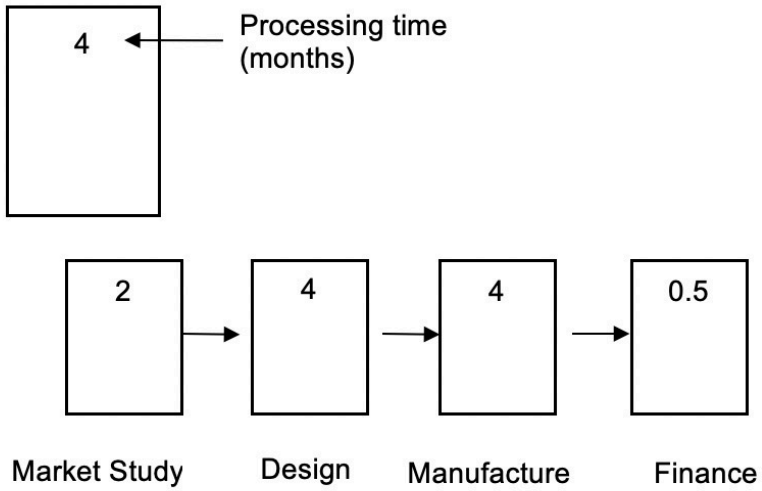
In Class Practice Problems



- Which resource(s) (corresponds to the process stage(s)) is the bottleneck? What is the maximum number of new products that this firm can develop per year with the process it is using? (what is the maximum capacity the firm can obtain?)

Bottleneck is the resource(s) with lowest capacity. Design and manufacturing departments are both bottleneck. Capacity rate is 0.25 projects/month = 3 projects/year.

- How long the development of a new product takes in this company? (What is the theoretical flow time?)

2+4+4+0.5=10.5 months

- Assuming this firm introduces new products at the rate of 2.4 projects per year, what is the utilization of each department in the company? (i.e., what percent of time are they busy?)

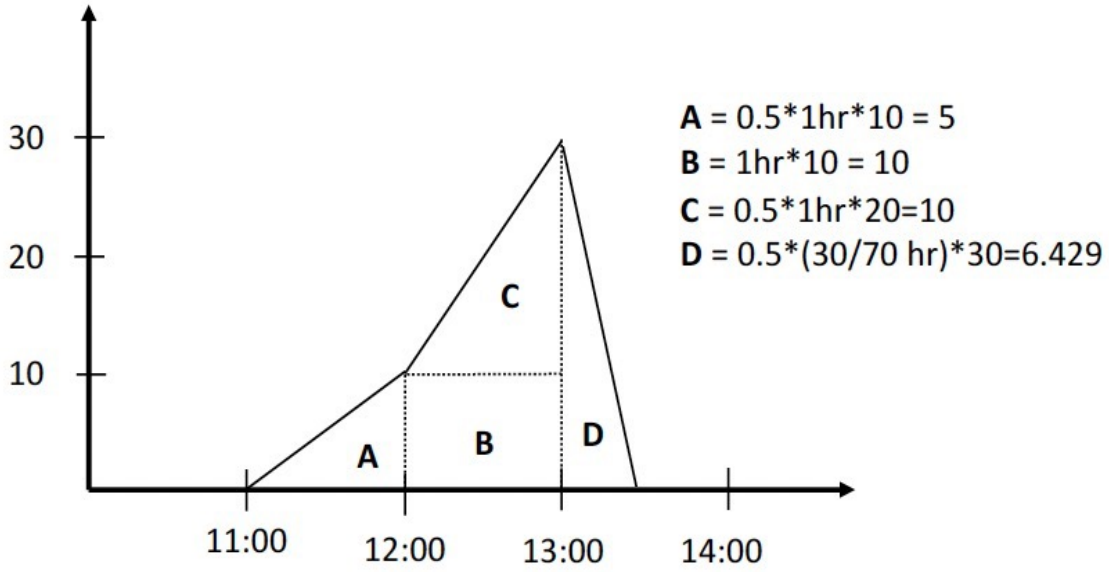
2.4 projects/year= 0.2 projects/month, Market Study: 0.2/0.5=0.4 i.e., 40%, Design: 0.2/0.25=0.8, i.e., 80%, Manufacturing 0.2/0.25=80%, Pricing 0.2/2=0.1 i.e., 10%

A Taco truck is serving customers during lunch time (11:00 am – 2 pm). People arrive at the truck from 11:00 am to 1:00 pm (see table below).

Time	Demand rate
11:00 – 12:00	60 customers/hour
12:00 – 1:00	90 customers/hour

The capacity of the Taco truck is 50 customers/hr during the off-peak hour of 11:00-12:00, then afterwards becomes 70 customers/hr until all the customers have been served. Inventory is assumed change continuously. What is the average number of customers waiting in line **during lunch time**?

The inventory buildup diagram of customers waiting in line is.



A = 0.5*1hr*10 = 5
B = 1hr*10 = 10
C = 0.5*1hr*20=10
D = 0.5*(30/70 hr)*30=6.429

Area/# of hours = (A+B+C+D)/3 = 10.48.

Here, inventory is assumed to change continuously.