## Team Assignment 2 - BADM\_567\_SP23\_134

## Toyota Motor Manufacturing, USA, Inc.

**Toyota Production System (TPS)**

The conditions in Japan during the 20th century were characterized by several unique factors that contributed to the development of TPS. One of them was the need for Japan to rebuild its economy following the World War II. The other one occurred in 1980when the country experienced trade instability due to political pressure and various economic factors (like fluctuations of Yen). This led to a focus on efficiency and productivity in manufacturing, which ultimately led to the development of the Toyota Production System.

The unique aspects of the Toyota Production System include several key principles and practices that are designed to improve efficiency and eliminate waste in the manufacturing process. The most famous and important principles and practices are JIT (Just in Time), Kaizen, Jidoka, Andon, Kanban. Overall, the Toyota Production System is a unique and innovative approach to manufacturing that has helped Toyota become one of the world's most successful automakers.

Just-in-time (JIT) and Jidoka are two key principles of the Toyota Production System (TPS) that are related in their approach to the production environment. Both JIT and Jidoka are designed to address the unpredictability and problems that can arise in the production environment, by improving efficiency and quality, and reducing waste.

JIT production assumes that production processes are inherently unpredictable and subject to change (most likely will deviate from the plan), and that excessive inventory can be a significant source of waste. By producing only what is needed, when it is needed, and in the quantity that is needed, JIT production helps to reduce waste, lower inventory costs, and increase flexibility in the production process. This approach enables the TPS to respond quickly to changes in customer demand, while minimizing the risk of excess inventory or wasted resources.

Jidoka, on the other hand, requires revealing production issues whenever they occur and stop production until the problem is fixed. It recognizes that due to variability and unpredictability of the production environment deviations from planned operating conditions are inevitable. It states that problems and defects are a natural part of the production process. Rather than relying solely on inspection and quality control, Jidoka aims to build quality into the production process from the beginning. By giving machines and workers the ability to detect and respond to problems in real-time, Jidoka helps to prevent defects from being passed on to the next stage of production, or worse, being delivered to the customer. This approach ensures that quality is built into the production process at every step, reducing the likelihood of defects and the costs associated with rework, returns, and warranty claims.

JIT and Jidoka form a solid approach to production that addresses the unpredictability and problems that can arise in the production environment. JIT helps to reduce waste and improve flexibility (the first production environment uncertainty mentioned above), while Jidoka helps to prevent defects and build quality into the production process (the second unpredictability of the production process mentioned above). By combining these principles, TPS can deliver high-quality products at low cost, with a level of efficiency and responsiveness that is unmatched in the industry.

**Exporting TPS from Japan to the US**

Toyota recognized that laying the groundwork for a strong “human infrastructure” was critical to their success. Toyota needed people who exhibited critical thinking skills as the Jidoka principles required people who could demonstrate “good thinking”, internalize the Toyota’s culture of “sticking to the facts” and perform root cause analyses to fix problems. A critical component of this strategy is to ensure that Senior Leadership aligned with these principles and can execute on them by ensuring they could socialize the principles through the organization. Accordingly, Toyota made sure to build this capability by hiring and training top managers followed by the core operations team to ensure the principles were ingrained in the culture of the plant. Toyota sent trainers from Tsutsumi to Georgetown to accomplish this.

There were several notable aspects of their rollout in Georgetown. First, the trainer from Tsutsumi was there for a few years and instilled the culture through persuasion and having the new manager do things themselves vs. having the mentor showing them. This reinforced the need for people to critically think and problem solve. Second, Toyota implemented the plant process they already had success with in Tsutsumi and tried to replicate it as much as possible. For example, they produced the same car, the Camry, in Georgetown. This is notable as it reduces the variation in process between Tsutsumi and Georgetown, which provided them a good baseline to know they were starting with the same process as Japan. This would likely help isolate issues that were being driven by other things. For example, if they picked a different car to produce in Georgetown the defect could have been that the line being used in Tsutsumi was only good for the Camry, not another car. Finally, Toyota deliberately had a slower ramp up period for the plant rather than getting it running as quick as possible. This allowed for the implementation and execution of TPS as flawless as possible. If they took the approach of getting the plant running as quick as possible, it might have put their ability to execute in jeopardy.

Toyota recognized that having people that could execute Jidoka tools successfully required “human infrastructure” that could internalize the notion the company slogan “Good Thinking, Good Products” and laid out a training to do so. Prioritizing the practice of identifying and fixing problems resulted in frequent shutdowns at the plants, so they understood that having the human infrastructure that can analyze problems, find root causes, and proactively seek out new and better ways of doing something was the critical capability that enabled them to execute the Toyota Production System.

President Cho approached aligned with the cumulative capabilities perspective. The foundation of the strategy was to focus on delivering quality as he believed that quality would be an order winner for their customers and leveraged their capabilities to prioritize that. However, he also recognized they needed to build a cumulative set of capabilities and focused on next on productivity and cost. One way they kept holding costs down was by eliminating waste from overproduction, which in turn, allowed greater visibility into the bottlenecks in the production process. This emphasis on eliminating waste meant less need for storage space, unnecessary movements, and the focus on more valued added activities in the value stream. Furthermore, Cho recognized for Toyota’s execution to be on point they needed suppliers to be aligned with the TPS for their process to execute as they were used to in Tsutsumi to fully deliver just in time production.

