

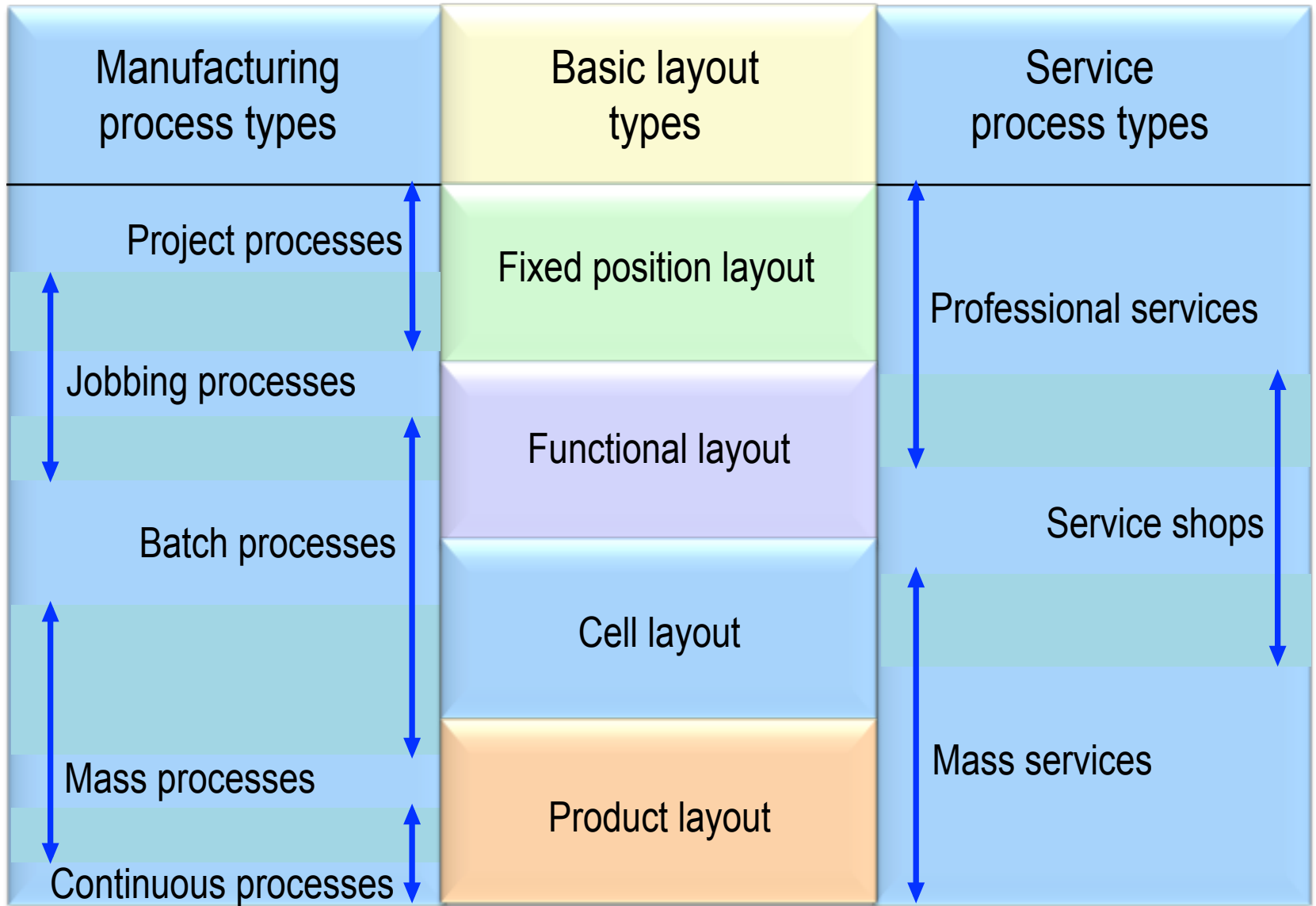
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