

Minicase: BF Swings II

Ben Floyd really enjoyed wood shop in high school, so he used an inheritance to buy some basic woodworking tools. He started out doing odd jobs, and then one day he made a porch swing for his house. Several people saw it and asked him to make one for them. Word of mouth brought him many customers. In June of 1991 he married Bobbie Ruth, a marketing graduate. Bobbie Ruth saw a chance to expand the swing business to similar products and eventually have hardware, building supply, and furniture stores. Thus, BF Swing was born. Due to his love of his work and Bobbie Ruth's marketing ability, the business prospered. Today, they make stools and rockers as well as swings. The company now employs about 35 people five days a week with sales close to \$1.4 million dollars.

Ben is concerned with production for the next few months, and he assigns you to come up with a four-week production plan. Part of his motivation is that he thinks there is too much inventory. Samir, the forman, contends that cannot be true, because the storage area is limited, and there can never be more than 500 total items in storage at any one time. Another motivation is that Lupe, the accountant, tells him that overtime costs are a large part of his total operating costs.

Chan, from the personnel, thinks they ought to hire more workers to alleviate overtime. When asked, Chan admits it will cost \$1000 per worker to train them, and their wages are \$400 per week. Bobbie Ruth points out that, by law, any worker laid off must be paid three weeks' separation pay. Overtime costs are approximately double the cost of regular time in each department and that overtime work can be at most three hours a working day (Monday to Friday) and 6 hours on Saturday. Samir also reminds them that adding people might not add capacity, because additional equipment may also be needed. Ben agrees with this except in the case of sanding, assembly, and finishing, which require little or no equipment. Therefore they conclude that hiring only make sense in these 3 departments.

Thanks to Bobbie Ruth's foresight, some data are available. The following table gives the standard processing time (in minutes) for each "operation" of the three products. It contains the expected time available in each department per worker. (Time for preventative and unexpected maintenance is already excluded.) The number of employees currently working in the department is also provided, as well as the average costs per hour (including labour and machine costs).

Department	Processing time (minutes)			Available		Cost in \$/hour
	Stool	Rocker	Swing	Hours/Worker/Week	Workers	
Drill	7	10	11	35	2	12
Lathe	15	0	0	35	1	15
Crosscut saw	3	16	10	35	3	12
Rip saw	0	3	4	35	1	12
Mortise	0	10	8	35	2	20
Tenon	0	22	11	35	3	20
Router/shaper	0	3	3	35	1	15
Plane	0	13	7	35	2	15
Sand	5	25	35	36	4	10
Assemble	12	30	45	37	4	10
Finish	5	15	22	40	2	10

Inventory holding costs per week are \$0.30, \$0.80, and \$0.90 per unit-week. Currently, there are 70 stools, 255 rockers, and 110 swings in inventory. The forecasted demands for products in the next four weeks are as follows:

Week	Stools	Rockers	Swings
1	100	344	24
2	109	352	146
3	90	368	279
4	106	361	64

Develop a four-week production plan for BFS. What important decisions need to be made? What level of detail is needed? If the plan is an aggregate plan, should products, processes, or both be aggregated? What solution method seems the best?