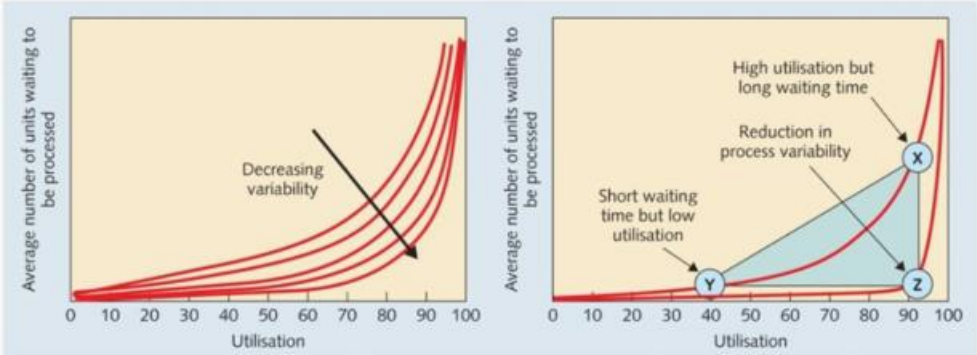
Esame 03.07.2020

Queue

1. In a store there are 5 people waiting in line for the payment. There are 2 cash counters and the service of each cashier is 2 people every 10 minutes. Each cashier has its own queue. What is the queue configuration?
    a. 2M/M/2
    b. 2M/M/1
    c. M/M/5
    d. M/M/2
2. Chose the one correct answer regarding the graph with X being the AS-IS situation



    a. To move from X to Y, we want to reduce the average number of units in line, we should reduce the utilization rate by reducing the number of resources
    b. Process variability results in simultaneous waiting and resources underutilization
    c. In order to move from X to Z, we should reduce system variability by introducing more resources
    d. All the answers are correct
3. In a bar, the barman is able to serve 2 people every 8 minutes. The arrival rate of clients has been estimated to be around 10 people every hour. Estimated the saturation of the barman.
    a. 0.5
    b. 0.2
    c. 1.5
    d. 0.67
4. In a grocery, there are 5 people waiting in line for the payment. There are 2 cash counters, and the service rate of each cashier is 2 people every 10 minutes. The clients are served by the 2 cashiers following a FIFO approach in one single line. What is the queue configuration?
    a. 2 M/M/2
    b. 2 M/M/1
    c. M/M/5
    d. M/M/2
5. Choose only one correct answer regarding the customer behaviour in a queuing system modelling
    a. Rejecting is when a customer already in the queue gives up the service and goes away without being served
    b. Balking is when a customer already in queue gives up the service and goes away without being served

c. Reneging is when a customer already in queue gives up the service and goes away without being served
d. Reneging is when a customer decides not to enter a queue because it is already too long

OS

1. With Pre-Shop-Pool and workload planning, the company :
    a. Reduces WIP and Shop-Floor time
    b. Controls the production and reduces necessity operators
    c. Reduces setups
    d. Immediately releases production orders to shorten lead-time
2. What are the PROs for the leading strategy?
    a. Lower impact of unforeseen events and underestimating demand, spare parts capacity, better deliver reliability
    b. Lower production costs, lower impact from overestimating demand, high plant utilization
    c. Lower impact of unforeseen events, high plant utilization, spare parts capacity, better delivery reliability
    d. Outbound cash flow, higher impact of overestimating demand, higher production costs
3. In the service industry, the level of satisfaction of a customer has been defined
    a. By the experience
    b. As the difference between the expectation and the service price
    c. As the difference between perception and expectation
    d. By the experience of the outcome
4. What are the service product characteristics?
    a. Simultaneity, customer participation, homogeneity, perishability
    b. Perishability, intangibility, time consuming, homogeneity, customer participation
    c. Intangibility, simultaneity, heterogeneity, customer involvement in the service process, perishability
    d. Simultaneity, heterogeneity, invisibility, customer involvement in the service process, perishability
5. How would you compute the variability?
    a. The difference between the average value and the actual value
    b. The difference between the average value and the forecasted value
    c. The difference between the average value and the forecasted value (sì, era doppia)
    d. The difference between the actual value and the forecasted value
6. Investing in cross-trained employees supports company to
    a. Reduce demand variability
    b. Make capacity more flexible
    c. Increase time-buffer for customers
    d. Increase overall capacity
7. Which characteristic belongs to a professional service shop compared to professional service?
    a. More attention to quality
    b. Request of knowledge sharing
    c. Less attention to cost
    d. More product innovation
8. You are a manager of a restaurant; if your service process (output) is affected by variability, which lever do you invest in?

a. Reservation system
b. Promotion
c. Standardization of activities
d. Increase customer participation in the process

9. Which characteristic belongs to a performance that is classified as Order Qualifier?
    a. Company's quality performance is very good
    b. If company's performance improves, the company gains more orders
    c. If company's performance gets worse, the company loses orders
    d. The performance defines the competitive advantage of the company

