Sample Answers to In-Text Questions

# Chapter 9: Process Design and layout

## Discussion Questions

1. This chapter suggests that capacity planning and process selection serve as a link between external, market-driven demands and internal operational processes. Why is this the case?

Answer: You have to align the processes and the Capacity plans with the changing market conditions. A big decision is how to accomplish the goals by the mix of in-house processes and outsourcing. It is all interdependent.

1. Under what circumstances would an organization consider producing a component in-house versus outsourcing it?

Answer: By the combination of factors like capacity, core competencies, reliability, risk management, (such as control issues, or IP copy capability), and costs.

1. Given examples of products that can be produced using the following process types:
   1. project
   2. job-shop
   3. batch
   4. repetitive
   5. continuous flow

Answer: Student examples will vary.

1. Why might an organization consider using agile manufacturing? What pressures could the firm be facing? What advantages and disadvantages would it receive from using it?

Answer: Agile manufacturing is for responding quickly to market changes. The firm might be facing large swings in demand, and more pressure to customize products. Advantages center around being able to meet requests for customization, or for unusually larger or smaller orders. The downside of agility might be higher costs due to process changes, or higher capacity cushions.

1. How has the rise in automation dramatically altered the ways in which an organization develops its flow of processes? Give examples of automation and the subsequent changes that have occurred in a process.

Answer: Fixed automation is appropriate for larger volumes and fixed process flows. Flexible automations is more for low volumes in small batches. Student examples could be widely variable.

1. Explain the service process design matrix. How can organizations use it when examining their service processes?

Answer: It can be a 4-up chart describing high or low customer interaction, (and therefore customization), compared with high or low labor intensity. They can look at their processes and determine whether to use more of a service shop, service factory, mass services, etc. the way that goods production uses the product process matrix for designing processes.

1. Explain the following manufacturing methods and give an example of each one:
   1. make-to-stock – consumer package goods
   2. assemble-to-order – PC’s and electronics
   3. make-to-order – industrial products with a long lead time
   4. engineer-to-order – project goods such as ships, or construction

Answer: Make-to-stock anticipates customer orders and makes inventory, engineer-to-order doesn’t complete design until the orders are received, make-to-order waits for the customer order to make pre designed products, and assemble-to-order is a hybrid between make to stock and make to order by stocking modules and subassemblies prior to receipt of the orders.

1. The point of postponement (POP) is a useful idea for developing manufacturing strategies. Explain why an organization needs to be aware of the decoupling point as it develops its supply chain strategy.

Answer: The POP enables the decoupling of production and inventory, so that the production doesn’t have to swing in concert with the order volumes day to day. It divides the supply from the demand to streamline the supply chain. It is determined by the longest wait time the customer will tolerate, and therefore is important in process design.

1. Explain the three types of layouts and give examples of products manufactured with these layouts:
   1. Process – laid out for low volumes, and custom products
   2. Product – laid out for a specific product – continuous flow, Bottling
   3. fixed-position – laid out for individual projects, or large items where the worker comes to the product
2. What are the advantages of cellular manufacturing layouts? What are their disadvantages?

Answer: Cellular layouts can improve flows, communication between workers, reduce parts and materials transport. They will not work so well in customized products, are more difficult to balance workload, requires a high degree of teamwork and cross training.

1. List three principles that should affect the design and operations of a warehouse.

Answer: The need for space, degree of picking automation, and material movement or flows, such as forklifts, conveyors, carts, etc.

1. Visit a local restaurant and analyze its layout. What do you see as some limitations or drawbacks with how the facility is laid out? What suggestions might you make for redesigning it?

Answer: Possible areas to examine are entrances, waiting areas, dining areas, bar areas, kitchen areas, the adequacy and the flows around and between areas.

## Critical Thinking Exercises

Visit or research online a manufacturing facility and a service organization in the area where you live.

1. In terms of the product-process matrix in Figure 9.1, to which category does the manufacturing facility belong and how would you classify the layout of the manufacturing facility?
2. In your opinion what are the drawbacks of process design and layout of the manufacturing facility? What suggestions do you have for improvement?
3. In which quadrant of the service process design matrix in Figure 9.3 would you classify the service organization you visited? What suggestions do you have, if any, for a redesign of this service process?

Answer: student examples will vary.