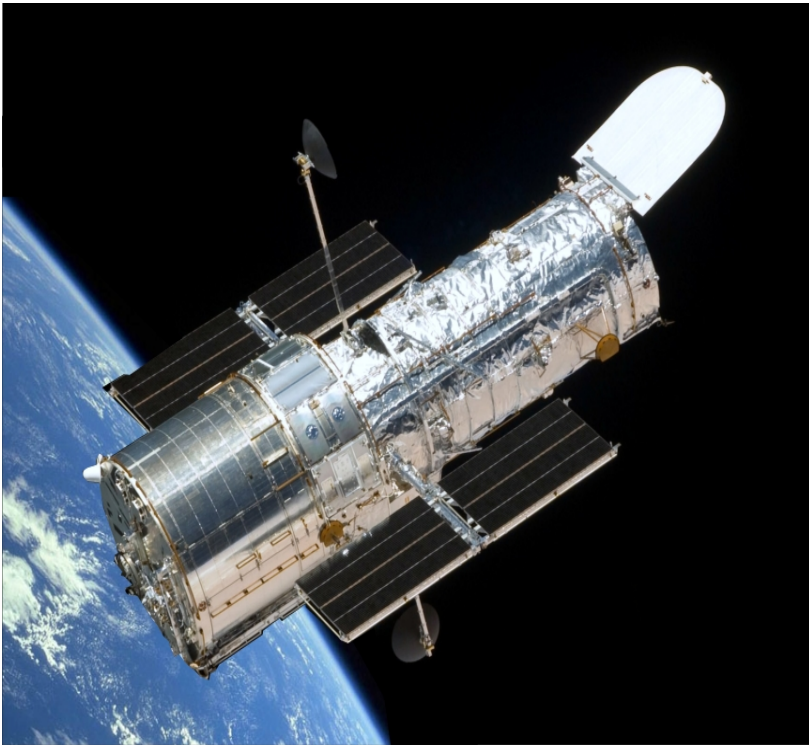
**For the
Open
Minded**

