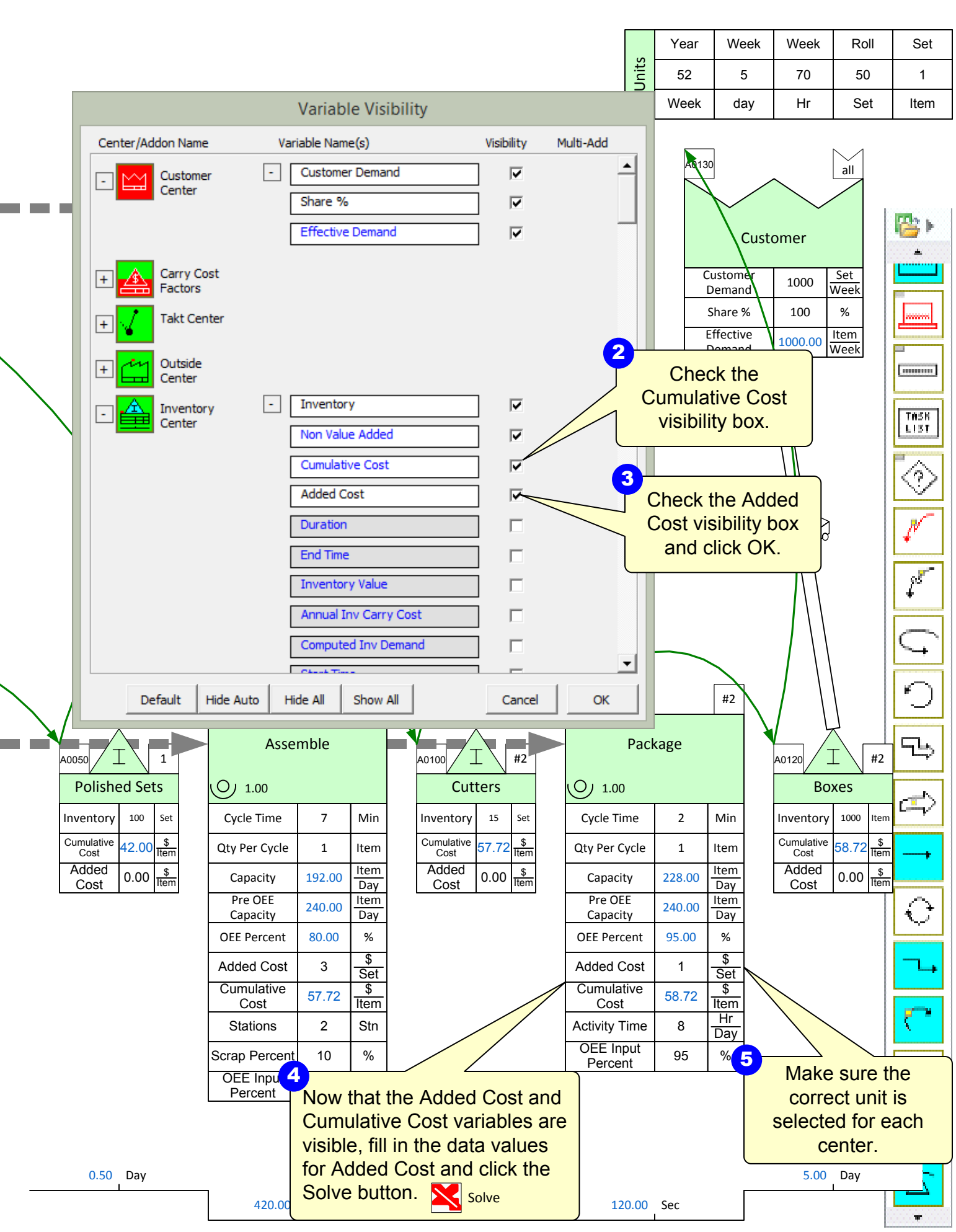

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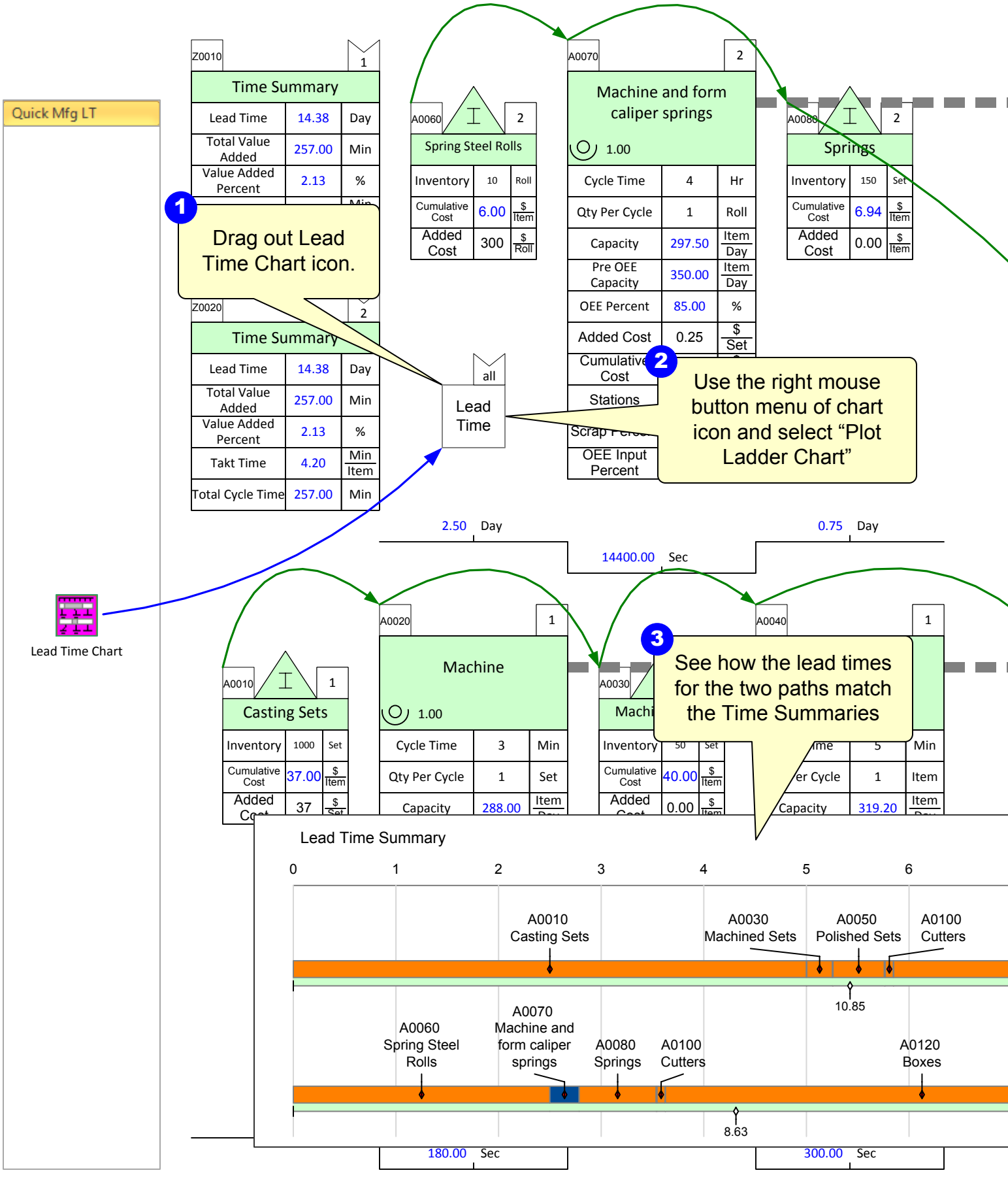
Step 18: Plot Lead Time Chart



