Supply chain management - operation management

Business, Management

Supply Chain Management – Operation Management submitted) Case 2: Aggregate Planning for a Bottling Company Month May Jun Jul Aug Sept Oct Forecast (tankload) 50 60 70 90 80 70 The company production line breakdown is shown in the table below: Regular Basis Overtime Subcontracting Holding tankload/month Demand Backorder/month The company produces 60 tankloads/month Cost of Production $ 1, 000 per tankload $ 1, 600 per tankload $ 1, 800 per tankload $200 per tank load $ 5, 000 per tankload Solution a) Level production supplemented by up to 10 tankloads a month from overtime Month May Jun Jul Aug Sept Oct Total Forecast 50 60 70 90 80 70 420 Output Regular 60 60 60 60 60 60 360 Overtime 10 10 10 10 10 10 60 Output -forecast 20 10 0 -20 -10 0 0 Inventory Beginning 20 30 30 10 0 Ending 20 30 30 10 0 0 Average 10 25 30 20 5 0 90 Backlog 0 0 0 0 0 0 0 Costs Regular @1, 000 60, 000 60, 000 60, 000 60, 000 60, 000 60, 000 360, 000 Overtime @ 1, 600 16, 000 16, 000 16, 000 16, 000 16, 000 16, 000 96, 000 Inventory @ 200 1, 000 5, 000 6, 000 4, 000 1, 000 0 17, 000 Backorders @ 5, 000 0 0 0 0 0 0 0 Total 77, 000 81, 000 82, 000 80, 000 77, 000 76, 000 473, 000 (Graves, Kan, & Zipkin, 1993) b) A combination of overtime, inventory holding, and subcontracting Month May Jun Jul Aug Sept Oct Total Forecast 50 60 70 90 80 70 420 Output Regular 60 60 60 60 60 60 360 Overtime 20 10 10 10 50 Subcontract 10 10 Output-Forecast 10 20 -10 -20 0 0 0 Inventory Beginning 0 10 30 20 0 0 Ending 10 30 20 0 0 0 Average 5 20 25 10 0 0 60 Backlog 0 0 0 0 0 0 Costs Regular @1, 000 60, 000 60, 000 60, 000 60, 000 60, 000 60, 000 360, 000 Overtime @ 1, 600 0 32, 000 0 16, 000 16, 000 16, 000 80, 000 Subcontract @ 1, 800 0 0 0 0 18, 000 0 18, 000 Inventory @ 200 1, 000 4, 000 5, 000 2,

000 0 0 12, 000 Backorders @ 5, 000 0 0 0 0 0 0 0 Total 61, 000 96, 000 65, 000 78, 000 94, 000 76, 000 470, 000 (Arora, 2004) c) Using overtime for up to 15 tankloads along with inventory holding to handle variations Month May Jun Jul Aug Sept Oct Total Forecast 50 60 70 90 80 70 420 Output Regular 60 60 60 60 60 60 360 Overtime 15 15 15 15 60 Output-forecast 25 15 5 -15 -20 -10 0 Inventory Beginning 0 25 40 45 30 10 Ending 25 40 45 30 10 0 Average 12. 5 32. 5 42. 5 37. 5 20 5 150 Backlog 0 0 0 0 0 0 0 Costs Regular @1, 000 60, 000 60, 000 60, 000 60, 000 60, 000 60, 000 360, 000 Overtime @ 1, 600 24, 000 24, 000 24, 000 24, 000 96, 000 Inventory @ 200 2, 500 6, 500 8, 500 7, 500 4, 000 1, 000 30, 000 Backorders @ 5, 000 0 0 0 0 0 0 0 Total 86, 500 90, 500 92, 500 91, 500 64, 000 61, 000 486, 000 (An & Fromm, 2005) The production strategy that should be adopted by the production managers that would minimise the cost of producing the tankloads in six months is the production strategy in part b (Where overtime, inventory holding, and subcontracting have been combined) since the total cost incurred therein is $ 470, 000. In contrast to part a and part c where the total cost of production is higher i. e. $ 473, 000 and $ 486, 000. Aggregate planning is quite essential in every production plant. This is so because the decisions made therein are often strategic decisions under which operating decisions are made (Kouvelis, Dong, Boyabatli, & Li, 2011). The aggregate planning is often shared with the supply chain partners since it has a great impact on the supply chain. All the stages within the supply chain ought to work hand in hand in order to improve the supply chain performance. This is quite essential because it would help synchronize the flow of operations throughout the supply chain (Boyer & Verma, 2009). The information that

would be better shared with the supply chain partners is the vendor managed inventory because vendors are known to undertake the duty of planning on behalf of the trading partners. My main reason for such a decision is to minimize the safety stock as a buffer on the vendor side due to the uncertainty in demand as well as minimize the safety stock on the consumer side due to uncertainty in supply (Liu & Kumar, 2003). The supply chains partners will have to ensure that there is collaboration between the overtime, inventory holding and the subcontractors. This would ensure that there is a smooth running in the daily operations of production. The management will have the right information from the suppliers on the number of tankloads that ought to be produced. This ensures that the company does not incur costs in excessive production that would make the plan seem costly. In case the aggregated plan is not achieved, a special handling process ought to be adopted so that the process of production is not slowed down, but met as anticipated within the six months. The slowness of the process is a backlog to the production section of the company. However, from the calculations above the aggregate planning in part b does not experience any backlog in its production process. This is a clear indication that the balance between the supply and demand is quite steady, and the bottling company would minimise costs greatly under this type of aggregate planning. Strategic sourcing is, as well, information that ought to be shared herein. Since the production of tankloads involves a chain of suppliers, sourcing becomes a complex match making procedure. The company management needs to source for suppliers that would offer the company production section with the most affordable resources that would

not inflate the costs. The combined process of efforts from subcontractors, working overtime and the inventory holdings varies in its structure from chronological sharing. It actually helps as the stock turnover is on the rise thus counters the costs incurred in the production. The success in information sharing throughout the supply chain, starting from demand forecast to order fulfilment, will see the Bottling Company minimise costs using this production strategy. Being that it is the most cost effective strategy; the company will adopt it in the next six months while sharing the essential information with the supply chain partners in order to meet the objectives set by the company bosses. References An, C., & Fromm, H. (2005). Supply Chain Management on Demand: Strategies and Technologies, Applications. Hoboken: Springer. Arora, K. (2004). Production and Operations Management. New York: Firewall Media. Boyer, K. K., & Verma, R. (2009). Operations & Supply Chain Management for the 21st Century. Berlin: Cengage Learning. Graves, S. C., Kan, R., & Zipkin, P. H. (1993). Logistics of production and inventory. Amsterdam: Elsevier. Kouvelis, P., Dong, L., Boyabatli, O., & Li, R. (2011). Handbook of Integrated Risk Management in Global Supply Chains. New Jersey: John Wiley & Sons. Liu, E. R., & Kumar, A. (2003). Leveraging Information Sharing To Increase Supply Chain Configurability. Twenty-Fourth International Conference on Information System (pp. 523-537). Pennsylvania: Penn State University.