Designing Operations: Part 3

Dr. Mehmet Chakkol



Process Type? And Layout Type?



Production of Hubble Telescope



Construction engineering services

Process Type? And Layout Type?



Process Type? And Layout Type?



Rolls Royce Jet Engine Production



Tesco Mega Store

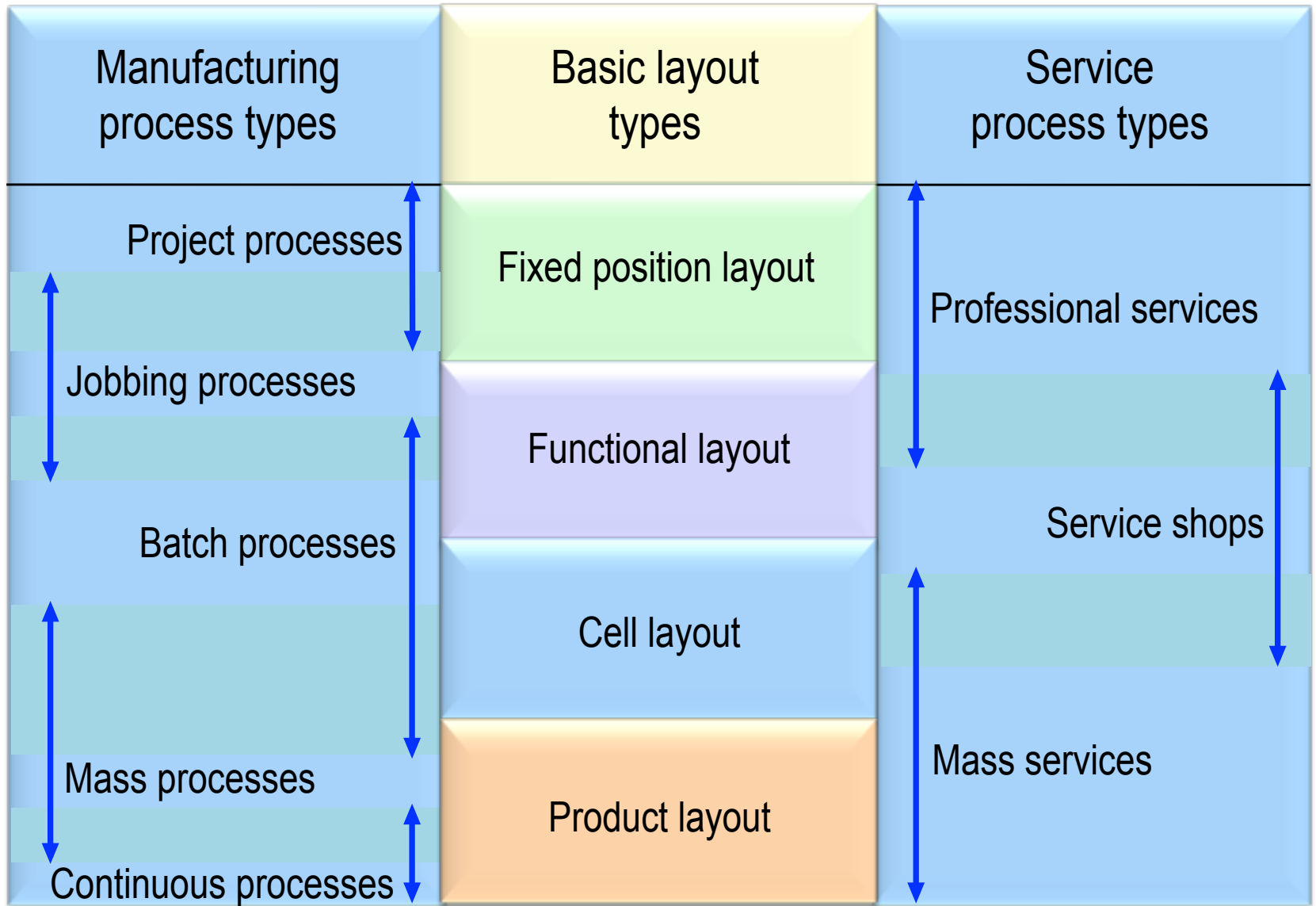
Process Type? And Layout Type?



