

## Chapter 4

→ Rush time analysis (The entire processing time has to be considered)

→ Idle time calculation

→ Depends on the bottleneck resource.

→ The labour cost is dependent on the entire process.

Schlumberger is a demand constraint industry

→ we had a lot of idle time and rush times.

Processing time	$w_1$ 13 min/unit	$w_2$ 11 unit	$w_3$ 8 unit
Capacity	$(1/13)$ unit/min	$\frac{1}{11}$ unit/min	$\frac{1}{8}$
Process cap	$\min(C_{w_1}, C_{w_2}, C_{w_3}) = 4.61 \text{ units/hr}$		

Flow rate Demand = 125 units/week = 3.57 unit/hr

→  $\min(\text{Proc Cap}, \text{Demand}, \text{Supply}) = 3.57 \text{ unit/hr}$

Cycle time  $\rightarrow 1/3.57 = 16.8 \text{ min/unit}$

Idle time  $16.8 - 13 \quad | \quad 16.8 - 11 \quad | \quad 16.8 - 8$

Utilization

→  $\frac{\text{Demand}}{\text{Capacity}} = \frac{3.57}{60 \times 1/13}$ ,  $\frac{3.57}{60/11}$ ,  $\frac{3.57}{60/8}$

⇒ Reallocation → New labour to bottleneck or away from

→ Work off the bottleneck

→ For ↑ utilization

→ For meeting demand in (capacity constrained) [Demand flow rate > Process flow rate]



Cost of direct labour =  $\frac{\text{Total wages (Ex: network)}}{\text{Units produced (Ex: Network)}}$



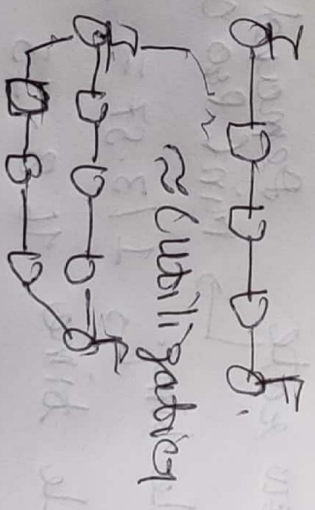
companies require this to be process capacity constrained (∞ demand + ∞ supply)

Utilization of all resources → 100%  
↳ No bottlenecks

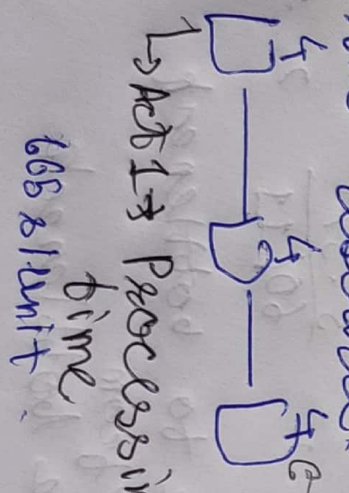
⇒ Load balancing → s.t. sequence of generation.

⇒ Increase process capacity

↳ 1. Replicate current process flow  
 ↳ Process to make use of experienced workers  
 ↳ Increase utilization  
 ↳ Increase production  
 ↳ Newer improves



2. Add more workers to the resource.



→ Requested capacity  
 ↳ 700 units/week

$\frac{\text{# workers} \times \left( \frac{1}{\text{Processing time}} \right)}{\text{Request capacity}}$

↳ go your work in whatever sequence (within task/Act i) u wish to

5. Divide tasks amongst labours -  
more

⇒ Chapter 7 deals with BATCH SIZE

order size ↓  
impact on utilization