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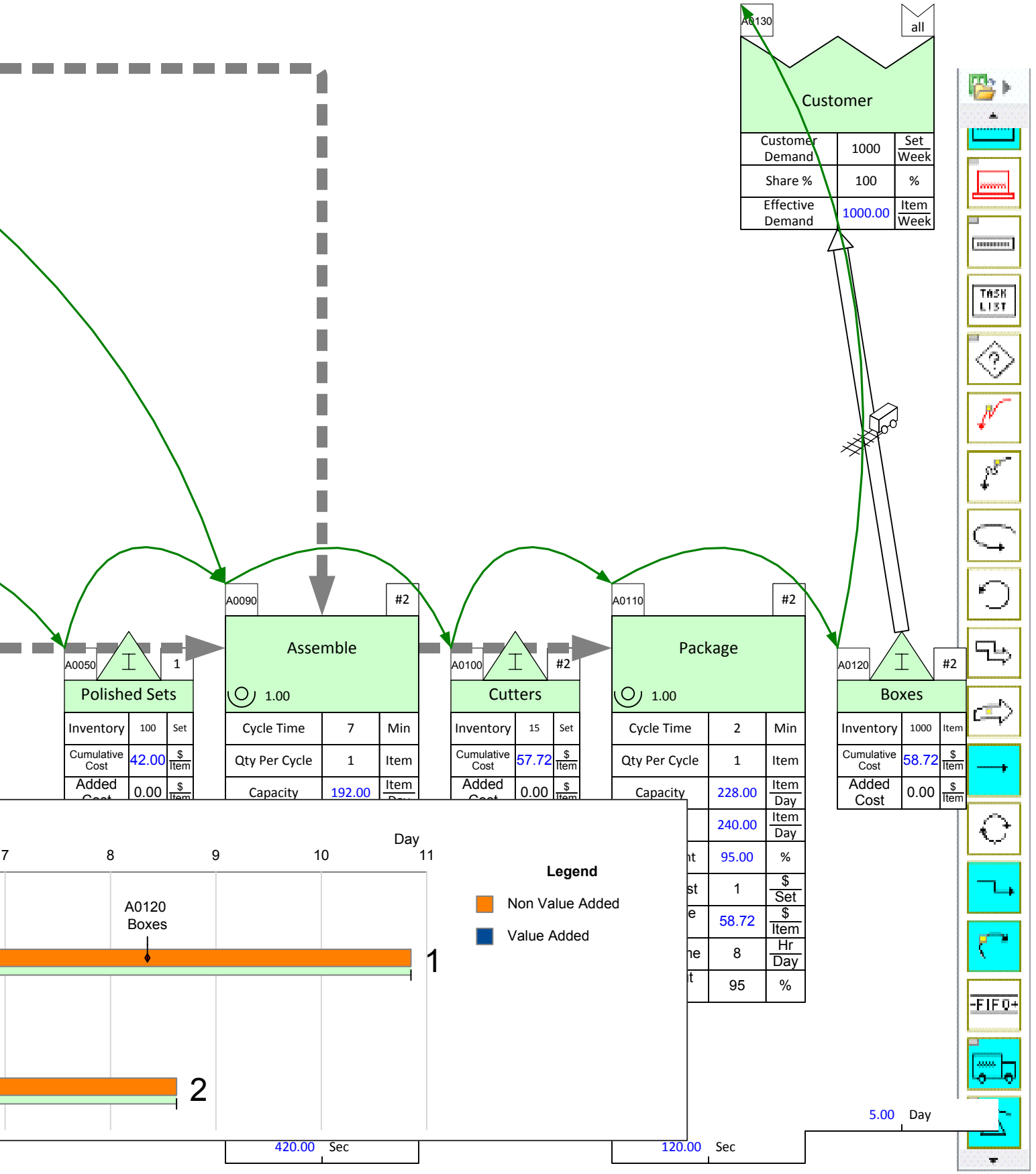
Units	Year	Week	Week	Roll	Set
	52	5	70	50	1
	Week	day	Hr	Set	Item



