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Business Process Management

Practice 7 – Quantitative Process Analysis II

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Chapter 7, exercises 7.15-7.16

We consider a Level-2 IT service desk with two staff members. Each staff member can handle one service request in 4 working hours on average. Service times are exponentially distributed. Requests arrive at a mean rate of one request every 3 hours according to a Poisson process. What is the average time between the moment a service request arrives at this desk and the moment it is fulfilled?

...Now consider the scenario where the number of requests becomes one per hour. How many level-2 staff are required to be able to start serving a request on average within two working hours of it being received?

Chapter 7, exercise 7.9

An insurance company receives 220 calls per day from customers who want to lodge an insurance claim. The call center is open from 8am to 5pm. The arrival of calls follows a Poisson process. Looking at the intensity of arrival of calls, we can distinguish three periods during the day: the period 8am to 11am, the period 11am to 2pm and the period 2pm to 5pm. During the first period, around 60 calls are received. During the 11am–2pm period, 120 calls are received, and during the 2pm–5pm period, 40 calls are received. A customer survey has shown that customers tend to call between 11am and 2pm because during this time they have a break at work and they take advantage of their break to make their personal calls. Statistical analysis shows that the durations of calls follow an exponential distribution.

According to the company's customer service charter, customers should wait no more than one minute on average for their call to be answered.

- Assume that the call center can handle 70 calls per hour using seven call center agents. Is this enough to meet the 1-minute constraint set in the customer service charter? Please explain your answer by showing how you calculate the average length of the queue and the average waiting time.
- What happens if the call center's capacity is increased so that it can handle 80 calls per hour (using eight call center agents)?
- The call center manager has been given a mandate to cut costs by at least 20%. Give at least two ideas to achieve this cut without reducing the salaries of the call center agents and while keeping an average waiting time below or close to one minute.

Simulation of an Insurance Claims Handling Process

Chapter 7, exercise 7.10

An insurance company is facing the following problem: Whenever there is a storm, their claim-to-resolution process is unable to cope with the ensuing spike in demand. During normal times, the insurance company receives about 9,000 calls per week, but during a storm the number of calls per week doubles.

The claim-to-resolution process starts when a call related to lodging a claim is received. The call is routed to one of two call centers depending on the location of the caller. Each call center receives approximately the same amount of calls (50–50) and has the same number of operators (40 per call center). The process for handling calls is identical across both call centers.

The tasks of the claims handling department are performed by *claims handlers*. There are 150 claims handlers in total.

The hourly cost of a call center agent is 30, while the hourly cost of a claims handler is 50.

The call center agents and claims handler work during regular business hours (40 hours/week).

Claims Handling Process Model & Processing Times

