Exercise 3

Process Commonality
For Product Families

In this Exercise, we will use a quantitative technique to determine whether a given group of products can be built successfully on a Mixed Model Flow Line, given the commonality of their required processes. This technique will highlight some likely groupings, and some potential problems, within our design scope of nine products. The technique is particularly useful for companies with hundreds of products, allowing an efficient "first sort" of numerous PFDs.

Will it be possible to build all the pTool saws, drills and sanders on the same line? So far, you do not know. The procedure shown below will take you through the steps for generating Product Family Scores for our products. We'll then sort these scores into groupings by Family, based on Process Commonality – one of the three criteria for assigning products to a Mixed Model line. You'll then discuss with your Coach whether or not all of the products belong in the same family.

Sorting by Product Family (Using Excel)

Step 1. Copy your Excel Process Matrix to a new worksheet.

Step 2. Add a row directly above the process names, and number them 1 through n, with n being the total number of processes – 9 in this case.

Step 3. Replace each "X" in the spreadsheet with the process number for that column. Make sure that the cells are formatted as numbers and not as text.

Step 4. Create a column to the right of the last process, and title it "Family". For each product row, sum the cell value to the power of the column value (cell^col). The sum statement for the seventh row, with seven processes, will look like this (without the spaces): = B7^B$2 + C7^C$2 + D7^D$2 + E7^E$2 + F7^F$2 + G7^G$2 + H7^H$2.

Step 5. Sort the entire spreadsheet on the "Family" column. This will group products according to the calculated "family values". Note that the family value has no meaning other than as a sorting device for process similarity.

Step 6. Review what the groupings tell you, referring as well to the Process Flow Diagrams from Exercise 2. Keep in mind that it is not necessary to have exactly the same family value to be included or excluded from a product family. Similar values indicate that the process flow for those products is also similar, increasing the likelihood that they will work well together on a Mixed Model line. Finally, remember that several products might share Process Commonality, but have highly variable labor content or parts requirements. Set this aside – you will use in in Exercise 9.

PROCESS MATRIX / Family Sort for Process Commonality
(Layout for Excel)

			1	2	3	4	5	6	7	8	9	
P/N	DESCRIPTION	VOL	Mold	Grind	Wiring Assy	E-Test	Mandrel Assy	Motor Assy	Final Assy	Test	Pack	FAMILY
DR12	Drill		1		3	4		6	7	8	9	
DR54	Drill											
DR11	Drill											
SD04	Belt Sander											
CS87	Circular Saw											
OS31	Orbital Sander											
OS01	Orbital Sander											
CH96	Chain Saw											
CH09	Chain Saw											