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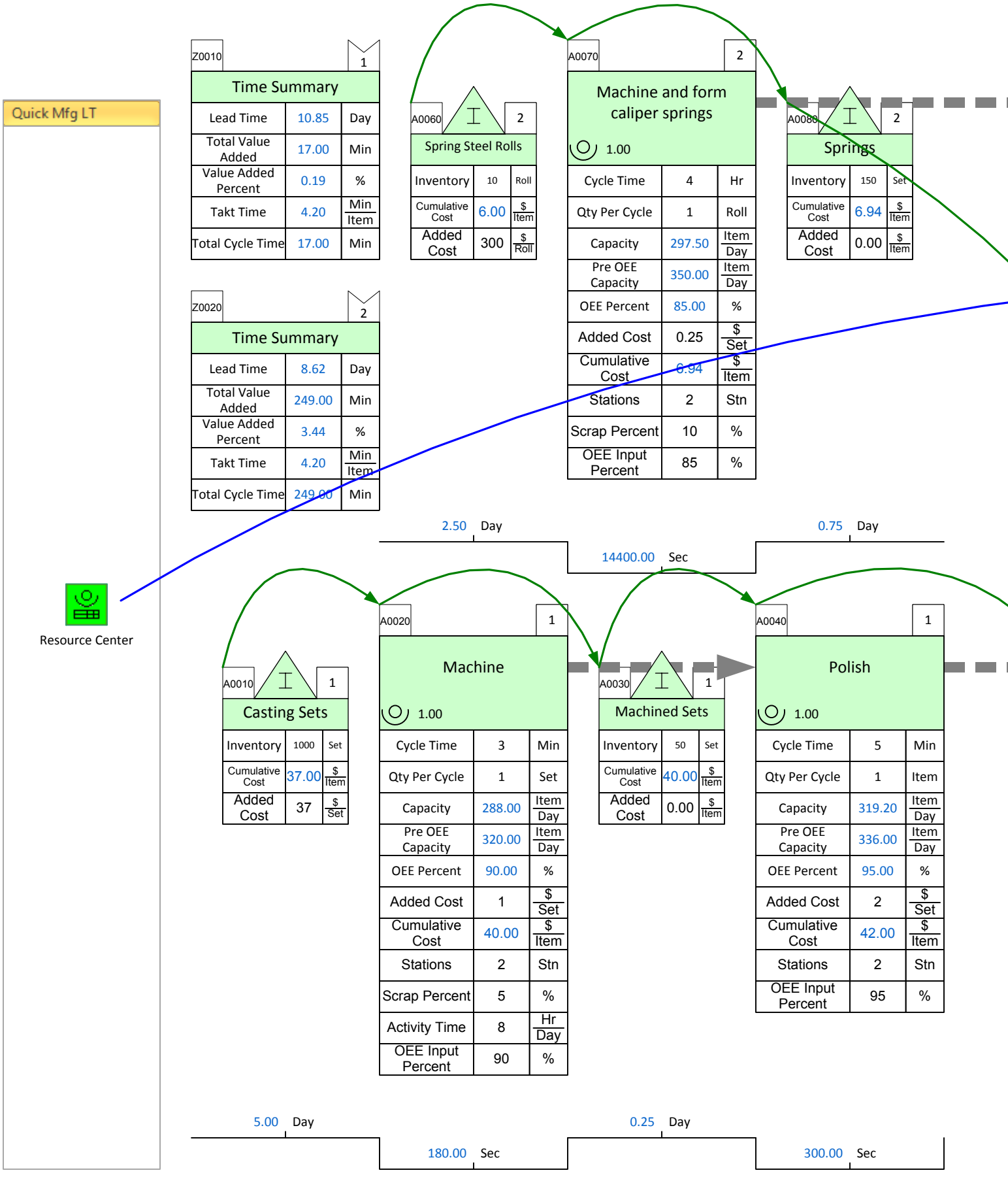
Step 19: Resource Modeling



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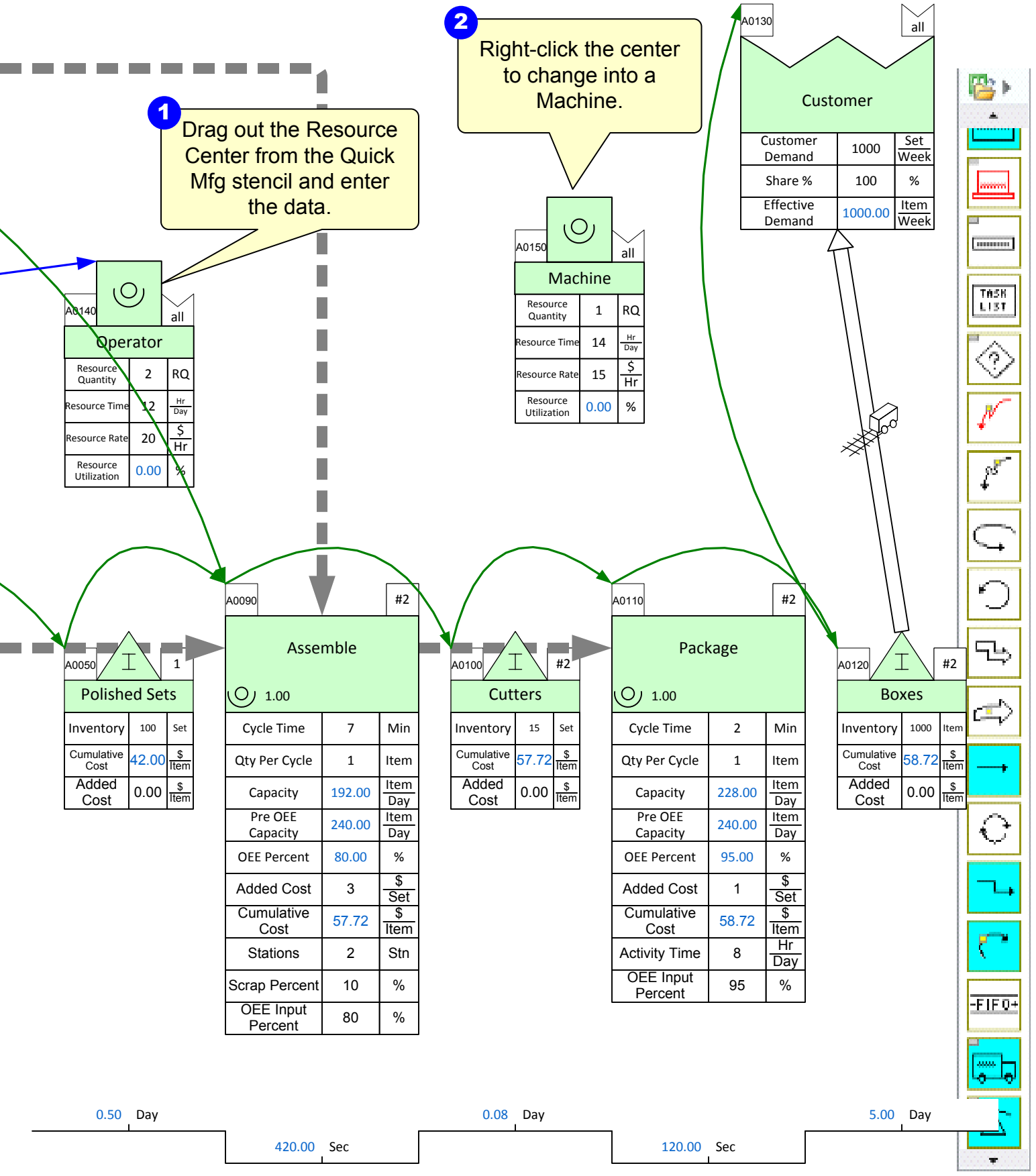
Units	Year	Week	Week	Roll	Set
	52	5	70	50	1
	Week	day	Hr	Set	Item



