

Toyota philosophy of kaizen



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In the bend of the seventies, the scientific management (Taylorism and Fordism) appears in gap growing, out of step with the new standards of the society. Henceforth markets require diversified and reliable (even individualized!) products. That implies flexibility, reactivity, innovation. These constraints require the implication, the motivation, the versatility, the initiative and the ability to react from the employees, to the detriment of strict submission and obedience. A new logic of production (adaptation of the productive system to the requirements of the market) was required: Toyotism appeared.

Toyota Motors Corporation is today the largest vehicle manufacturer in the world. Toyota's success is due to two mains techniques created by Taiichi OHNO (1912-1990), a former president of Toyota in order to compete with the American car industry (Ford particularly). He invented the "TPS": Toyota Production System, also named Toyotism and the "JIT": just in time. This model was implemented by Toyota since 1962. Those working organization forms were then broadcasted to the USA and Europe.

First we will define what is Toyotism, then we will study the evolution of the Toyotism forms and finally, we will see how Toyotism lead to Toyota's management today.

About Toyotism

Major principles

Toyotism has two major principles: the "just in time" system and the "autonomation" system.

The “ just in time” system which means production in “ just in time” conditions contributes to eliminate inventory. Indeed, stocks are very expensive for the company because it is necessary to conserve goods in perfect shape in huge buildings. Indeed, some goods require a special preservation system which can also be very costly. You also need to pay for storage building. Moreover, the produced goods have generated costs (especially in a country like Japan where space is limited), that are not compensated by sales.

More precisely, inventory reduction relies on the Kanban method that consists in producing when demand manifests itself. We start from the command sent to the company to go back upstream to the fabrication level. Thus, it is the final consumer that launches production. Production is then said to be in “ tight management” or in “ tense flows”, contrary to Fordism.

Indeed, thanks to just in time (the approach of continuous and forced problem solving via a focus on rapid throughput and reduced inventory), products or raw materials necessary to production arrive when and where they are needed. No more waste and no more delays, so it reduces costs! Thus, the JIT production helps reducing cost by eliminating waste, removing variability and improving throughput.

Autonomation (= autonomy + automation) or auto-activation is the second Toyotism principle. The kaizen perfectly describes the principle of continuous improvement of the system. The kaizen is the principle of empowerment of the teams to define standard durations of production and to divide up the diverse manufacturing operations of a product, in order to work more

effectively and faster. Empowerment is based on the despecialisation and on the flexibility of the workers. For instance, simple and cheap stop devices are equipped on machines, which allow the supervision of several machines by the same operator. In case of a breakdown or a defect, the worker stops the assembly chain and tries to solve the problem himself. Thus, the employee has to be versatile and qualified enough. Machines are more automated and workers are more autonomous! They improve the human aspect of automation.

A new working organization form

Through those two innovations: the “ just in time” system and the “ automation” system, Toyotism aims at obtaining the “ 5 zeros”, also qualified as “ Lean Production” in USA. The Toyotism method consists in reducing production costs, avoid overproduction, reduce delays and produce the best quality possible. So the five conditions are:

- 0 delay (Just in time production. This method consists in waiting for the commands before producing but they need to be very reactive.)
- 0 stock (No overproduction so no inventory cost.)
- 0 paper (No intern paperwork and hierarchy weakening.)
- 0 default (No good has to be faulty, so as to avoid reparation costs and to satisfy the client)
- 0 weakening (Thanks to a regular and rigorous maintenance, machines have no defect.)

Any activity or decision that does not add value in the customer’s mind is considered a waste. Indeed, it is the customer who defines the value of the product. Waste reduction is an effective way to increase profitability.

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Therefore, Taiichi Onho identified seven categories of wastes:

1. Overproduction(as seen above, overproduction requires inventory which is a waste of money)
2. Waiting(idle time, storage and waiting are wastes: indeed, if an employee has to queue for his material to start working, you pay him at doing nothing but waiting! Also if a good is neither being transported nor being processed, it is waiting and a good kept waiting is a good that is not being sold, so it's a good that does not generate revenue.)
3. Transportation(every time you move a product, you take the risk that it can be damaged or lost or delayed. Moreover, transportation is expensive and it is a real cost that does not add a special value to the product.)
4. Inventory(inventory represents an outlay because your raw materials, work-in-progress (WIP), or finished goods are not producing any income or added value.)
5. Motion(unnecessary movements of equipment or people)
6. Defective products(new extra costs are incurred when your products are faulty: you have to face returns, warranty claims. Sometimes you are also obliged to change all the components or to reschedule the whole production! Defects are a waste of time and money.)
7. Overprocessing(doing work that adds no value in the eye of the customer, or using very precise, complex and expensive manufacturing machines when they are not necessary, is a waste.)