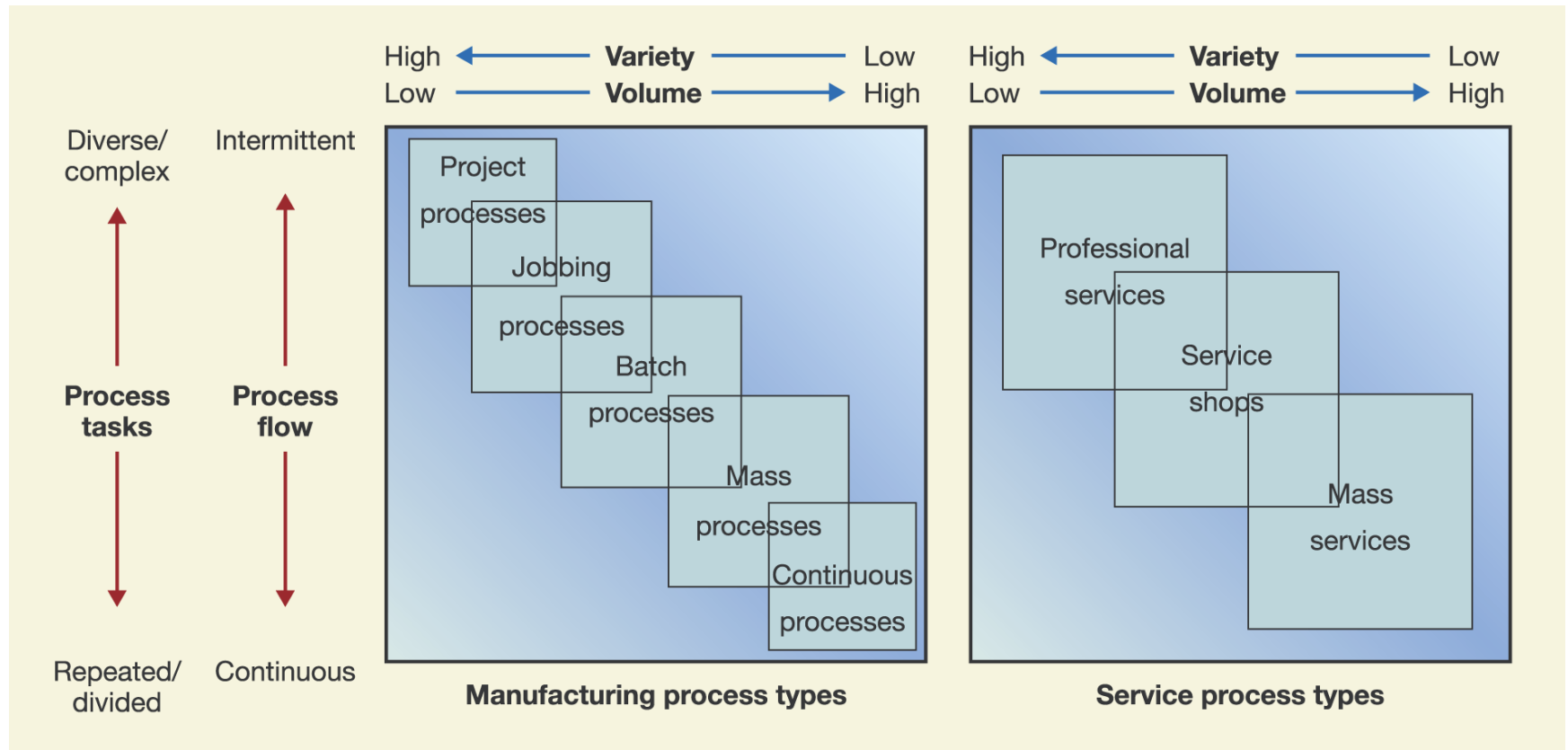
Petrochemical Refinery



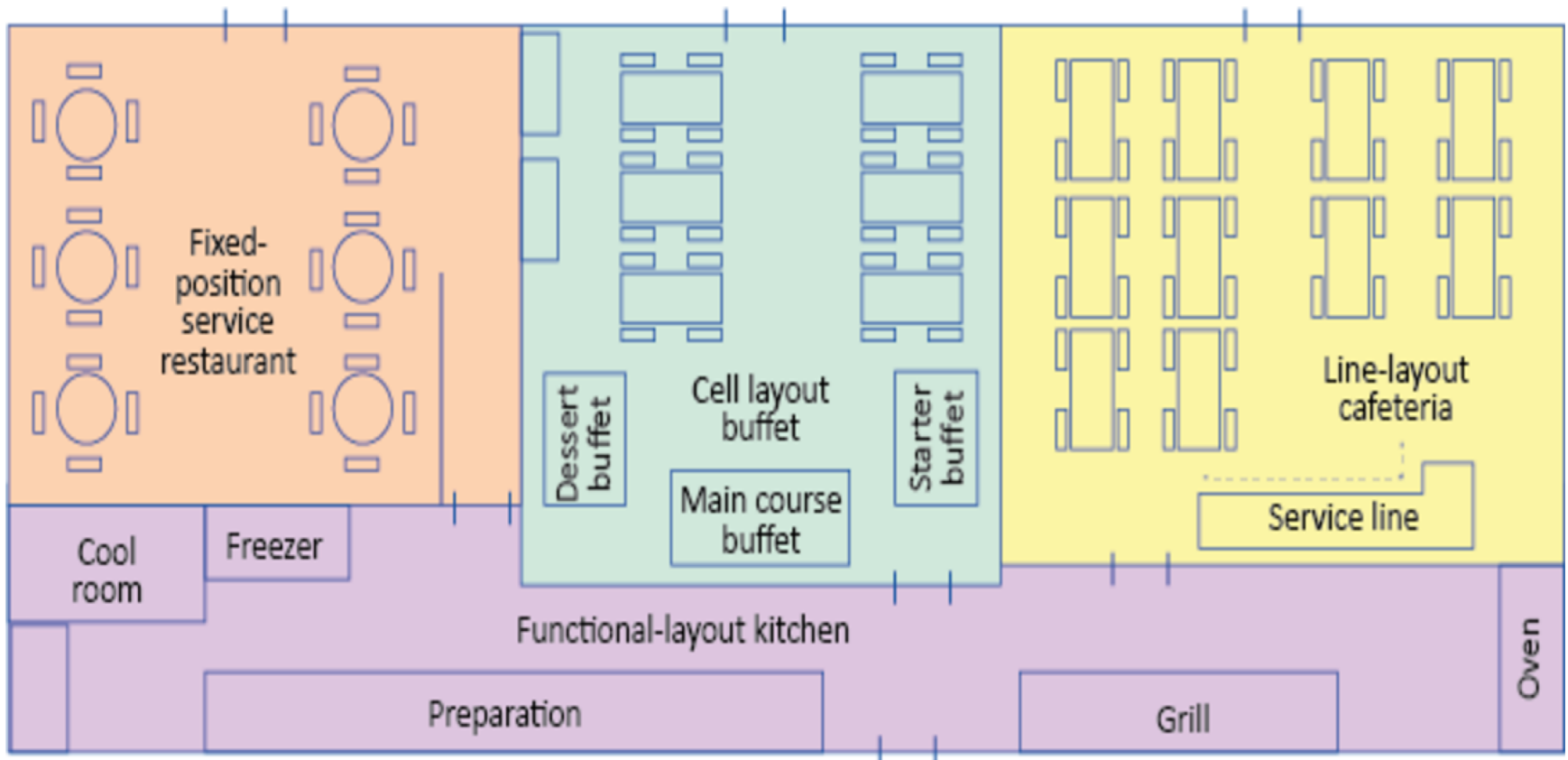
Utility Services



What is the type of **process** and **layout** used in lettuce harvesting operation?



Different Layouts can exist



Layouts in restaurants