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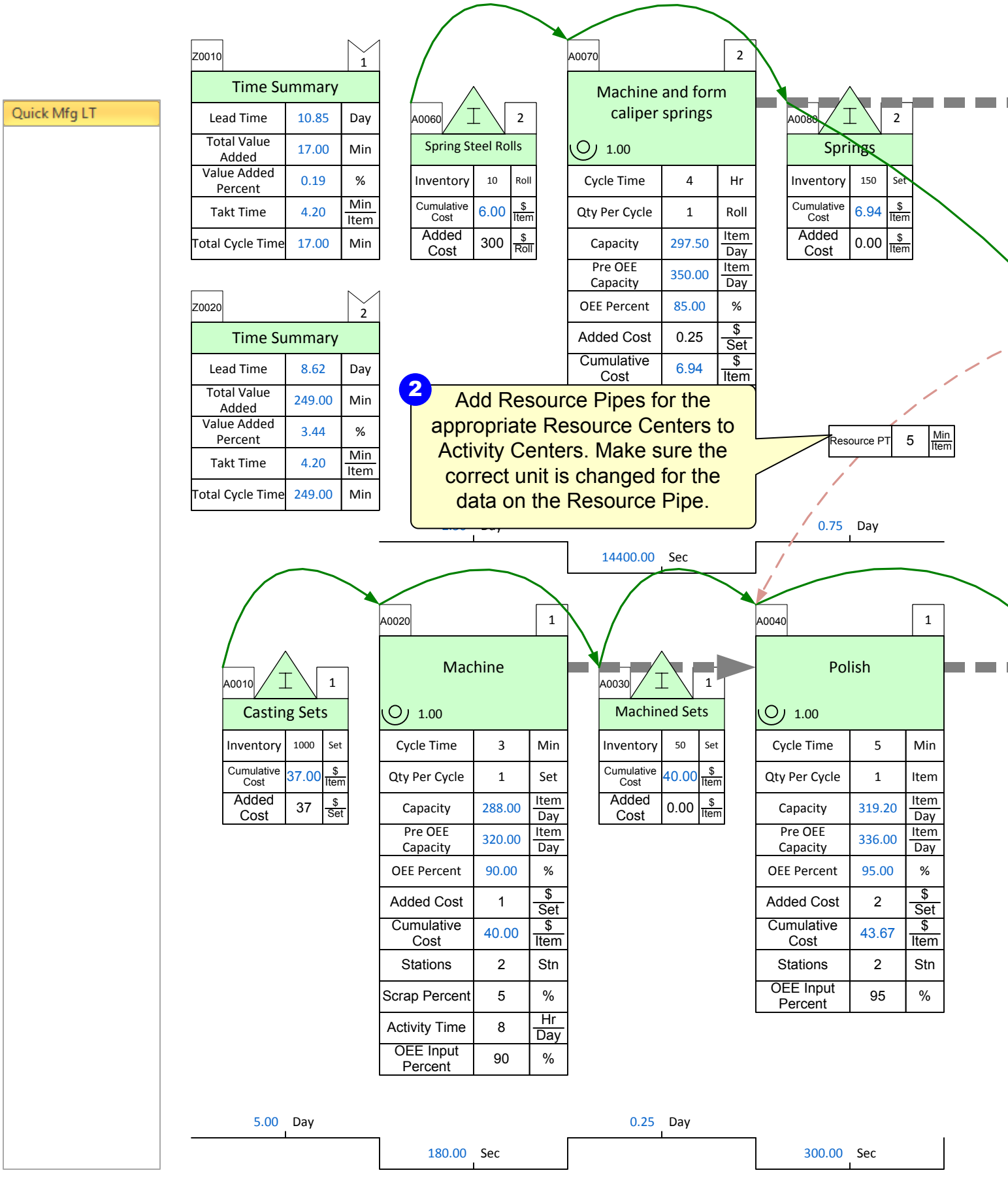
Step 20: Adding Resource Pipes