To sum up, Toyotism principles are the continuous improvement of the processes (kaizen) by the engineers of production and by the operators

themselves, and a production running downstream. Indeed, the buyers' orders are given to the production center then executed. It authorizes a lot of flexibility and eliminates stocks; the production that is made in tense flows.

Toyotism combines the principles of versatility and autonomy of the operators to improve the productive efficiency. Toyotism seems to reconcile productivity and efficiency, and considering the human factor, to propose richer and more developed tasks. But all these aspects require to produce quickly very diverse cars of excellent quality. Thus, it is important to determine a work organization that can reconcile speed, flexibility and quality. Indeed, despite of its evident successes, Toyotism is today disputed by the workers themselves. It seems that productivity gains in the Japanese factories were obtained by a “ stress management”, it is to say by a tension, a permanent pressure from executives and engineers on the workers.

Finally, the employees' implication and motivation is obtained by stress.

Evolution of Toyotism

Toyotism dissent

Inquiries on the working conditions have highlighted that the application of the Toyotism, far from leading to self-fulfillment of the workforce, was, on the contrary, translated into work intensification. Indeed, the work is often less repetitive than in the past and certain painful physical tasks were able to be mechanized, but other constraints have appeared.

The production running downstream means that the production has to react to the requests of the clients. In a company such as Toyota, these requests

are obviously indirect: they express themselves through the variety of the production in answer to the demand of the distributor. As an example, Toyota factories can build eight different models on the same production line and the company proposes 60 different models in Japan, without counting the specific versions in the production units outside Japan. The subcontracted parts, such as seats are ordered to the supplier once the car has entered the production line, and are delivered in a few hours. So the deadline constraint is intensified by the production in tense flows.

Previously, the operators negotiated their rhythm or their working time with the Direction. In the new organization, it ensues from interactions with the clientele. A commercial constraint is added to the industrial constraint. The impact of the work organization is increased by the use of information and communication techniques which deepen the commercial constraint. For example, the devices of traceability allow the customer to know at any time at what stage is his order is, and who deals with it! More and more employees have standards and deadlines to meet, in order to answer quickly to the demand requirements.

Besides the extension of the work under cadence, we observe an increase of the repetitive work. The “ versatility” consists, for an operator, to perform several successive elementary operations of a manufacturing line. So the versatility remains confined in elementary tasks: the worker must be able to adapt himself to the new simple and repetitive tasks imposed to him. It corresponds more to a flexibilisation of the tasks than to an enrichment.

The polyactivity doesn't imply an important increase of the qualification of the operator: the autonomy is to be put into perspective. Furthermore, the part of the individual decision-making in the daily activities of the operator remains very limited.

All these arguments can explain why the workforce quickly contested Toyotism: improving this new production logic was imperative.

New forms of Toyotism

In order to answer and react to the growing dispute and to be more productive, Toyota developed and improved new working organization forms. These innovations are implemented differently depending on the production site.

Quality circles

Quality circles are meetings held outside working hours and on a voluntary basis, to solve certain problems and perfect the production process. It's a workgroup consisting of operators and executives, established around the kaizen activities, which covers questions of quality, maintenance, safety, cost price. Besides, it allows to defuse conflicts, which are sources of losses for the company. By favoring the communication between the employees, through regular meetings, the mobilization and the motivation of the employees are increased, and the quality of products improves.

The post rotation

It consists of a workforce rotation on the various posts of the same assembly chain, to break the dullness of the work. However, the rotation did not really become widespread, probably because not so much needed by the company.

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The task extension

It consists in grouping together various tasks for the same workstation. The task extension contributes to limiting the horizontal division of the work.

The task enrichment

It consists in improving the workers' motivation by augmenting the interest of their work, by adding for example tasks considered more developing such as the control, the maintenance. The tasks enrichment contributes to limiting the vertical division of the work.

The participative management

It consists in associating the employees to the process of decision regarding the organization of the daily work, the evolution of the results.

The management by objectives

The superiors assign objectives to their subordinates, without defining precise modalities, and they will be evaluated on the difference between the objectives and the obtained results.

