CONSIDERATIONS BEHIND THE TOYOTA PRODUCTION SYSTEM WHY CLASS A STATUS CAN ONLY BE ACHIEVED BY TOYOTA

Siegfredo Peralta, Waseda University – GSAPS, Tokyo Japan Jinichiro Nakane, Waseda Institute of Asia Pacific Studies – Tokyo, Japan

Abstract

For the past decades many manufacturing firms wanting to replicate Toyota's excellent performance failed because they mistook Toyota's tools and practices for the system that will result to the desired competitive advantage? Unfortunately, firms that will once again endeavor to replicate Toyota's performance by adopting the four basic rules or disciplines as proposed by a study of Toyota's DNA will likely fall short of attaining the desired competitive advantage. This paper proposes that Toyota's DNA is better understood and replicable by analyzing Toyota's Corporate Culture.

The paper outlines the classification of manufacturing firms based on performance and presents a summary of literature on Toyota's DNA. It likewise explains why manufacturing firms are unable to sustain continuous improvement in performance and proposes a procedure in the brush-up on the TPS Kaizen Mechanism. Likewise, corporate culture is developed through Toyota's 3 C's namely: Competition, Collaboration, and Co-creation as being at the core of Toyota's DNA.

Finally, the paper recommends key actions essential in developing a corporate culture similar to Toyota that will help increase performance and Competitive Advantage.

1. Classification of TPS Users

Efforts in implementing TPS have resulted to varied levels of success. A rating system was commonly adopted by consultants in the manufacturing industry to classify each TPS users based on the observable characteristics of its manufacturing operations. The table provides a brief summary of characteristics of the Classification of TPS Users.

С	В	А
Focus on Technology (IT)	Implementing little projects	In depth-discipline
Single Set-up	Management as Torch bearer	Efficiency and better performance
		Small gap between planners and
Decrease Lot Size	Top-down	doers
U Lines	Special Projects	

2. Toyota DNA

In the study "Decoding the DNA of the Toyota Production System", Steven Spear and H. Kent Bowen propose that the keys to success in TPS is creating a community of scientist and implementing the problem solving discipline. They believe that Toyota's DNA can simply outline based on 4 rules. The 4 rules are as follows: Rule 1: All work shall be highly specified as to the content, sequence, timing, and outcome. Rule 2: Every customer-supplier connection must be directed, and there must be an unambiguous yes or no way to send request and receive responses.

Rule 3: The pathway for every product or service must be simple and direct.

Rule 4: Any improvement must be made in accordance with the scientific method, under the guidance of a teacher, at the lowest possible level in the organization.

Likewise, Spears and Bowen believes that installing built-in test to signal problems automatically, will transform a system to be more flexible and adaptable to the changes in demand for the product.

3. Why the 4 rules are inadequate to capture the essence of Toyota's DNA.

The 4 rules described by Spears and Bowen are observable in Japan, South East Asia, Australia, the United States, and Canada. A system to specify work based on content, sequence, timing, and outcome have already been installed by many plants. Many of these plants have their production schedules and work standards written and posted on boards located within the vicinity of the production line. Likewise, many have adopted a form of kanban system to simplify communication between customers and suppliers. In many cases too, the design of the flow of the products in the line was simple and direct, and the improvements done by work teams were under the guidance of an experienced leader or supervisor. Likewise, many have adopted a system to automatically trigger a signal when problem occurs.

Despite the presence of the 4 rules of Spear and Bowen, these manufacturing firms fail to receive Class A ratings by the consultants and local experts. There is a big room for improvement to increase the ability of the plant to sustain kaizen activities. Furthermore, more flexibility is required to be able to meet the demand for quality, quantity, cost, variety, within a shorter lead time.

We ask ourselves why, amidst the presence of the 4 rules, these plants failed to achieving class A TPS user status. Analyses of different hypotheses to explain the reason behind the shortfall are as follows:

Spear and Bowen proposes that the key to understanding TPS is creating a community of scientist. They note that the process of establishing a set of hypotheses that can be tested when defining a specification is Toyota's way of adopting the scientific method. Although it is true that Toyota people rigorously search for ways to find a solution to their problem, creating a community of scientist or adopting the scientific method is not the key to understanding TPS. Although it is understandable, that observing Toyota plants may give you the impression that indeed a scientific method or approach is at work. But in fact, what one observes is either a "scientific method" look-alike or a production line operated by scientists. The discipline required at Toyota goes beyond any form of scientific method approach to problem solving. The proposal of establishing community of scientist by adopting the scientific method may enhance the development of explicit knowledge but however will fall short of capturing the tacit knowledge.

TPS includes both explicit and tacit knowledge. At its best, the 4 rules of Spear and Bowen will establish a form of discipline and therefore facilitate for the development of explicit knowledge. However, if we were to outline Toyota's DNA, there is the need to establish how Toyota's tacit knowledge can be captures. The 4 rules cover only the surface of the tip of the iceberg.

Moreover, there is much debate as to whether the use of the word "DNA" is appropriate considering that strictly speaking, DNA in the scientific sense displays certain properties in contrast to the basic properties of the Toyota Production System. DNA is known to be naturally occurring in living creatures and likewise relatively easy to sustain. On the contrary, kaizen which is at the core of TPS does not naturally occur. Kaizen requires very aggressive efforts to achieve and sustain. In fact, the pitfall of many plants in adopting TPS is its inability of the adopted system or discipline to sustain kaizen. Adopting the 4 rules alone will most likely have the same result.