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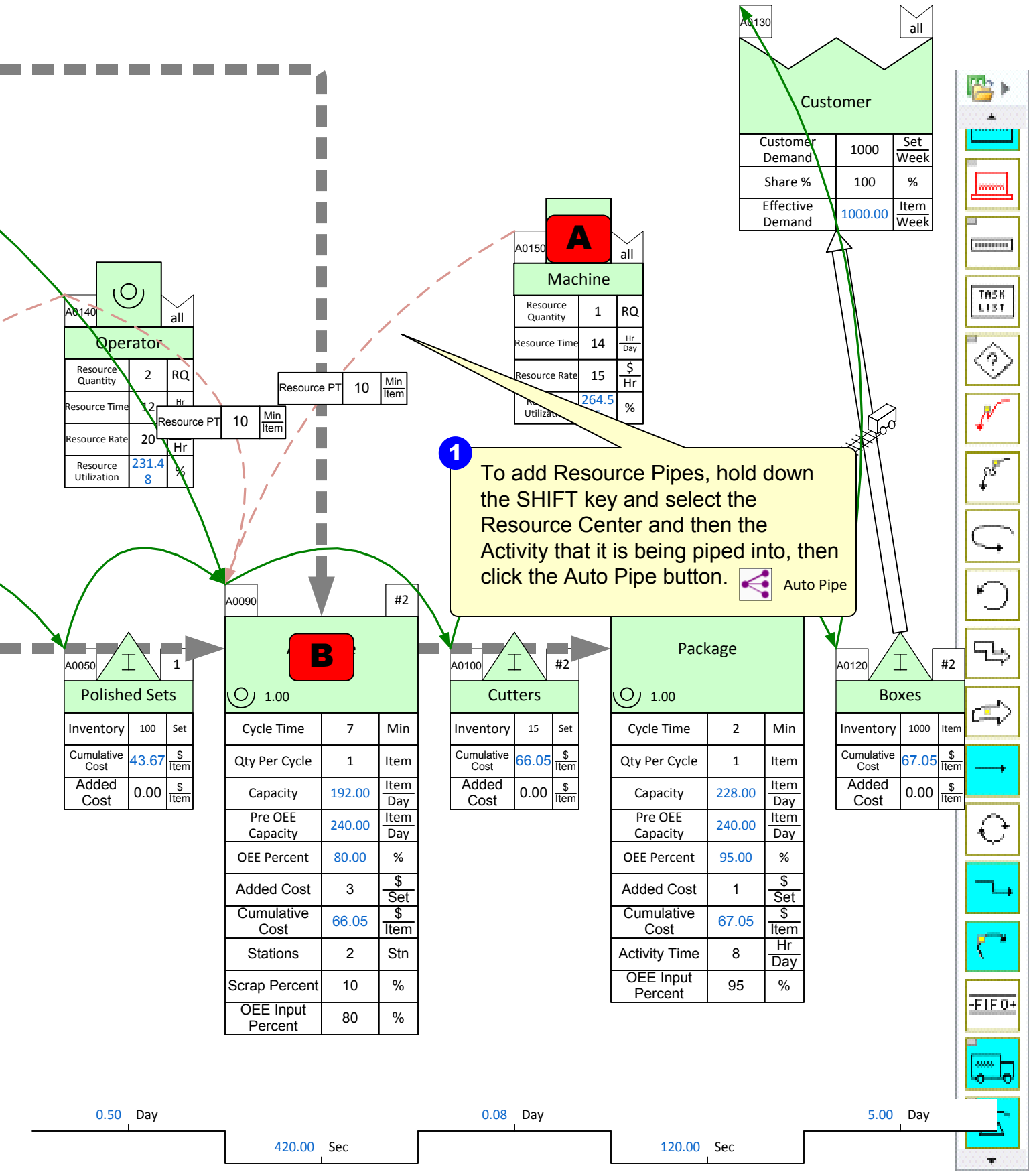
Units	Year	Week	Week	Roll	Set
	52	5	70	50	1
	Week	day	Hr	Set	Item



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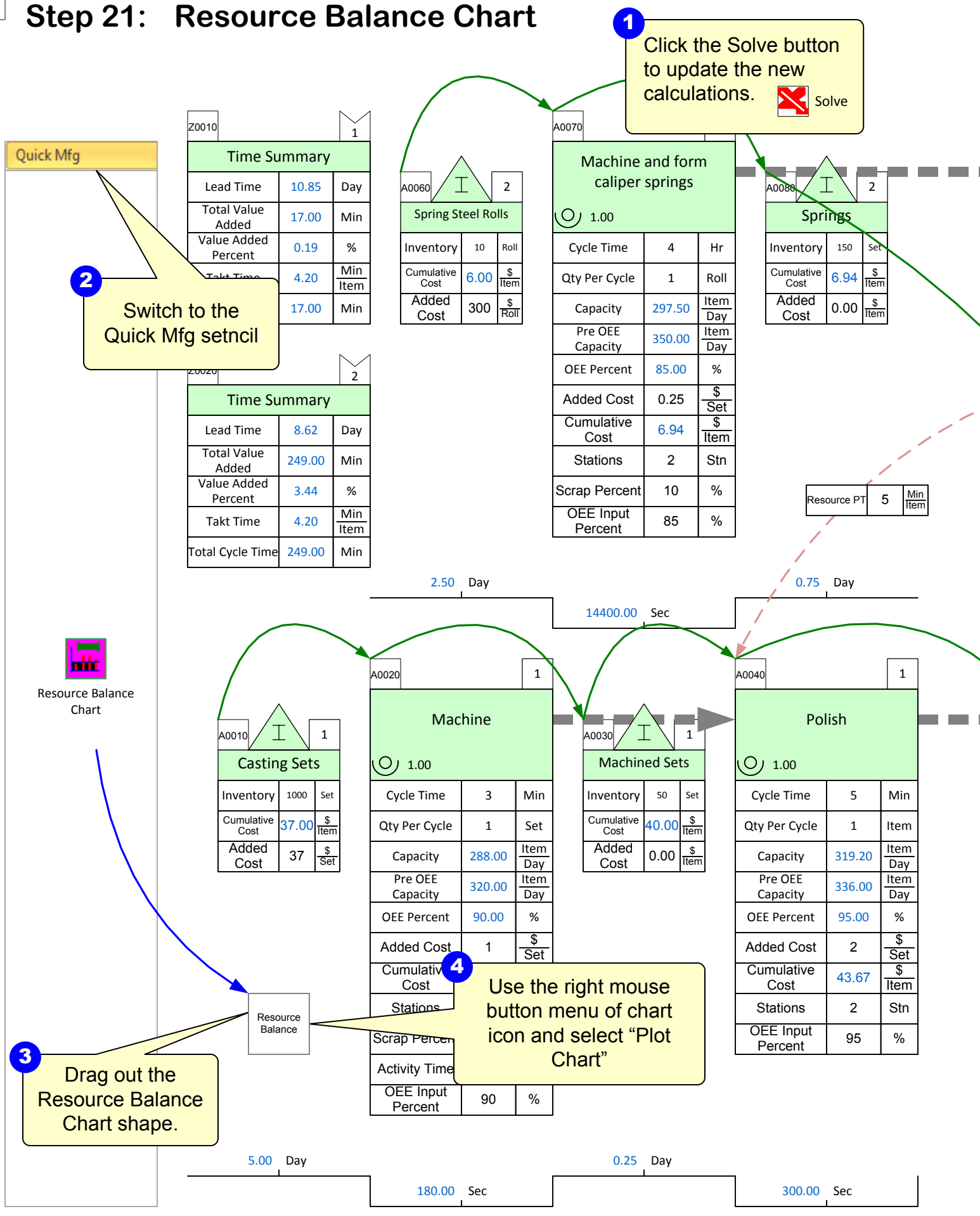
Step 21: Resource Balance Chart



