

Important Performance Measures for Processes

- The service level for each simulation is the fraction of demand that is satisfied.

Service level for entrance = Objects entering process / (Objects entering process + Objects unable to enter)

For our example, in simulation #1:

Service level = $54 / (54 + 7) = .89$

- The overall mean service level of the process is the mean of the service levels calculated for each simulation; in this example it equals .88.

Important Performance Measures for Processes

- The mean cycle time at a buffer is the mean amount of time an object takes to move through the buffer during a simulation.

For our example, in simulation #1:

Mean cycle time at Line = 10.64

- The overall mean cycle time at a buffer is the mean of the mean cycle times of the buffer for each simulation.

In this example, the overall mean cycle time at Line = 10.59.

Option 1: Improving the system

We would like to analyze how would the performance of the bank be improved by the addition of a check-reading machine.

Suppose the addition of a check-reading machine would reduce *service time per customer* from Nor(2.4,.5) to Nor(2,.5).

How to change the original process simulation model?

Change working time for Teller to Nor(2,0.5)

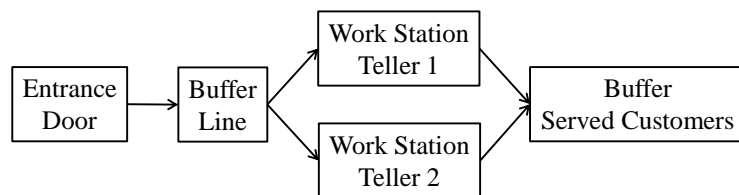
Option 1: Process Improvement Results

- Before the change,
 - Overall mean service level = 0.88.
 - Overall mean waiting time (i.e., overall mean cycle time at Line) = 10.59.
- After adding a check-reading machine,
 - Overall mean service level = 0.98.
 - Overall mean waiting time = 5.48.

Option 2: Improving the system

How would the performance of the bank be improved by the addition of a second teller?

Process flow map for adding a second teller:



Option 2: Process Improvement Results

- Before the change,
 - Overall mean service level = 0.88.
 - Overall mean waiting time (i.e., overall mean cycle time at Line) = 10.59.
- After adding a second teller,
 - Overall mean service level = 1.00.
 - Overall mean waiting time = 0.69.