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WARWICK BUSINESS SCHOOL
THE UNIVERSITY OF WARWICK

**For the
Open
Minded**

Designing Operations: Part 2

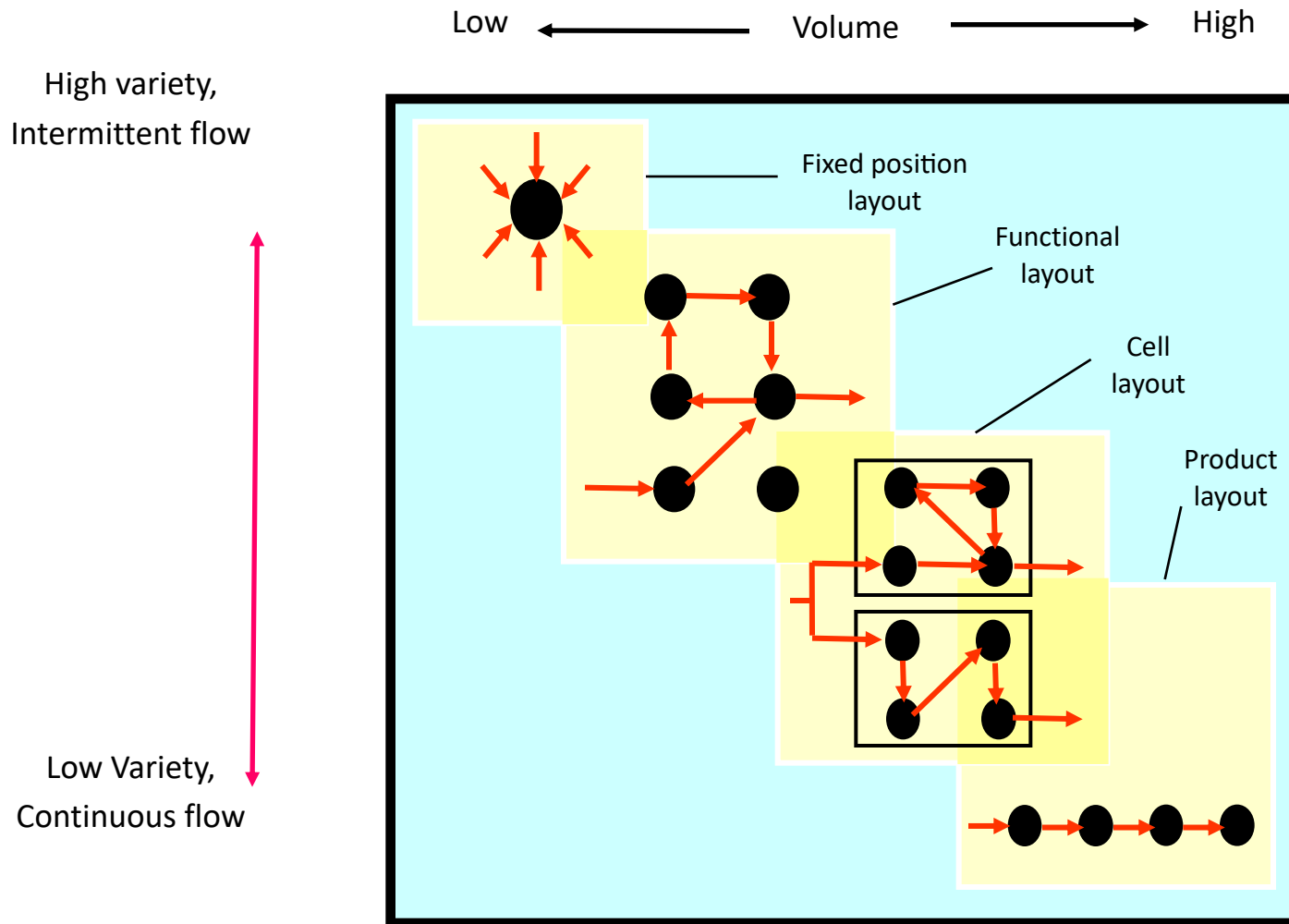
Dr. Mehmet Chakkol

How do we determine how to position the transforming resources in relation to each other?

Layout is important (!)