**TPS techniques**

**Genchi Genbutsu -** The direct translation is “Real location, Real thing” 1, and what it means is that “go and see it for yourself”. It is part of the Toyota Production System, and the main objective is to make sure the production line is working at the maximum efficiency. The principle emphasizes the importance of physically visiting the location or process where a problem exists to efficiently solve the issue. This approach, employed in the Toyota Production System, emphasizes the need for management to have a strong presence on the factory floor to fully understand any problems before attempting to address them. The phrase is not simply about visiting a site, but rather about gaining a personal understanding of the larger context and implications of actions taken within a given environment. By confirming facts and analyzing root causes, individuals can better grasp problems and work towards effective solutions2.

**Poka Yoke** - is a Japanese term that means "mistake-proofing" or "inadvertent error prevention"5. It refers to any process mechanism that assists an equipment operator in preventing, correcting, or highlighting human errors that may lead to defects. The term poka-yoke is derived from the Japanese words "poka" meaning mistakes and "yokeru" meaning to avoid. The idea behind Poka-Yoke is that the Toyota Production System is focused completely on maximum efficiency and fault-free processes6. The primary goal of implementing Poka-Yoke is to prevent, correct or draw attention to errors as they occur, with the aim of eliminating defects. For instance, a jig that is used to hold parts for processing can be adapted to only allow the parts to be held in the correct arrangement, reducing the possibility of mistakes. Additionally, the term can refer to any mechanism built into a process to shape user behavior and prevent incorrect operation.

**Hoshin Kanri** - is a strategic planning methodology that originated in Japan and has been widely adopted by organizations around the world. It is a systematic and integrated approach to strategic planning that aligns an organization's goals and objectives with its resources, activities, and results. The term "Hoshin" refers to a compass or guiding direction, while "Kanri" means management or control3. Hoshin Kanri typically involves a series of steps, including the development of a strategic plan, deployment of the plan throughout the organization, and ongoing monitoring and adjustment of progress towards the plan's objectives. It emphasizes the importance of involving all levels of the organization in the planning and implementation process and focuses on building a shared understanding of the organization's strategic priorities and how to achieve them. Hoshin Kanri is often used by organizations seeking to improve their overall performance, increase customer satisfaction, and better manage change and uncertainty in their business environment4.

**Defective seats**

The issues TMM has encountered with their seats have had a negative impact on their operations. There are now more vehicles coming off the line that need to go to the overflow parking area for inspection because of these defective seats. This didn’t always hinder the assembly process because the car could be assembled, but it essentially added a further step for Quality Control to resolve defects that were noted in the process. Seemingly, this directly contradicted the resolution technique principle Jidoka. Jidoka was a key component of TPS and left Friesen contemplating if he deviated too far from the system. Another problem these seats caused was failing to deliver cars to the sales company on time and it meant that customers couldn’t receive their cars right on time as well. Also, there will be a chance to deliver the product with seat defect to customers. It will lead to a lot of complaints from customers, and this will negatively affect Toyota’s reputation. In addition, because the company can complete the car assembly without seat assembly, many unfinished cars will sit in the parking lot waiting for their seats to be replaced, which will increase inventory management cost.

One of the leading causes of this problem is the increase in seat combinations for vehicles. The new model of the Camry sedan has the same color options but offers five styles where the old model offered three styles of seating. The addition of the Camry wagon further complicated matters as there were several variations added to satisfy needs across the world. There were simply too many new variations of seats for KFS to produce the same level of quality.

The JIT model requires flawless execution and one hiccup along the way can lead to detrimental problems. With the significant increase in output and variations, the executives didn’t communicate well enough with KFS to ensure they could meet the volume and quality demands. KFS was an exceptional supplier based on prior needs, but TMM should have taken additional steps to ensure their volume and quality demands would be met with the new models.

Since the routine production systems do not stop their operations even after detecting defective seats, they hardly conform to the provisions of viable corrective measures as demanded by Jidoka. The Jidoka is a critical part of Toyota's success, so if this continues to happen, TMM will not be able to build quality into the production process.

There were two things needed to be done to address these issues going forward. First, the issues with KFS need to be addressed. TMM is losing valuable time and money dealing with issues they start with their vendor. This means they need to address those issues and determine if KFS can meet their needs or if they need to start looking at additional vendors. This would alleviate some of the demand from KFS and they could focus more on the quality they once delivered. Also, TMM may need to start looking for another supplier which provides recommended seats at a lower cost with no defects. Since Toyota has a multi-vendor policy, it corresponds with the company’s policy, and it also can give KFS some sense of urgency to improve the quality of their products.

Second, Friesen needs to address where these issues fall relative to TPS. We believe the ability to solve these problems in real time will lead to better results in the future, while also satisfying the foundational production system adopted by Toyota. By reconsidering their seat vendors to meet their needs and being able to address issues as they present themselves, our team believes they will be aligning their work with the principles that made the company successful.

**References:**

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