Lean

1. The assembly stage of Ryccar Spa company process 5 variants of bikes and works 1350 min/day. Average demand is equal to 50 bikes/day. Assembly sage is fully dedicated, and its availability is 75%. Cycle time to assemble bikes is 18 min/bike. Assembly stage requires a setup every time the variant changes. Changeover time is equal to 35min/setup. Which of the following EPE for the assembly stage is the correct one?
    a. 1.16 days
    b. 0.38 days
    c. 1.45 days
    d. 0.79 days
2. Which is the most probable decision you can find if a company decides to drive digital transformation through lean principles?
    a. Automations in order to exploit new technologies for increasing capacity
    b. HMI technologies in order to increase flexibility of operators
    c. RFiD technologies in order to track real time product status
3. Consider a manufacturing company producing machine tools and define which activity is value adding:
    a. Test a product before sending it to the customer
    b. Inserting a ball shift on its shaft
    c. Bring electric motors from the warehouse to the place where machine tool is assembled
    d. Plan internal and external operators' activities for the next week
4. During SMED
    a. Setup activities are automatized
    b. Internal activities are moved to the begin or to the end of setup procedure
    c. External activities are moved to the begin or to the end of setup procedure
    d. Products are batched in order to reduce setups
5. Shotter Spa produces pencils and works with 2 shifts (Ta=900 min/day). The average demand is 300 pencil/day. There are 2 production stages, both fully dedicated and with availability of 100%: P1 (CT=30 sec/pencil; CO=5 min/setup) and P2 (CT= 25sec/pencil; CO=0 min/setup). Which is the Minimum Batch Size of the company?
    a. MBS= 2 pencil/batch
    b. MBS= 150 pencil/batch
    c. MBS= unitary batch
    d. MBS= 230 pencil/batch
6. Considering an R&D department led by Lean Innovation concepts, which is the most probable context you can find?
    a. Function Pushing for perfect learning cycle, launching product on the market only when all the features are completed
    b. Function Pushing for fast learning cycle through many small iterative projects
    c. Function Pushing for fast learning cycle with very big teams in order to have more resources on the same projects
    d. Teams working at the same time on more projects in parallel
7. Which is the longest time in an operations system?
    a. Throughput time

b. Value adding time
c. Cycle time
d. Not-value adding time

8. Bendys Spa is a MTO company. Production process is made by 4 stages with the following EPE values: EPE(S1)=3.15 days; EPE(S2)=0.16 days; EPE(S3)=0; EPE(S4)=1.14 days. Which is the time period necessary to Bendys Spa to produce the whole mix and satisfy required by the customers?
    a. 3.15 days
    b. 1.14 days
    c. It depends on the amount of stocks and raw materials
    d. 1.1125 days
9. The impact of Heijunka box is of
    a. Creating continuous flows
    b. Reducing bullwhip effect
    c. Increase safety stocks
    d. Reducing setups
10. DECAF conditions analysis supports managers in
    a. Increase availability of a cell
    b. Defining optimal level of stocks
    c. Improving planning of production
    d. Understanding gap for creating continuous flow

Yield

1. Chose the only correct answer
    a. Cost of underestimation includes the lost revenue associated with reserving too few seats as discounted fare (underestimated demand)
    b. Cost of underestimation includes the cost of reserving too many seats at full fare (overestimated demand). As if the empty full-fare seat could have been sold at the discounted price
    c. Cost of underestimation includes the lost revenue associated with reserving too few seats as full fare (underestimated demand)
2. How would you define the Heuristic EMSR method?
    a. An iterative method used to set the right overbooking when there is no-show phenomenon
    b. An iterative method used to maximise the profit by appropriately allocating the available capacity whenever there are more than 2 classes of customers
    c. An iterative method used to maximise the profit by appropriately allocating the available capacity whenever there are less than 3 classes of customers
    d. An iterative method used to set the right overbooking strategy by appropriately allocating the available capacity whenever there are more than 2 classes of customers
3. Which of these sets of characteristics represent the ideals for yield management?
    a. Variable capacity, perishable inventory, low capacity-change costs, and product booked in advance
    b. Fixed capacity, perishable inventories, low capacity-change cost, and ability to segment markets
    c. Perishable inventory, high capacity-change costs, product sold after its use and fixed demand
    d. Fixed capacity, perishable inventory, high capacity-change costs, ability to segment market, fluctuating demand and products booked or sold in advance
4. Choose only one correct option

    a. In order to maximise my revenues, it is more convenient to sell all tickets to low-cost passengers as I am sure they will buy them all
    b. Having fixed capacity of event's seats, we should start selling full price tickets to ensure profit maximisation and cover all the seats available
    c. Protection level of full price customers is necessary to avoid cannibalization from discounted price tickets
    d. Protection level of discounted price tickets is necessary to avoid cannibalization from full price tickets
5. Which of the following system characteristics make YM not useful?

a. Possibility to buy/book in advance the product/service
b. Products are perishable
c. System's variable capacity
d. There are different types of customers (segments)

Cases

1. In the **HQ case**, which lever should you implement in order to improve flexibility performance?
    a. Split production capacity in higher number of machines
    b. Increase capacity saturation
    c. Launch production of big batches in order to reduce setups
    d. Increase automation grade in order to produce faster
2. **Shouldice Hospital** plays mainly on 2 levers to provide customers with such a high well-recognized value. Which are them?
    a. High specialization (only one surgery) and high competences of its own employees
    b. High specialization and low price
    c. High competences of its own employees that enable Shouldice to deliver above-average quality
    d. Low price and competences of its own employees
3. In the **HQ case**, which are the most significant performances to compete in the new market?
    a. Time (speed), flexibility (product and plan) and quality of design
    b. Time (speed), price and flexibility (variety)
    c. Quality (conformity) and time (delivery reliability)
    d. Price and quality of design
4. **Shouldice Case** represents a "best practice" of alignment between market and operations. How is its concept built?
    a. The concept of Shouldice hospital is based on both outcome and experience provided to the patients
    b. Shouldice hospital built its concept on the outcome, namely the high success rate in the hernia surgery
    c. Shouldice hospital built its concept on the short and predictable time required to patients to recover from hernia surgery
    d. The concept of Shouldice hospital is based on the low price for hernia surgery compared to competitors
5. In the **HQ case**, which of the following is not a consistent "structural choice" according to the new market?
    a. Small number of big production machines in order to ensure machine saturation
    b. Increasing the production capacity in order to absorb demand variability
    c. Mono-impression moulding in order to ensure lower setup times
    d. Low automation grade