Layout Types



1- Fixed Position Layout Type

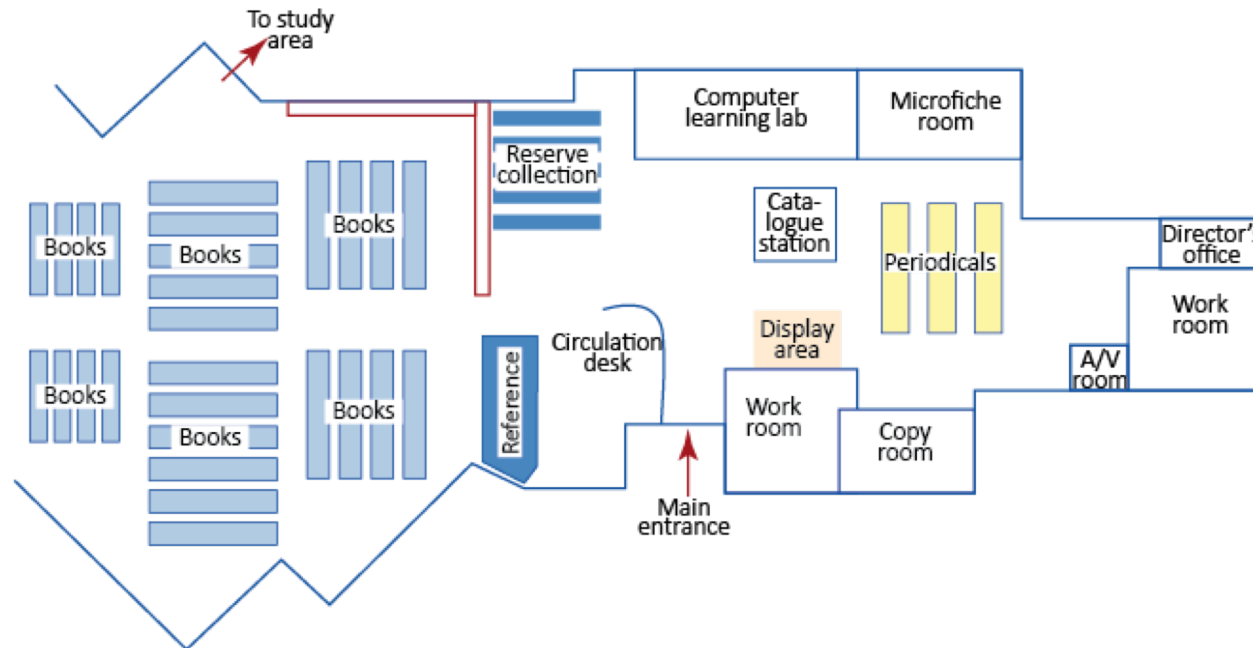


This layout is used when the transformed resource is too large or too delicate to move or simply it is not feasible to move the resource.

Generally, this layout is used for low volume and high variety products and services. A prime example for this layout is a construction site or building of a large aircraft. In this layout, the end product/service is stationary.

The associated equipment, parts, service employees and engineers come to the resources during the operations. Demolitions sites, events or operating theatres are examples of fixed position layout design.

2- Functional Layout Type



A Library Layout

Within this design, similar transforming resources or processes are located together - usually according to their functions to meet the demand of the transforming resources. In a functional layout, the flow of products or customers can take different routes through different functional areas. Hospitals, libraries and supermarkets can all be examples of functional layout where similar resources are grouped together according to their characteristics/functions.

3- Cell Layout Type



A Department Store

This layout involves locating in close proximity (a cell of) transforming resources with a common purpose, such as processing the same types of product or serving similar types of customer. In a cell layout the transformed resources entering the process are pre-selected to move to one part of the operation. A good example is a maternity unit in a hospital where all maternity related care is provided within a cell within the hospital. Although there might be some variation in the way each patient uses the unit such as different birth methods, patients entering this process are all pre-selected, i.e., they are all pregnant. Another example is computer component manufacturing or a department store that provides various products

