Module 3 – Practice Questions

Dr Peters

Dr Peters is a physician employed by a large primary care practice in Wynnewood, PA. The practice in which he works is open 260 days a year. Physicians have 30-minute appointment slots starting at 8am all the way up to 6pm. The practice is looking for improvement opportunities and wants to get a sense of the Overall People Effectiveness (OPE) of their physicians. The data collected so far suggests that:

- Dr Peters, because of his German parents, spends 30 work days a year on vacation.
- He also loses 2h of potential work time each day due to electronic medical record-keeping (he blocks these 2 hours in his schedule, so no appointments are available during this time).
- Dr Peters has a really busy schedule, so 75% of his appointments are booked.
- About half of the patients Dr Peters sees are coming for their annual check-up. Such exam appointments are made a long time in advance.
- About one out of every six patients does not show up for his or her appointment.
- Though the appointment slots are 30 minutes per slot, Dr Peters only spends, on average, 23 minutes with the patient (or doing work related to the patient after the patient has left the office). Of those 23 minutes, about 5 minutes could easily be done by one of Dr Peters's assistants.

DRP1. How many patients does Dr Peters see on a typical day when he is at work?

DRP2. What is his OPE? (Assume that his maximum availability is 260 days in a year)

MySunshine Hotel

MySunshine Hotel is a chain with 10 identical hotels which operate 365 days a year. The chain invested $200M to purchase land for these 10 hotels and $100M to build and furnish them. Each hotel has 150 rooms and charges and average price of $180 per night. Each operating material cost for each hotel is $1M. On top of that, each hotel is staffed with 60 employees, each paid $50,000 a year on average. The number of hotel employees has a direct effect on hotel occupancy in the following way:

Hotel occupancy rate=0.01 X Number of Employees

Define the return on invested capital as the ratio of the profits (PER YEAR) and the invested capital. You can draw an ROIC tree in the same way that we drew a KPI tree in class. Simply have the ROIC as "the root" of the tree instead of profits. Then answer the following questions.

MH1. What is the ROIC?

MH2. Reducing the number of employees reduces staffing costs, but it also reduces the occupancy rate when service level drops. What is the ROIC if MySunshine reduces the number of employees to 50 per hotel?

Assign Tasks to Workers

Consider the following six tasks that must be assigned to four workers on a conveyor-paced assembly line (i.e., a machine-paced line flow). Each worker must perform at least one task.

Time to Complete Task (seconds)
Task 1 30
Task 2 25
Task 3 35
Task 4 40
Task 5 15
Task 6 30

The current conveyor-paced assembly line configuration assigns the workers in the following way:

- Worker 1: Task 1
- Worker 2: Task 2
- Worker 3: Tasks 3, 4
- Worker 4: Tasks 5, 6

ATW1. What is the capacity of the current line?

ATW2. Now assume that tasks are allocated to maximize capacity of the line, subject to the conditions that (1) a worker can only perform two adjacent operations and (2) all tasks need to be done in their numerical order. What is the capacity of this line now?

ATW3. Now assume that tasks are allocated to maximize capacity of the line and that tasks can be performed in any order. What is the maximum capacity that can be achieved?

ATW4. After focusing on capacity in the questions above, you now want to factor in demand for the last two questions. Demand is 50 units per hour. What is the takt time?

ATW5. What is the target manpower?