The semiautonomous teamwork

It consists in constituting a group of workers whose members are in charge of defining by themselves the working modalities allowing them to reach the company objectives. This mode of organization relies on the auto-organization and the self-regulation of the group, because the group is collectively responsible for the production.

During the 70s, Toyotism was seen as the key to assert in competition. Indeed, the decline of costs, the productivity and quality improvements were more organizational innovations than technological innovations. But the functioning conditions of Toyota's productive organization cannot be pushed farther, in particular as regards the tension on the flows of supply and on the working strength: the intensity of the work cannot be any more increased!

Management in Toyota today

Management development and learning organizations

Since the 80s, the set up system meets certain limits (seen above) and, confronted with new elements such as the decline of the dollar and the increase of the yen, as well as the sourness of the international competition, Toyota had to opt for new strategies. Thus, Toyota adopted an offensive strategy but also a defensive strategy.

The defensive strategy consists in favoring a policy of internationalization of the production. Major principles are that products, production centers and management must be adapted to the working local conditions. Furthermore, the local profits must be reinvested locally.

Nowadays, Toyota really focuses on understanding the consumer needs and his wants.

As an example, today, most of Toyota's plants are outside Japan. They implanted their manufactures where the demand was, in order to better to satisfy it and to reduce transportation costs. Moreover, transportation does not add any value that the customer is eager to pay for. Instead, the customer is willing to pay the product less, whereas, because of

transportation, the price increases. This is a concrete example of Toyota's new management. Toyota can easily satisfy the demand because Toyota is where the demand is.

The offensive strategy consists in looking for a diversification in production. As an example, a branch of Toyota dashed into Research & Development and into electronic production (integrated circuits).

In the book "Toyota Way" written by Jeffrey Liker, 14 management principles are identified. According to the author, those principles make Toyota the world's greatest manufacturer. "Become a Learning Organization" is one of these principles. It's possible to summarize Toyota's learning organization in three key elements:

1. Identify root causes and develop countermeasures.
2. By asking the question why as many times as possible, Toyota determines the root cause of a problem.
3. Use Hansei: responsibility, self-reflection, and organizational learning.

Hansei is a concept that Toyota uses as a practical improvement tool like Kaizen: improvements are fed back into the organization and then disseminated.

Utilize policy deployment (Hoshin Kanri)

This method consists in fixing strategic goals, measuring today's success and planning the future: Toyota wants measurable and concrete objectives.

Toyota has well understood that the learning by the practice (learning by doing) allowed every car to be more effectively produced than the previous

one. The learning by the practice is the increase of the knowledge bound to the exercise of the productive activity.

The continual evolution of the organization is justified for any complex process because the problems and the ideal solutions do not appear immediately at the stage of the conception of the process of production; it is also the consequence of the adaptation to the market.

Toyota's culture: the Toyota way

The Toyota Way describes the promoted values that comprises Toyota's culture and guides the daily decision making of its employees. It rests on 2 fundamental pillars:

- Challenge: seeing problems as challenges will help improving the global performance.
- Kaizen: continuous improvement which is embedded in the belief that employees should come to work each day with the goal of becoming better than the day before.
- Genchi Genbutsu: going to the source to find the factors that can help make the best decisions, build consensus and achieve goals. As an example, a solution is easily built around arguments based on facts rather than relying on hearsays.
- Respect: expressing different opinions in ways that respect others, emphasizing everyone for their skills and knowledge, trying to understand and listen to each other, building mutual trust
- Teamwork: sharing knowledge, maximizing individual and team performance, putting the firm's interest before individual interests.

The goal of such an organization is to match people with tasks that inspire them and that best utilize their abilities. It is also to design tasks and strategies that can cope with environmental demands and opportunities. The firm's culture should reinforce these efforts. One of the reasons Toyota has been so successful for so many years is the alignment among these aspects. Toyota's culture is very strong and it is a real strength for the company, the Toyota way will hopefully help sustain their success in the future: until today, no other company could have the same specific culture. Toyota tries to combine adaptation and quality within an organization leading to qualification.

Conclusion

Toyota was a formerly small company that outwitted bigger competitors to become the world's largest automaker, thanks to the philosophy of continuous improvements. The expectation of this philosophy is that empowered employees will work with a committed management to build systems that respond to customers with ever-lower cost and higher quality.

Their current success is not their final achievement, they are never satisfied and always want to improve their actions. Toyota wants to discover and improve better alternatives, rethink their accomplishments, investigate future possible successes: they commit to improve continuously!