

Methods of production

2019-02-28

Glossary

Product-Process Matrix The vertical axis of the Product/Process matrix represents the type of production process in the company. In the questionnaire, it was asked what proportion of the products are produced in a unit production process, in small, medium or large batches, and in a continuous flow process.

Work Content The total amount of work required to produce a unit of output

Work-in-process (WIP) Amount of customers/products in the process

Throughput time (TH) The time for WIP to move through the process

Cycle time (CT) The average time between units of output emerging from the process

Nature of Production processes

Process Tasks	Process Flows	Variety	Volume
Diverse/Complex	intermittent	high	low
I	I	I	I
I	I	I	I
I	I	I	I
Repeated/Divided	Continuous	Low	high

Prototype Process

V

Jobbing Processes

(E.g. Rolex watch manufacturing)

V

Batch Processes
 (Range of size differentiates Batch
 from Mass process)
 V
 Mass (line) processes
 (Bricks, BIC pens et cetera)
 V
 Continuous Processes
 (Highly capital-intensive and automated
 Difficult and expensive to start/stop
 the process. E.g. Nuclear facility/glass
 burning oven.)
 V
 Professional service
 (Clients spend a considerable time in the
 service process. There are high levels of
 customisation)
 V
 Service Shops
 (Medium levels of volumes of customers
 Medium levels of customer contact, levels
 of customisation and staff discretion.)
 Mass Service
 (High levels of volumes of customers, low
 levels of customer contact, customisation
 and staff discretion.)

Classifying Products and Processes

Low Volume production processes allow higher diversity and complexity of the product being produced as well as higher intermittence. The higher the volume, the greater the decrease in complexity, skills needed for the job and the nature turns to being a repeated process with divided tasks and continuous process flow. Examples could be seen in the comparison between a *factory belt item* such as *Nutella* vs a luxury item such as a *Hèrmes* bag. The differences are clear, one product's process tasks are standardised and repeated while having great process flow throughput, where as the other product requires lots of skilled, labour-intensive complex work and thus also takes longer.

A professional Service would classify as a low-volume, high-variety. Where as a Mass service would be the opposite. In the medium, we see the service shop class.

Product-Process Matrix

Deviating from the *natural* diagonal on the product-process matrix
Has consequences for cost and flexibility

Deviating from the 'natural' diagonal on the product-process matrix has consequences for cost and flexibility

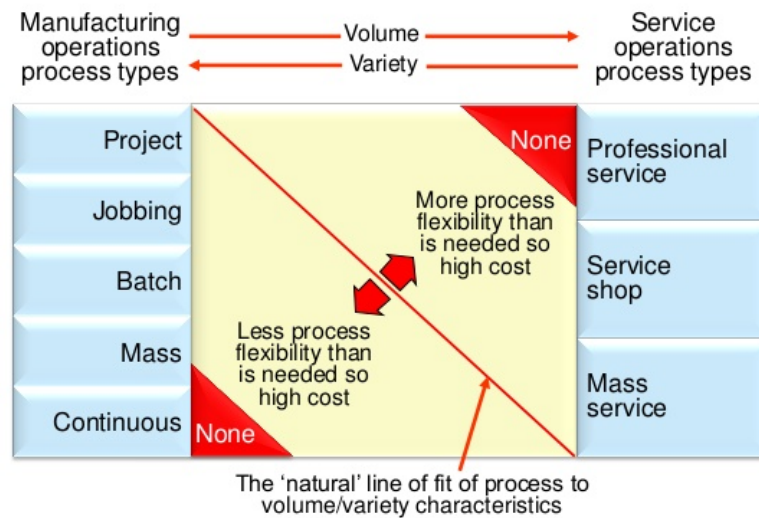


Figure 1: Classifying Products & Processes with the product-process matrix

Little's Law

$$\text{throughput (TH)} = \text{Work in Progress (WIP)} * \text{Cycle Time (CT)}$$

Deviating from the 'natural' diagonal on the product-process matrix has consequences for cost and flexibility (Continued)

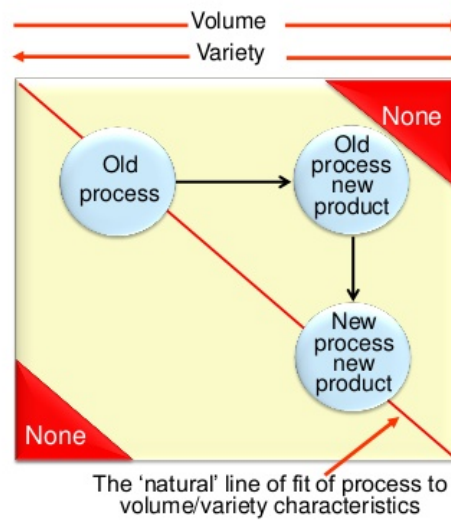


Figure 2: Changing the Products & Processes and seeing their effect in the product-process matrix