

# **UGBA 141**

## **Discussion 3**

**Agenda: Process module wrap-up**

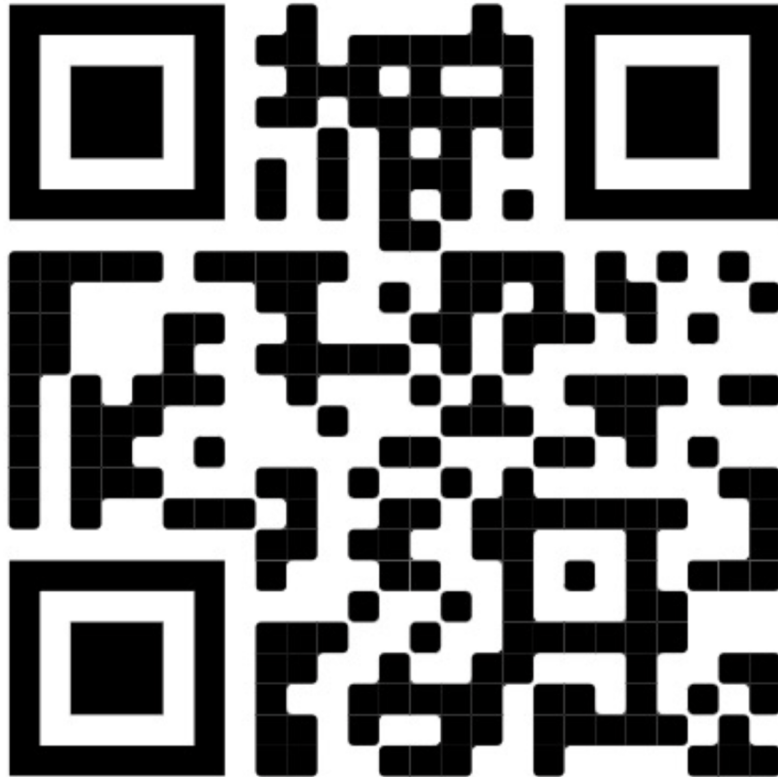
- Rework and flow-dependent processing**
- Inventory buildup tool**

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# Vibe Check Survey

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- Waiting for your feedback!



# Rework

- Certain percentages of flow units need **more than one** passes of a process
- TSA screening example from lecture



some ppl needs to go through twice.

- Capacity computation with rework

assume 80% ppl 1 pass, 20% ppl 2 pass

Approach 1

averaged process time

$$= 80\% \times \frac{1}{3} + 20\% \times \frac{2}{3} = \frac{2}{5} \text{ min}$$

$$\text{Capacity} = \frac{1}{\text{process time}} = 2.5 \text{ ppl/min}$$

Approach 2

$$80\% \times \frac{1}{3} = \frac{4}{15}, \quad 20\% \times \frac{2}{3} = \frac{2}{15}$$

$\frac{\frac{4}{15}}{\frac{4}{15} + \frac{2}{15}}$  of time processing 1-pass

$\frac{\frac{2}{15}}{\frac{4}{15} + \frac{2}{15}}$  of time processing 2-pass

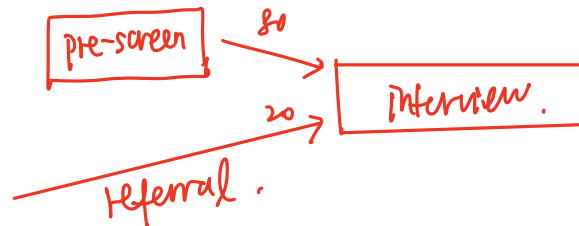
$$\frac{4}{6} \times 3 + \frac{2}{6} \times \frac{3}{2} = 2.5 \text{ ppl/min}$$

# Unit-dependent Processing

- Not all units are the same...

consequence: processing time can be different for different units.

- Key idea: **redefine** flow unit as **minute/hour of work**



- Utilization computation

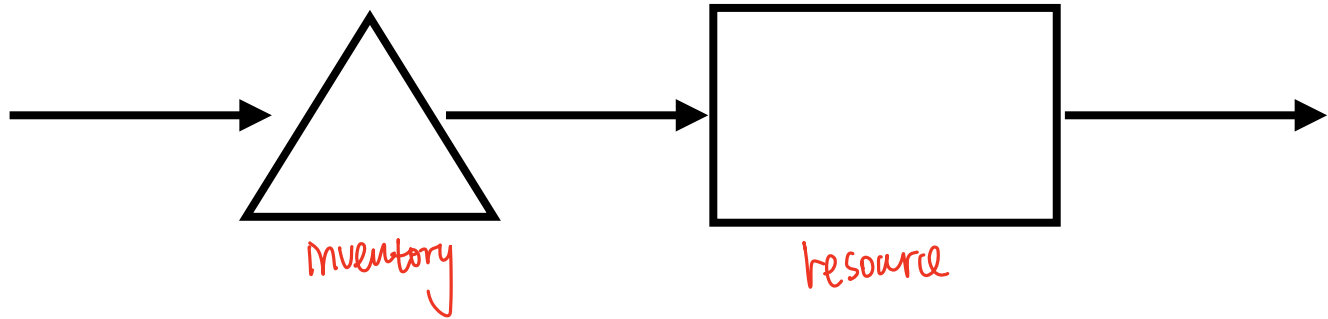
say. 80 ppl / day pass pre-screen  
20 ppl / day via referral  
50 interviewer 2hr / day

ppl - prescreen  $\rightarrow$  1 hr interview  
ppl by referral  $\rightarrow \frac{3}{4}$  hr interview.

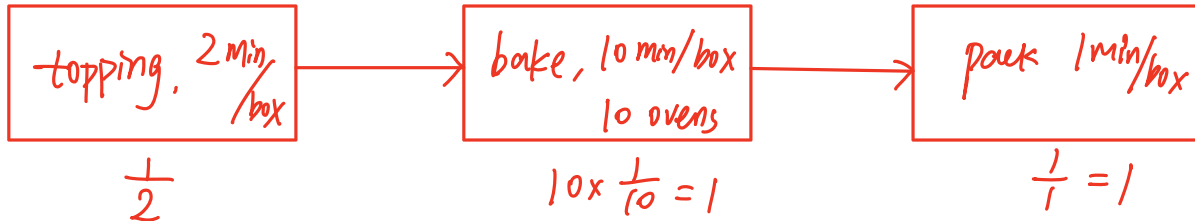
$$\Rightarrow \text{implied utilization} = \frac{80 \times 1 + 20 \times \frac{3}{4}}{50 \times 2} = 95\%$$

# Inventory Buildup Tool

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- Example of Cheeseboard Pizza



$\Rightarrow$  capacity of process =  $\min \left\{ \frac{1}{2}, 1, 1 \right\} = \frac{1}{2} \text{ box / min}$

$$\text{Time to make } x \text{ boxes} = (2 + 10 + 1) \text{ min} + \frac{x - 1}{\frac{1}{2}} \text{ min}$$

starting with 0 pizzas

Inventory of pizzas.

