HW5: Performance analysis I

Consider the process in figure 4.46.



(a) Determine the following performance indicators:

• Occupation rate (utilization) for each resource,

Task1：20/60/2=67%

Task2：20/60/2.5=83%

• Average WIP (work in progress),

Task1 WIP:0.67/(1-0.67)=2

Task2 WIP:0.83/(1-0.83)=5

Total WIP = 7

• Average flow time (throughput time), and

Task1：2/30\*60+2=6min

Task2：5/24\*60+2.5=15min

Total：6+15=21min

• Average waiting time for each task.

Task1：0.67/(30-20)\*60=4min

Task2：0.83/(30-20)\*60=12.5min

Task 2 is a check task. The management thinks about a selective execution

of this task where only 25% of the cases are checked. The average

service time of this new task is 6 minutes.

(b) Determine the performance indicators again:

• Occupation rate (utilization) for each resource,

Task 1：20/60/2=67%

Task2：20\*0.25/60/6=50%

• Average WIP (work in progress),

Task1 WIP: 0.67/(1-0.67)=2

Task2 WIP: 0.5/(1-0.5)=1

Total WIP =3

• Average flow time (throughput time), and

Task1：60/(30-20)=6min

Task2：60/(10-5)=12min

Total：6+12\*0.25=9min

• Average waiting time for each task.

Task1：0.67/(30-20)\*60=4min

Task2：0.5/(10-5)\*60=6min