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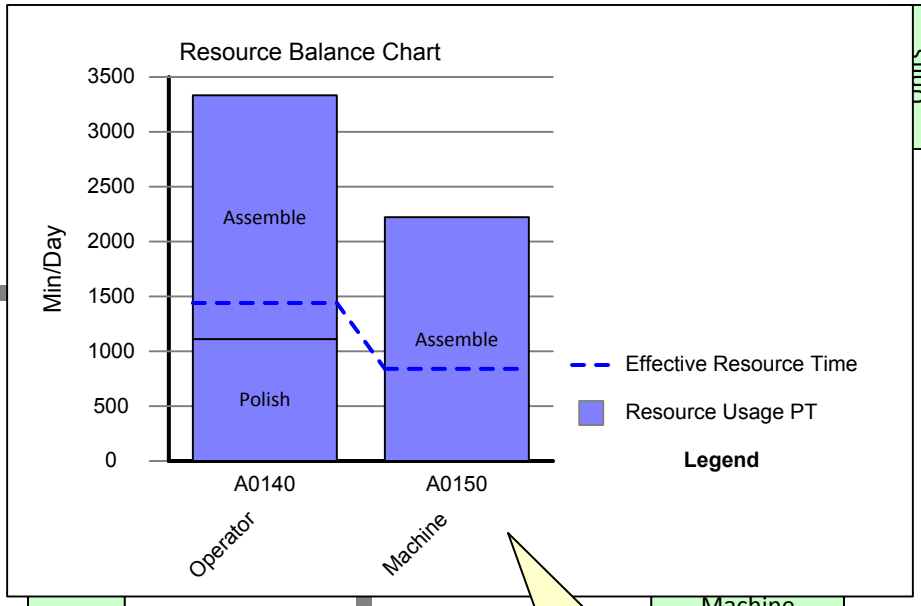

Units	Year	Week	Week	Roll	Set
	52	5	70	50	1
	Week	day	Hr	Set	Item

A0130 all

Customer

Customer Demand	1000	Set / Week
Share %	100	%
Effective Demand	1000.00	Item / Week

A0140 all

Operator

Resource Quantity	2	RQ
Resource Time	12	Hr
Resource Rate	20	Hr
Resource Utilization	231.48	%

Resource PT 10 Min/Item

Machine

	1	RQ
	14	Hr/Day
Resource Rate	15	$/Hr
Resource Utilization	264.55	%

Resource PT 10 Min/Item

5 Check the new chart

A0050 1

Polished Sets

Inventory	100	Set
Cumulative Cost	43.67	$/Item
Added Cost	0.00	$/Item

A0090 #2

Assemble 1.00

Cycle Time	7	Min
Qty Per Cycle	1	Item
Capacity	192.00	Item / Day
Pre OEE Capacity	240.00	Item / Day
OEE Percent	80.00	%
Added Cost	3	$ / Set
Cumulative Cost	66.05	$ / Item
Stations	2	Stn
Scrap Percent	10	%
OEE Input Percent	80	%

A0100 #2

Cutters

Inventory	15	Set
Cumulative Cost	66.05	$/Item
Added Cost	0.00	$/Item

A0110 #2

Package 1.00

Cycle Time	2	Min
Qty Per Cycle	1	Item
Capacity	228.00	Item / Day
Pre OEE Capacity	240.00	Item / Day
OEE Percent	95.00	%
Added Cost	1	$ / Set
Cumulative Cost	67.05	$ / Item
Activity Time	8	Hr / Day
OEE Input Percent	95	%

A0120 #2

Boxes

Inventory	1000	Item
Cumulative Cost	67.05	$/Item
Added Cost	0.00	$/Item

0.50 Day — 420.00 Sec — 0.08 Day — 120.00 Sec — 5.00 Day

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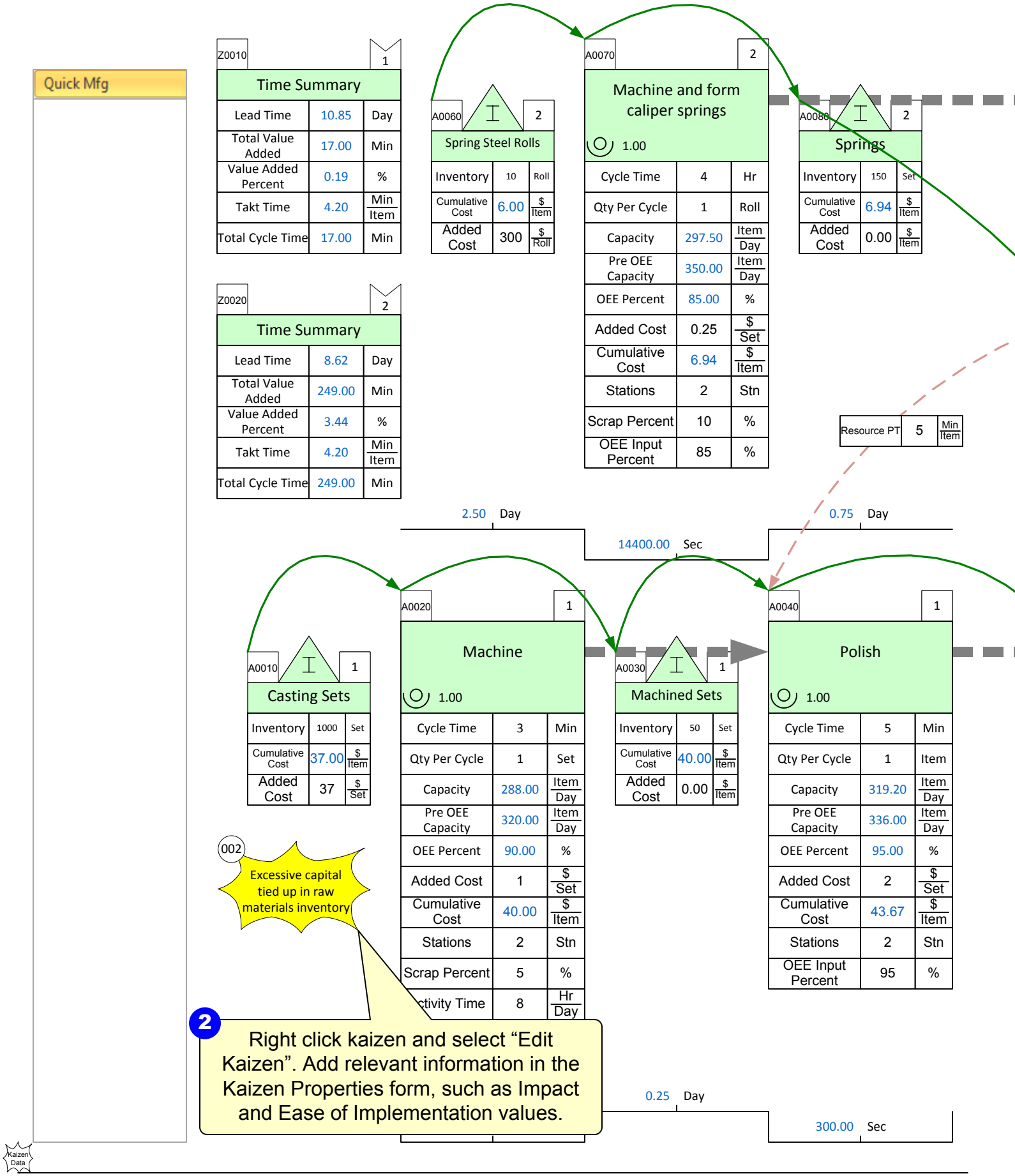
Step 22: Kaizen Improvements



