

## Service Operations Management (SOM)

# Managing Waiting Lines

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## Need to understand waiting lines

- Customers waiting are like WIP inventory
- Waiting times can have a halo effect on how customers view the rest of the service encounter
- Staffing decisions needs to consider the impact of waiting
- Every second waiting in the queue is a non-value added activity

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## Agree?

- If service rate is higher than arrival rate then there would not be any queue
- With one server if  $X$  is the average number of people in the queue, with two servers, the average number of people in the queue would be  $X/2$

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## Essential features of queuing systems

- Arrival process: rate and population  $\lambda$
- Service process: rate and capacity  $\mu$
- Queue configuration  $\leq$
- Queue discipline

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## Typical capacity decisions

- How many additional beds should a hospital add to limit patient backlog below 50?
- What should be the size of a call centre such that no calling customer waits more than 30 seconds?
- What is the probability that when a customer walks into a bank she finds at least one teller free?
- How will an additional runway at Mumbai airport reduce aircraft waiting time?

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## The psychology of waiting

- Waiting is an integral part of our lives
  - But causes so much grief!
- Perception is more important than reality
- Unoccupied time feels longer than occupied time
  - Distract and entertain

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## The psychology of waiting

- Pre-process waits feel longer than in-process waits
  - Communicate as soon as possible and get customers in process
  - Wait in the bar!
- Uncertain or unexplained waits feel longer than known waits
  - Communicate frequently
  - Impact of anchoring and prospect theory
- Solo Waits feel longer than group waits

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