Sample Answers to In-Text Questions

# Chapter 7: Capacity Planning

## Discussion Questions

1. What is the difference between effective capacity and design capacity?

Answer: Design capacity is the maximum rate of output achieved by an operation, a process, or a manufacturing or service facility that is producing under ideal conditions. Effective capacity is the capacity that can be achieved given the actual changes in product mix, machines and equipment that require periodic maintenance, scheduling changes, and workers who take time off for lunch, absences, and other needs. Effective capacity is typically less than design capacity.

1. Why is it important to consider both capacity utilization and capacity efficiency measures when evaluating a firm’s capacity performance?

Answer: Efficiency tells us how well the effective capacity is being used. Utilization tells us how well the design capacity of the equipment is being used. Together they tell us how well the capacity is balanced.

1. What are capacity cushions, and why do companies need them?

Answer: a capacity cushion is extra capacity that is not needed in the short term forecast of demand. A capacity cushion, while it may be less than optimally efficient, allows a company to take advantage of large or custom orders, and makes the company more agile.

1. Briefly discuss the caveats that companies should be aware of when developing capacity alternatives.

Answer: A leading strategy might be inefficient if a forecast increase in demand does not materialize. A lagging strategy might be risky, if the customers are not willing to have backorders, and move their business to another customer, etc.

1. Discuss the factors that make capacity planning in supply chains difficult.

Answer: Sharing information is more difficult, acquisition of capacity of a s/c partner, is a decision solely of that company, and because of the bullwhip effect, orders flow through the chain in a jerky manner.

1. What are some of the unique capacity planning challenges that service companies face?

Answer: In the service industry, a lack of capacity usually means excess waiting by the customer. Capacity must be in close proximity to the customer. Volatility of demand is a concern, and you never know what exact demand for services is going to walk through the door.

1. Discuss briefly the steps involved in capacity planning for services

Answer: 1. Determine the service level requirements, 2. analyze the current capacity, and 3. plan for the future to have the right capacity in the right place.

1. Discuss briefly the various aspects of capacity planning for a service facility such as a hospital.

Answer: Student examples will vary.

1. What are supply chain contracts and how are they used to address capacity-related issues?

Answer: The buyer might want to influence the amount of capacity their supplier will make available to them. A revenue sharing contract or a capacity reservation contract might help to share the risk of purchasing extra capacity.

1. Explain how capacity can be managed to implement sustainability principles

Answer: Sustainability practices can focus on the more efficient use of existing capacity by buying more energy efficient equipment, and reducing waste and better use of the 3 R’s.

1. What are some of the challenges of global capacity management?

Answer: It is hard enough when members of the supply chain are different companies, let alone in different countries and cultures. More organizations are involved. It increases the need for good communications and data sharing. Risks must be shared creatively between partners and regions. Since response time is paramount in global operations, more capacity cushions are usually required to make movement smooth.

1. Discuss briefly the three key elements of the global capacity management process.

Answer: Determining capacity needs in the system, capacity monitoring, and constraint management all need to be part of a global program.

## Critical Thinking Exercises

1. Highlight some of the capacity planning challenges that Fiat faces with their Betim factory and desire to grow their markets in South America. How does the efforts to increase capacity lead to the identification of production bottlenecks? Give examples.

Answer: Capacity increases mean new buildings and new equipment with financial restructuring, new technologies, and logistics process improvement. A surge in capacity requirements usually exposes bottleneck operations. For Betim, it was the paint capacity and old processes, that will have to be restructured.

1. What are some of the challenges with increasing production capacity at older plants?

Answer: It is difficult to increase capacity with old equipment, processes, layouts and technology. Many factories have had to add significant upgrades to older plants.

1. How can local government initiatives help a company like Fiat with its capacity planning challenges?

Answer: Govt. initiatives are important, if they entice a company to spend on energy efficient equipment, or energy efficient product design, etc. and help with the costs.