

# The ford assembly line management essay



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An assembly line is a line of factory workers and equipment that produces a product as it moves consecutively from station to station on the line until completed. Assembly line methods have become considerably more sophisticated since the first moving assembly lines were introduced in the automobile industry in the early part of the 20th century. Assembly line methods were originally introduced to increase productivity and efficiency by reducing the amount of manufacturing time required to produce a finished product. Advances in assembly line methods have the same objective-to increase output, or the number of products produced in a given period. While assembly line methods apply primarily to manufacturing processes, they can also be applied to other areas of business ranging from product development to management.

A look at the introduction of the moving assembly line in Ford Motor Co.'s Highland Park, Michigan, plant in 1913 and 1914 reveals some of the basic principles and objectives involved in the development of assembly line methods throughout the 20th century. As assembly line methods were introduced, manufacturing tasks became minutely divided and closely timed. So, it was that in 1913 he revolutionized the way we work with the introduction of the continuous assembly line. With the workers staying in one place, adding parts to the evolving vehicle as it moved past on the conveyor belt a great deal of time was saved. Parts were also delivered to the worker by way of conveyor belt. Manufacturing became a highly mechanized process in which mass manufacturing was performed largely by unskilled workers. The assembly line cut down on human handling, and machines were designed to handle multiple tasks. The moving assembly line was a

great success and the Ford Motor Company became the largest car manufacturer in the world. Business men the world over would flock to Detroit to glean the secrets of the moving assembly line that was making Henry Ford a very rich man.

A key factor in the development of the moving assembly line was the mechanization of materials handling. Before power-driven conveyors were introduced to move materials in the automobile industry, they were commonly used in such industries as brewing, milling, canning, and meatpacking. The first power-driven conveyors in the Ford factory transported materials to individual workstations. Later they moved parts while workers worked on them.

Moving conveyors were first applied to Ford assembly operations in 1913 in the flywheel magneto assembly, part of the car's electrical system. Originally one worker took 20 minutes to assemble one unit. Ford's production managers looked at the operation and broke it into 29 separate operations that could be laid out along a moving belt. Assembly time dropped dramatically to only 13 minutes, then to five minutes after additional adjustments were made.

After Ford's success in applying assembly line methods to the flywheel magneto, as many manufacturing processes as possible were divided into a series of single work tasks that could be performed along a moving conveyor. By April 1914 Ford had introduced an electrically driven endless chain conveyor that moved the auto chassis down the line. This enabled Ford to increase production from about 475 cars in a nine-hour day to more than

1, 200 auto assemblies in an eight-hour day. Ford tripled its production and reduced labor time per vehicle by nearly 90 percent.

The increased throughput at Ford's Highland Park plant required the installation of power-driven supply lines. Subassembly lines were laid out to feed into the main assembly line. When Ford built its famous River Rouge plant, automobile manufacturing became one continuously moving process, from the unloading of raw materials to the loading of completed vehicles onto railroad cars.

Ford's success with assembly line methods allowed Henry Ford to make good on his promise to build a car for the multitude. Manufacturing a single model, the Model T, Ford standardized the car's design, streamlined production, lowered costs, and made cars available to nearly everyone. Beginning in 1909, the first full year of assembly line production, the Ford Motor Co. increased Model T production from 17, 771 vehicles to 202, 667 in 1913. In 1924, the Model T's peak year, some 1. 8 million cars were produced.

Ford's ability to mass produce the Model T inspired the revolution in business thinking that led to mass production and mass consumption of other goods. During the 1920s, for example, refrigerator production went from fewer than 5, 000 units to almost 1 million. Radio production jumped from zero to 5 million units. The combination of standardization and assembly line methods not only resulted in a better material standard of living for many Americans, it also ultimately extended into the wartime production of U. S. industry during World War II, where the Allies gained a substantial advantage through the application of mass production methods.

## **Fordism and Taylorism**

“ Fordism” refers to this policy of winning the loyalty of workers to profit from a high-wage economy, by producing commodities for the masses as cheaply as possible by the application of assembly line techniques. Ford did not invent the assembly line. The idea of the moving belt originated in the 19th-century meat-packing industry in Cincinnati and Chicago, and the mass production of absolutely uniform components for later assembly, originated in the Colt gun factory. The Waltham Watch Company invented the “ transfer machine”, precursor of the industrial conveyor belt, in 1888. The word “ automation” was, however, invented by Ford, in 1940.

Taylor Winslow was a U. S. engineer and management consultant. He was the originator of the concept of “ scientific management”, to increase worker output. He was the first to carry out a scientific study of industrial management. According to Taylor, industrial productivity was lower than it ought to be due to two factors: deliberate malingering by workers and unscientific design of work practices by management. The symbol of Taylor’s management methods was the stop-watch, ever-present as supervisors conducted “ Time and Motion Studies”, timing every hand-movement, every step, and every breath a worker made.

Taylor’s system of management corresponds to the early development of mass production and assembly line manufacture, and is characterised by extreme elaboration of the division of labour, the reduction of work to machine-like repetitive operations, and extreme labour discipline and supervision of work, aimed at minimising production time per unit of commodity.

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Prior to Taylor, productivity was presumed to be achieved by reducing the number of “ non-productive” workers, such as clerks and supervisors; a proportion of 10% was regarded as the upper limit for such non-productive workers. Taylor, however, advocated achieving efficiency by close observation and control of the labour process. By breaking the production process down into its constituent parts and measuring the time required for each minute operation, observing and measuring every movement of the hand, the productivity of individual workers could be greatly increased. This meant, however, employing large numbers of supervisors and clerks, with up to one in four being employed doing such supervisory tasks.

### **Toyotism (Fordism+Taylorism)**

Toyotism (or Toyota-ism) is the term often used, by analogy with Fordism and Taylorism, to refer to the management culture and labour processes dominant in Japan, the USA, Europe and other developed capitalist countries in the latter part of the twentieth century.

Toyotism also alters the relationship between buyer and seller. While demanding of its supplier’s just-on-time delivery of components, the producer tirelessly polls its market for direction regarding the product to be produced. Instead of producing a product and then drumming up a market, the market is found first, and then the product produced to fill the demand.

This division of the workforce into a relatively privileged, full-time, relatively secure core of loyal, skilled workers on the one hand, and a mass of part-time, casual, often female or immigrant labourers on the other, is however one of the features of what is called Toyotism. Toyotism depends on this

culture of labour-management cooperation, multi-skilling and cross divisional problem solving, and it is the creation of such a culture that is the first requirement.

The most illustrious pioneer of Toyotism methods was Ohno Taiichi (1912 – 1990), Toyota's production-control expert, who devised the just-in-time system (kanban) of manufacture, which raised Toyota from near bankruptcy in 1952 to become the third largest automobile maker in the world, behind General Motors and Ford. He was able to create and introduce workers' involvement in developing production methods and gave a genuine level of autonomy to the worker, autonomy, of course, which was dependent on his/her absolute loyalty to the company.

These methods allowed automation to be used in quite a new way: instead of the production workers' role becoming more and more abstract, workers were responsible for the final product and small numbers of highly skilled workers could achieve very high levels of productivity, subjecting production methods to continuous improvements.