4. Understanding Toyota's Culture

Why do the plants in Japan and all over the world fail to achieve class A TPS user rating? Many have attempted to explain Toyota Production System and failed to include the essentials or key elements required to propose a system that can replicate Toyota's excellent performance.

In many cases, the plants fail to sustain Kaizen. There is no question with regards to the level of difficulty in introducing and sustaining kaizen. The problems are compounded when the "Crusaders or torch-bearers" for kaizen activities are transferred to other plants, move on to another firm, or simply retire.

Nevertheless, a better way to understanding TPS and developing both explicit and tacit knowledge is by understanding Toyota's Culture. Knowing about Toyota's IT and it, Genba-shugi, Competition, Collaboration (Cooperation), and Co-creation explains the Toyota Culture.

5. Toyota's IT and it.

The Toyota Production System is composed of both "IT" and "it". "IT" refers to the technical side of TPS. IT includes Kanban, single unit lot size production, U-lines, Jidoka and other technical systems leading to a greater awareness of problems in the shop floor that serves as a trigger for improvement. (Please refer to the Figure on Kaizen Mechanism in TPS.)

The IT increases the technical abilities and strengthens the production system infrastructure to achieve greater levels of flexible in manufacturing. However developing the infrastructure by implementing IT element such as Kanban may be quite difficult and less effective if no consideration is given to implementing the "it" of TPS. Toyota's "it" includes the concept and philosophy of TPS. The main contribution of "it" is to developing the people's skill and capabilities through an in-depth involvement in Kaizen Activities. The desired improvements are achieved and the corporate culture strengthened.

6. Infrastructure and people ware development.

TPS is best understood by analyzing How Toyota develops its Corporate Culture. The way to replicate Toyota's Class A performance is by improving the manufacturing infrastructure, and more significantly developing the people.

The elements for the infrastructure development are: Infrastructure development, Discipline (DNA), Economic Environment, Market Condition, Technical Development, Industrial Structure (Supplier condition and logistics), and Social and Educational System (shift from control to development)

Peopleware development requires systems for: Changing the way of thinking of the Manager, Integrating and Harmonizing Planners and Doers, Adopting a Multiple-Scenario Planning Framework.

7. Why only Toyota can achieve class A Status

Toyota's success in class A status is the result of a collective effort of all team members in doing kaizen. Kaizen is viewed as an integral part of their daily work life. The awareness of the need for survival is the major consideration that motivates each team member to work for high levels of quality, efficiency, and decreasing lead-time. Part of this effort is to decrease all forms of waste and adopting different forms of preventive maintenance, cleanliness and order in the plant. Likewise, team members' value collaborations to further develop in-house technology and likewise learn new skills, provide greater competitive advantage over any of its closest rival.

Toyota's Unique Corporate Culture highly influences the team members' way of thinking. The Toyota Culture is characterized through competition, collaboration and co-creation. Descriptions of these characteristics are as follows:

Competition among the different teams in the production line is encouraged to increase performance. Competition takes place when solution to the day to day problems is needed. This further enhances the honing of skills among the workers. It is no secret that at Toyota, a set of skills required of each team member is outlined, monitored, and displayed in the work area. This likewise encourages the spirit of camaraderie among the team members and leaders and develops the right attitude of continuously identifying problems and determining the right solutions.

Cooperation is also encouraged among the different teams within the same shop or at times across functions within the Plant. New ideas or solutions created are shared with other teams that further enhance continuous improvement. Solutions to both common and unique problems are not only shared within the different shops within the Plant but at times shared with other teams in Toyota Plants all over the world.

Co-creation would be the highest form of relationship among the team members across the different levels of the Toyota Organization. This level of problem solving activity enhances higher levels of creativity. Co-creation ignites the creation of drastically new ideas and concepts, and at times paradigm shifts that propel Toyota to higher levels of flexibility and innovation. Doing kaizen at this highest level is viewed to be a form of recreation. Co-creation is the embodiment and epitome of the simple phrase, "doing new things together".

The Toyota culture is not only limited to Toyota or her subsidiaries but at times flow into her suppliers. In the US, close cooperation can be observed between Supplier and Main plant to the extent of actually providing working areas within the main plant's facility for the suppliers' technical people. As a result, solutions to technical problems are more readily available because of the close proximity of the technical individuals.

8. Genba-Shugi

SHUGI is defined as "the principle". Therefore, GENBA-SHUGI can be defined as the how management principles are focused on the importance of operations as actually performed in the work place, or shop floors.

In Japan, top management visits shop floors so often to find out which problems frequently occur. Oftentimes, it can be observed that the shop floor offers a lot of opportunities to cut costs and increase profits by eliminating wastes. We say that management have to solve problems through going down to the work place (shop floor)-GENBA, seeing the actual work- GENBUTSU, and solving problems based on the facts- GEBJITSU, together with shop floor people.

Likewise, GENBA-SHUGI is practiced in the following example: "When some problems happen in the operation, who knows the best what happens and why? Everybody answers operators or workers who actually perform the job know best. Is such operator's knowledge fully utilized? In many countries usually operators are just doers, and not be involved in problem-solving, in spite of their knowledge of what happens and hints for solving the problems. Workers should be a key element in the KAIZEN activities, and management has to encourage them to acquire simple problem-solving techniques and skills and participate in KAIZEN activities."