

# Manufacturing and public sector

[Business](#), [Industries](#)



As we all know, the world constantly changes, and thus, the business environment does also. As technology changes and people's thinking changes, so must the business organisation. If a company does not keep up with its competitors who do find ways to improve their processes, it may not last too long. Lean, flexible and agile are newly developed concepts to help the organisation succeed in such a competitive environment. Lean, flexible and agile in manufacturing

Lean Production, also as the Toyota Production System, is initially promoted by Massachusetts Institute of Technology. The driving force behind this adoption is to provide value to its customers in the form of high quality, low cost, and on-time delivery. Primarily, lean production integrates product design, supply, distribution, manufacturing, accounting, marketing, and management under an umbrella of concurrency. Other related topics are identified as political, legal, and social concerns.

Key areas of lean production are improving quality and eliminating waste, which including five principles: a) Build products that meet customer requirements at the exact rate of customer orders; b) Practice just-in-time techniques for obtaining, using, and distributing resources; c) Think of workers and machines as separate and don't tie one worker to one machine; d) Let machines wait for workers; e) Design a system that signals visually or audibly any variation from standard in the operating system.

Lean production is described as being different from mass production in that it uses half the factor inputs - half the human effort, half the manufacturing space, half the investment in tools, and half the engineering hours to

develop a new product in half the time. Also it requires keeping far less inventory on site, produces fewer defects, and enables a greater and ever growing variety of products. Implementing lean production therefore means eliminating waste in the production system, be it in the form of materials, labour or plant capacity.

However, lean production is not an alternative to mass production but is a means of enhancing it. Mass production means simply the manufacture of items in large numbers, thereby exploiting economy of scale principles. In fact the waste elimination concepts of lean production can equally be employed in other production systems including projects, batch production (in job shops) and continuous processing. Thus, in theory, leanness is an over-arching concept that is compatible with any production system and complement.

However, in practice, a difficulty arises from the use of 'labour productivity' as a measure of leanness as is often advocated by the lean production proponents. This naturally presumes a high level of automation, which in turn increases the company's fixed costs, making it less sensitive to changes in demand. By adapting Lean Production methods, many companies are improving cycle times, speeding the response to customers, reducing inventories and set-up times, increasing total business productivity, developing highly trained workforces, focusing on reduction of waste.

This concept has been so successful that it is frequently imitated, and the approach has been applied in the areas of Product Development, Service Delivery, and Business Management Systems. Flexibility is a feature of the

company's production system. It is the inherent ability to adjust or modify its resources deployment according to new or changing demands in the market. In the current competitive environment surrounding manufacturing industries, a defensive approach responding to the pressure for survival is through making the human resources, machinery and other facilities flexible.

When consumer preferences are unknown, manufacturing flexibility is exploited to both adjust to market demand and to gain information about this market. As the name implies, flexible specialisation overturns the industrial commitment to standardised products, and does so by producing smaller batches of differentiated goods through the use of general-purpose flexible machinery and new forms of work organisation. It includes design flexibility and production flexibility. Design flexibility is the company's ability to introduce new products and modifications to current products.

Production flexibility is the company's ability to change the product mix within short lead times, such as day to day. One aspect of flexibility is to switch workers between tasks. This may be horizontal - switching between different tasks of the same basic nature (switching between different assembly jobs, for example) - or vertical, in which workers accumulate different types of tasks, such as production work, quality control and maintenance. Flexible manufacturing facility is another aspect of flexibility.

It is an integrated framework to analyse trade-offs between benefits of flexible technology facilities and higher investment costs. In general, the term 'flexible manufacturing' has been used to describe new forms of industrial organisation which differ from mass production and are strongly

oriented to a rapidly changing market, which means combining the craftsman ability to make customised products with the economy of the assembly line. Mass production is an attempt to produce a single good at the highest possible volume to reduce costs through economies of scale.

Flexible production is the effort to make an ever-changing range of goods to appeal to specialised needs and tastes with tailored designs. The mass producer thus runs its factory through a hierarchical system of management, adopting strategies that deskill the work force, and require dedicated, single-purpose equipment. By contrast, a flexible firm adopts strategies that require a highly skilled work force operating with minimal supervision, general-purpose machinery, and close co-ordination with other producers. Below is the summary comparison between mass production and flexible production.