Balancing the Workload in Operations

Once the layout is determined how do you assign the tasks to the transforming resources : Line Balancing

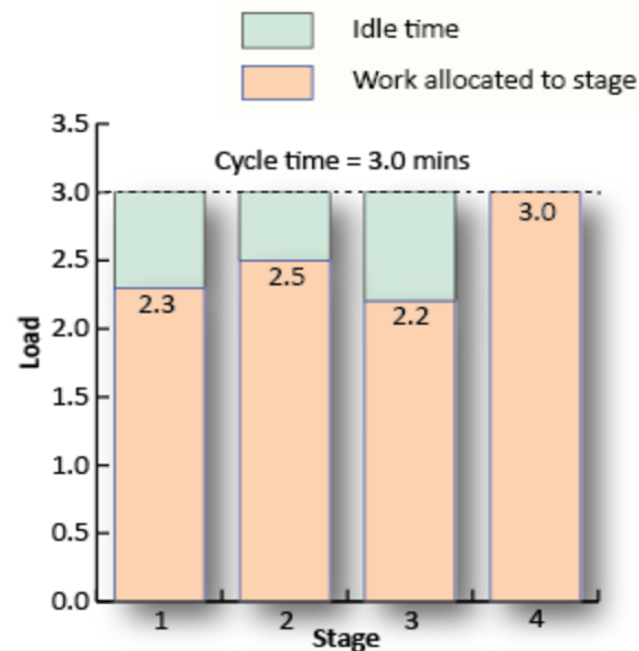


Figure 6.3.1: Different cycle times in a balanced process

So let's calculate the balancing loss for this process:

