Statement of the problem case study sample

Business, Company

This paper is devoted to determining the optimal plan of product of two shelves types, S and LX. It highlights which combination of shelves will allocate optimally the capacity available to help the organization maximize its total profits. Besides, it undertakes to carry out sensitivity analysis to help in understanding how total profits changes as selected inputs are changed, that is, the selling price and the material cost.

Executive summary

The problem of Shelby Shelving revolves around to determining the optimal plan of product of two shelves types, S and LX. It highlights which combination of shelves will allocate optimally the capacity available to help the organization maximize its total profits. Besides, the sensitivity analysis undertaken provides an insight of how the company's profits changes as chosen inputs are changes, i. e. selling price and material cost. The major issue is the determination of optimal decision variables, i. e. the number of production units for every shelve model that helps the company maximize its profits and work in line with the resource constraints, i. e. hours available for stamping and forming, capacity of the assembly. Excel Solver used to help optimize the maximum profit using the programming (LP) model. The model optimizes allocation of resources so that the company's total profit is maximized. Sum of every product profit less fixed costs gives the total profit. Total cost is the sum of variable costs and fixed costs. Direct materials, overhead cost and direct material cost per unit constitute variable costs. The monthly constant cost is the fixed cost and does not vary with level of production units. Such costs like assembly process costs, forming costs, and stamping costs are fixed costs. The aim is to draw an optimal product mix

decision for optimal profit maximization under the available resource constraints.

Based on the information on limited resources, cost calculation, price and process analysis, it is evident that model S contribution's margin is higher than that of model LX. Consequently, for production mix optimization, all the available resources should be allocated for production of model S to the maximum capacity of production. The resources left should be allocated for model LX production. For total profit maximization, the plan of production should have 1, 900 model S units and 650 units for Model LX. This gives a monthly total profit of $268, 250.

Since model S contribution's margin ($260/set) is higher than that of Model LX ($245/set), maximizing model S production is thus appropriate to maximize total profit. Since assembly and forming of model S does not have excess capacity, the processes appear as bottleneck to profit and production increment. Basically, forming step is major bottleneck as it takes place before assembly step. If constraint limit of forming process is increased from 800 to 801 hours, total profits likewise increases from $268, 250 to $268, 740, a total of $490 in profit increment. It is a result of increasing production of model LX to 652 from 650 times the contribution margin ((2 sets X $245/set = $490). As shown in table 2, increasing the cost of material for Model S by $100/set leaves the production constant, i. e. Model LX = 650 units and Model S = 1900 units. Nonetheless, total monthly profit decreases from $268, 250 to $78, 250. An increase in material cost of model S reduces its contribution margin to $160/unit from $260/unit. If selling price of model

LX is increased from $2, 100 to $2, 400, monthly production plan changes to be: model S, 400 units and Model LX, 1, 400 units resulting in total monthly profit increase from $268, 250 to $482, 000. This is because Model LX price of $300/set increases its contribution margin from $245/unit to $545/unit. Therefore, it is appropriate to maximize production of Model LX due to its higher contribution margin.