4- Product (Line) Layout Type

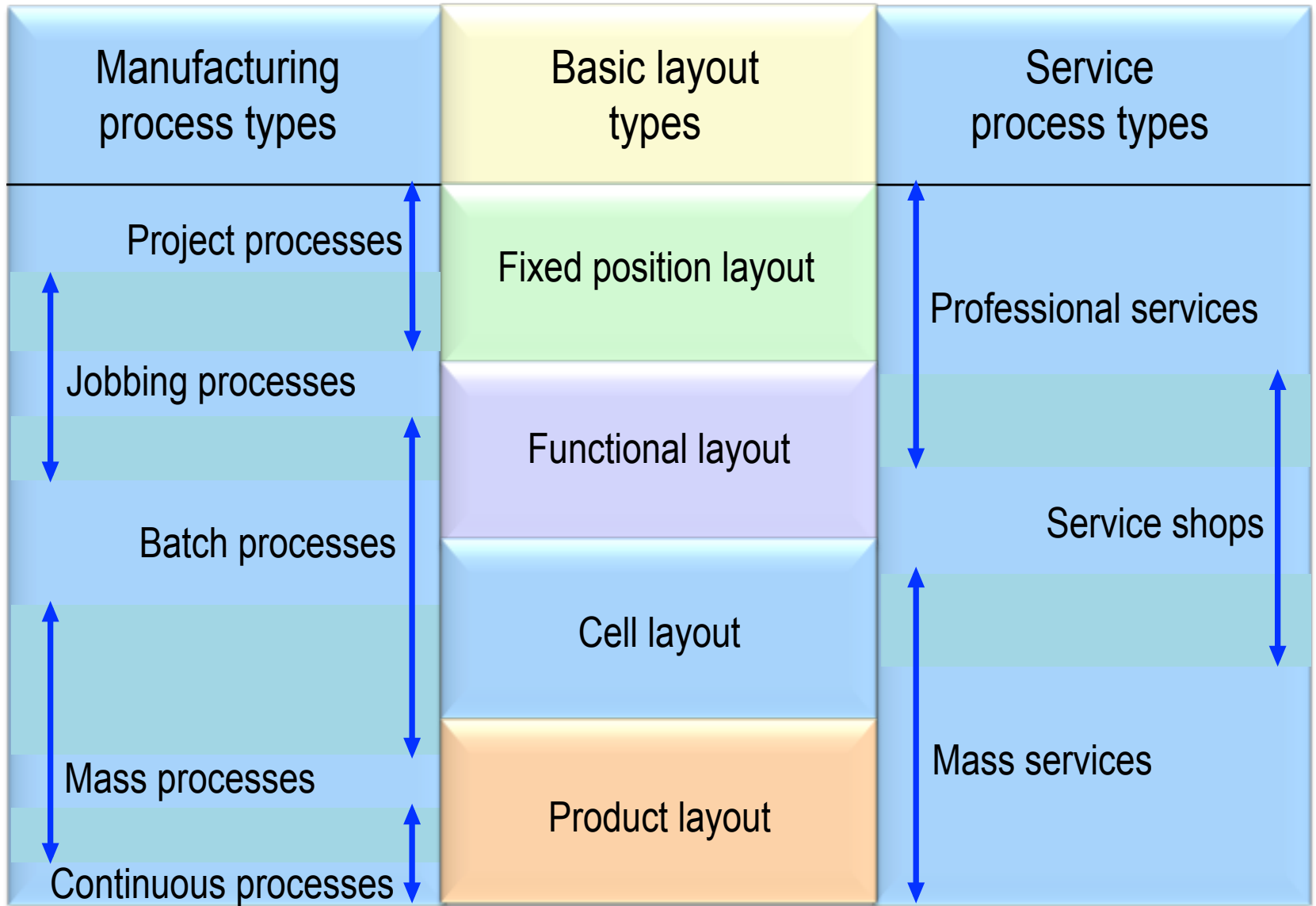


An Assembly Line

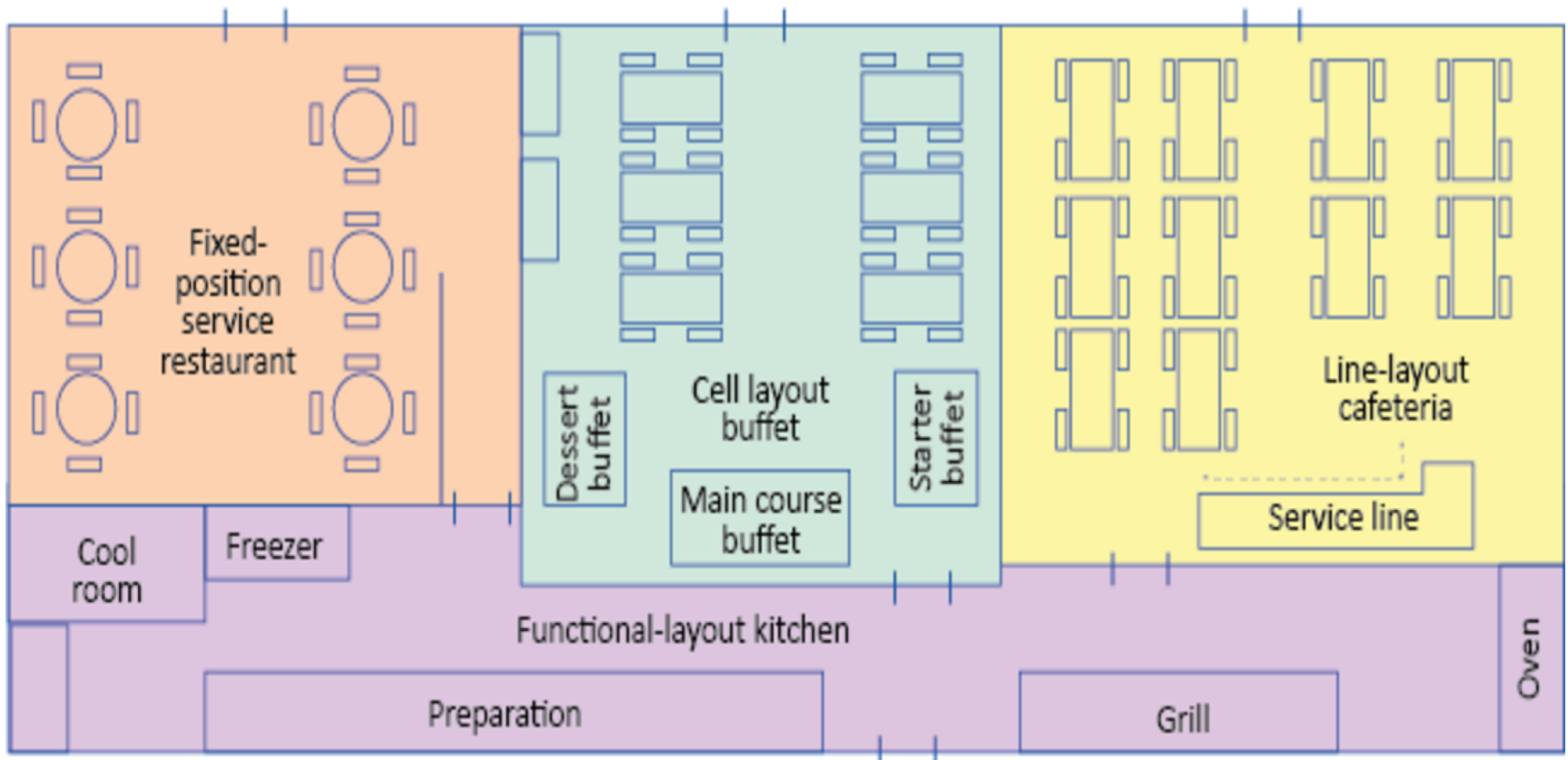
This layout is used when the flow of transformed resources is practically continuous and the operation has very high volume and low variety. In this layout, transforming resources are located in a sequence defined by the processing needs of a product or service. It is also called a line layout because assembly line manufacturing is the prime example of this layout type. The resources in this layout flow along a line of processes according to their particular needs.

Generic Advantages and Disadvantages

	Fixed Position	Functional	Cell	Product
+	<p>Very high variety & mix flexibility</p> <p>Product/customer not moved</p> <p>High variety of tasks for staff</p>	<p>High variety & mix flexibility</p> <p>Relatively robust in case of disruptions</p> <p>Easy to supervise</p>	<p>Good variety & mix compromise</p> <p>Fast throughput</p> <p>Group work can result in good motivation</p>	<p>Low unit costs for high volume</p> <p>Opportunities for specialisation of equipment</p>
-	<p>Very high unit costs</p> <p>Scheduling space & activities can be difficult</p> <p>High variety of tasks</p>	<p>Low utilisation</p> <p>Can have very high WIP</p> <p>Complex flow</p>	<p>Can be costly to rearrange existing layout</p> <p>Can require more equipment</p>	<p>Can have low mix flexibility</p> <p>Not very robust when facing disruption</p> <p>Work can be very repetitive</p>



Different Layouts can exist



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