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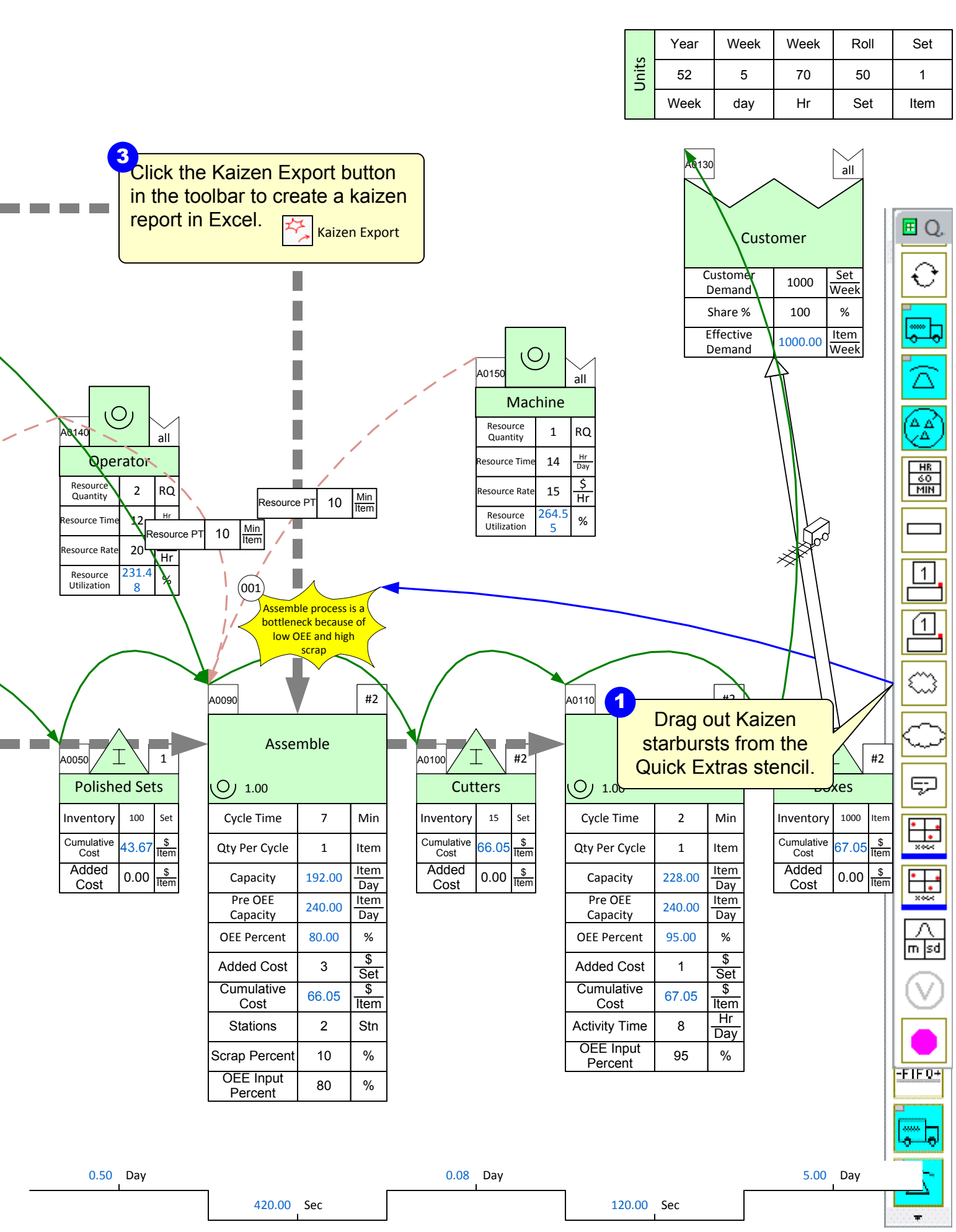