Idle time every cycle = $(3.0 - 2.3) + (3.0 - 2.5) + (3.0 - 2.2) = 2.0$ mins

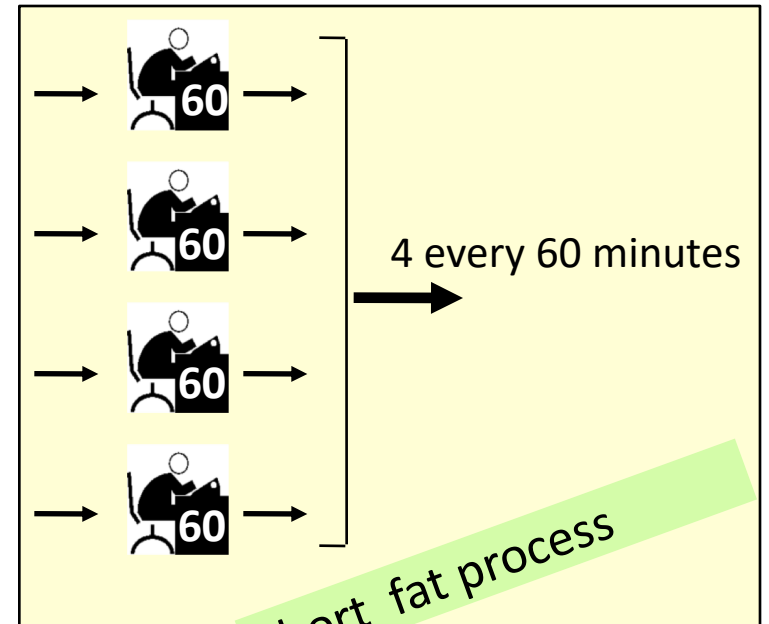
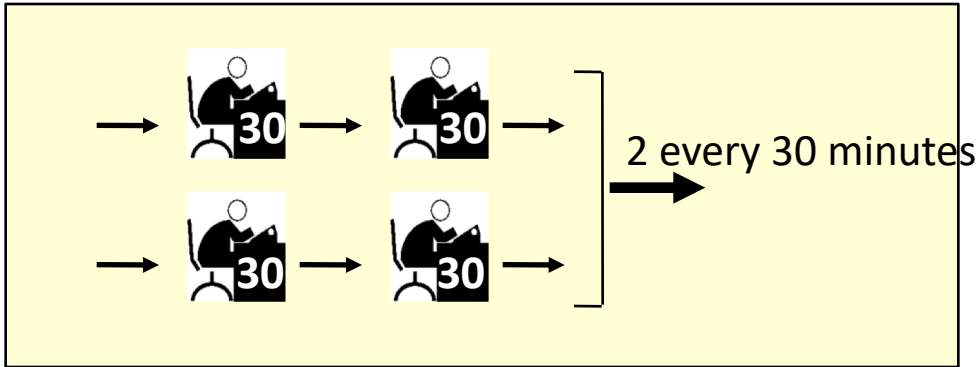
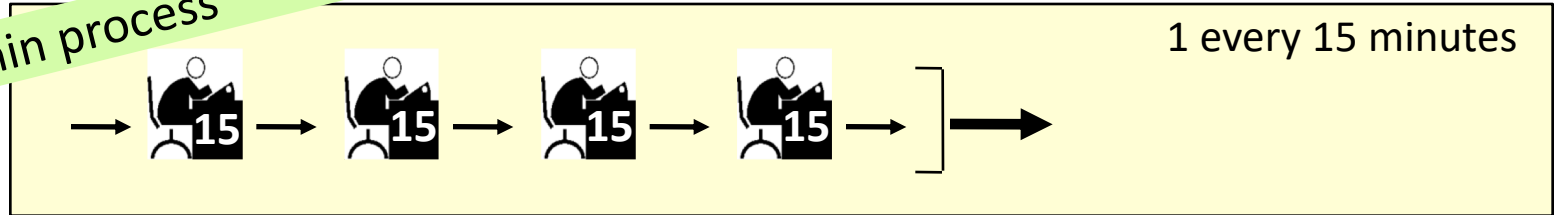
Balancing loss = $2.0 / (4 \times 3.0)$

= 0.1667

= *This means that 16.67% of the employee and working time is lost.*

A 60min task with a required cycle time of 15min

Long thin process



Talking point 1: Let's discuss the overall adv/disadv

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	Advantages		Disadvantages
Long & thin	controlled flow simple materials handling lower capital requirement duplication) greater efficiency higher space utilisation	(no	Exposed to breakdowns Non-flexible Too much standardization can cause high turnover
Short & fat	higher mix flexibility higher volume flexibility greater robustness less monotonous higher ownership		Training times Equipment needs Duplication of resources Reliant on employees

Talking Point 2: Balancing the workload

The layout and design of any operation is detrimental to its effectiveness. Please watch the BBC News video (0:56 mins), which shows how congestion within London underground stations have been reduced.

Can you make an operation faster by slowing down a process? Does it really work? What are the implications?

<https://www.bbc.co.uk/news/av/uk-35776122/holborn-tube-station-extends-standing-only-trial>

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Boarding example:

<https://www.bbc.co.uk/news/business-50214631>

Concluding Points

- ⦿ Layout is detrimental for operational performance
- ⦿ Four basic layouts are linked to the different process types through volume and variety
- ⦿ But same process types can also have different layouts
- ⦿ Trade-offs exist for each layout type
- ⦿ We also need to consider how to assign tasks to transforming resources: long & thin vs short & fat

Agenda for Seminars: North West Constructive Bank

- ◎ Process Design
- ◎ Layout
- ◎ Flow



Source: Slack et al (2013). Please see the post on myWBS detailing the case.