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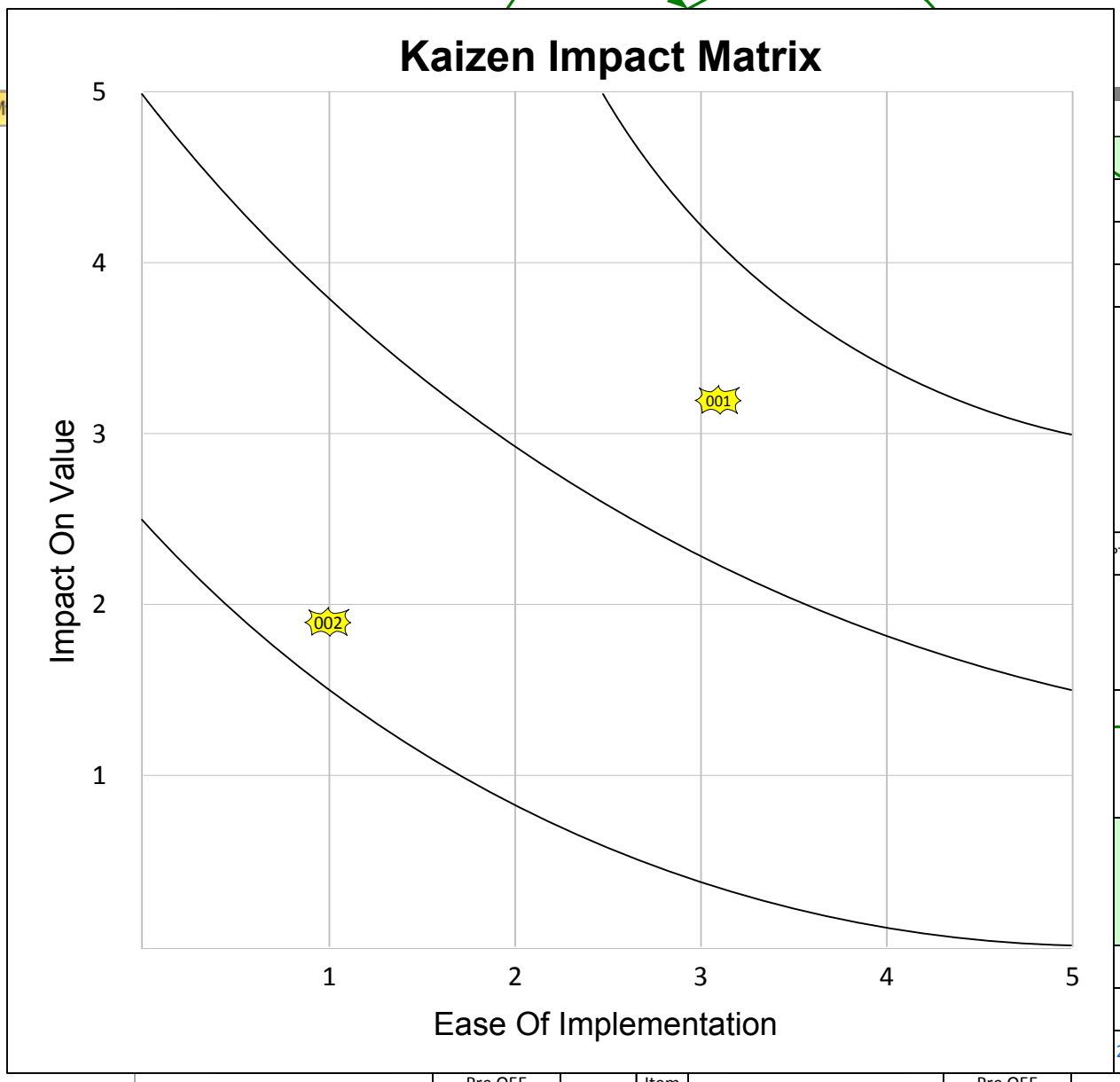
Step 23: Kaizen Impact Matrix



002

Excessive capital tied up in raw materials inventory

Pre OEE Capacity	320.00	Item / Day
OEE Percent	90.00	%
Added Cost	1	$ / Set
Cumulative Cost	40.00	$ / Item
Stations	2	Stn
Scrap Percent	5	%
Activity Time	8	Hr / Day
OEE Input Percent	90	%

Pre OEE Capacity	336.00	Item / Day
OEE Percent	95.00	%
Added Cost	2	$ / Set
Cumulative Cost	43.67	$ / Item
Stations	2	Stn
OEE Input Percent	95	%

5.00 Day

180.00 Sec

0.25 Day

300.00 Sec

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Units	Year	Week	Week	Roll	Set
	52	5	70	50	1
	Week	day	Hr	Set	Item

1 Drag out the Kaizen Impact Matrix and right-click to plot.

Kaizen Impact Matrix

A0130 all

Customer

Customer Demand	1000	Set / Week
Share %	100	%
Effective Demand	1000.00	Item / Week

A0150 all

Machine

Resource Quantity	1	RQ
Resource Time	14	Hr / Day
Resource Rate	15	$ / Hr
Resource Utilization	264.55	%

A0140 all

Operator

Resource Quantity	2	RQ
Resource Time	12	Hr
Resource Rate	20	Hr
Resource Utilization	231.48	%

Resource PT 10 Min / Item

Resource PT 10 Min / Item

001 Assemble process is a bottleneck because of low OEE and high scrap

A0050 1

Polished Sets

Inventory	100	Set
Cumulative Cost	43.67	$ / Item
Added Cost	0.00	$ / Item

A0090 #2

Assemble 1.00

Cycle Time	7	Min
Qty Per Cycle	1	Item
Capacity	192.00	Item / Day
Pre OEE Capacity	240.00	Item / Day
OEE Percent	80.00	%
Added Cost	3	$ / Set
Cumulative Cost	66.05	$ / Item
Stations	2	Stn
Scrap Percent	10	%
OEE Input Percent	80	%

A0100 #2

Cutters

Inventory	15	Set
Cumulative Cost	66.05	$ / Item
Added Cost	0.00	$ / Item

A0110 #2

Package 1.00

Cycle Time	2	Min
Qty Per Cycle	1	Item
Capacity	228.00	Item / Day
Pre OEE Capacity	240.00	Item / Day
OEE Percent	95.00	%
Added Cost	1	$ / Set
Cumulative Cost	67.05	$ / Item
Activity Time	8	Hr / Day
OEE Input Percent	95	%

A0120 #2

Boxes

Inventory	1000	Item
Cumulative Cost	67.05	$ / Item
Added Cost	0.00	$ / Item

0.50 Day — 420.00 Sec — 0.08 Day — 120.00 Sec — 5.00 Day

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