

Proposed Lean Sustained Factors

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Abstract— Many organizations around the world have implemented or in the throes of implementing Lean or Toyota Production System. Organizations that have successfully implemented a few years of TPS may face challenges to continue and sustain their efforts in the long term. The problem of sustainability in every new initiative including TPS, Lean Six Sigma, TQM, and Business Excellence needs urgent attention by researchers. This paper addresses some of the issues surrounding how to sustain lean and TPS in companies. It has been observed in literature and practice that two major approaches have been used by consultants, researchers, and practitioners on the adoption of TPS/Lean. Many have adopted the first approach which gives heavy emphasis and focus on tool and techniques; while the second method provide a much more 'people based' approach. The tool based approach is important but should not be used as the prime vehicle for continued successful implementation. The people based approach is believed to be the key to the continued sustenance of TPS or lean implementation. In trying to support this argument, interviews were held with Toyota experts, ex-Toyota employee, academics, and consultants to seek their opinions regarding sustaining lean and to further provide details of the lean excellence factors for sustaining lean. At the end of this paper, the authors have proposed a set of factors that can be used to determine sustainability of lean for companies.

Keywords— *Lean, TPS, Sustainability*

I. INTRODUCTION TO TOYOTA PRODUCTION SYSTEM

Toyota Production System can be defined as continuous improvement of processes through application of tools toward waste elimination as spearheaded by Toyota since its early years of formation. Lean, however, is new term coined from the work of Womack and Jones [1]. Toyota Production System has been around longer than it was first reported by Ohno [2]. Some may argue that TPS and lean are the same, however it is believed that they are not if one were to study carefully particularly in the people aspects of implementation and the thinking that goes behind the system. TPS can be traced from the time of Sakichi Toyoda when he planted the seed of a company which is technologically innovative using modern weaving machines and invented the concept of autonomation or Jidoka. Abundant research and publications have been produced by numerous researchers, academics, consultants and industrialists (see for example Holweg [3], Jasti and Kodali [4], Liker [5], Che Ani and Chin [6]).

The search continues as to how this way of managing a company emerge as one of the most widely adopted system today in whatever names including lean, lean six sigma, lean manufacturing, and lean system. Numerous old and new issues which are still unanswered or insufficiently explained on the understanding of TPS success. TPS has not only been implemented in automobile manufacturing but applied and researched in health care services, financial services, construction and offices in private and public organizations. The interest is high initially but as to other initiatives, it may start to lose momentum as time passes if the efforts put into TPS are reduced. One of the most critical issues in TPS or lean adoption by organization is sustainability of the initiative. Similar to TQM or other excellence based initiatives, the possibility of being neglected and failing is high when the organization implementing it are not aware of the factors that impede its sustenance. Therefore, investigating and determining the factors for sustaining TPS is crucial and useful for all organizations.

Sugimori et al [7] produced the first seminal paper on TPS and Kanban system. They explicitly mentioned that TPS and Kanban system was developed by the Vice President of Toyota Motors Corporation, Taiichi Ohno, and under his guidance this unique system has become deeply rooted since 1957 in Toyota. According to them, two distinctive features exist in the system; Just-in-time production system where 'only the necessary products, at the necessary time, and in the necessary quantity' are manufactured and second feature is 'respect for human' where workers are allowed to display their full capabilities through active participation in doing work and improving (kaizen) their workplace. They also expounded on the principles of TPS system. First, is 'putting forth all efforts to attain low cost production 'through reduction of costs by waste

elimination'. This involves continuously establishing a system that will thoroughly eliminate waste by assuming that anything other than minimum of equipment, material, parts, and workers (working time) which are absolutely essential to production are waste or surplus that only increases costs. Second, is to recognize true human potential and to make full use of the workers capabilities, both physical and intellectual. This in turn will enable employees to display their full capabilities from their knowledge, skills acquired and their own self initiatives. Realizing the full potential of employees through the use of human capabilities is different from abusing the workers since the ability to increase the level of motivation starts from a harmonious and exciting workplace. To achieve the TPS System, Toyota uses Just-in-time and Jidoka concepts and practices. The JIT is also called a pulled system where the concepts of 'piece flow' and Kanban (signaling and triggering the production and supply activities occur) are used. In order to be able to produce the required quantity, the production scheduling will need to be based on Heijunka (leveling production) based on standard work and tact time which is set periodically. Better ways of standard work will be searched through kaizen to achieve the target volume and at the same time problems solved though line stops of Jidoka using andon system. These are some of the intricacies of the TPS system.

Jidoka as a concept means 'to make the equipment or operation stop whenever an abnormal problem or defective condition arises'. Sugimori et al [7] emphasized the use of Jidoka as to prevent making too much and to control abnormality easier since it will reveal problems coming from the machines, parts, shop floor, and workers. Toyota views problems as important for innovation and operational excellence. Chambers [8] has also given a detailed account of the history of Toyota Motor Corporation. He gave detailed events and insights into the corporation success. Fujimoto [9] on the other hand has provided the manufacturing system from a more technical view laying down the basis of TPS relating to engineering and technological systems.

It is important to understand on how the Toyota System started. In 'The Birth of Lean – Conversations with Taiichi Ohno, Eiji Toyoda and other figures who shaped Toyota Management' [10], TPS actually emerged after the Second World War when whole of Japan were faced with survival issue. Raw materials such as steel, aluminum were not available and scarce. The new automotive industry lacks the engineering technology and know-how coupled with insufficient equipment and machines to produce cars. The only promising resource available at that time was human. They actually began making cars using brute force and physical energy. Ohno also saw the Ford production system in his visit to USA but believed that Japan cannot follow Ford's mass production style. He also for the first time went to supermarkets which provided him with the idea of a Kanban system of producing or delivering what is needed and when is needed. Just in time system focuses on reducing wastes, minimizing inventory and ensuring smooth flow of processes. Only make what customer wants and only buy material just enough for production using the minimum money available and get it out as fast as possible to be sold [11].

The purpose of Jidoka is to highlight problems; quality, quantity, and worker. It prevents flow of defects by stopping the line when there are problems such as machine breakdown, or when the worker is not able to complete the job within the tact time. Stopping lines means that problems will surface and needs to be addressed with urgency and rectified as soon as possible. Why? The faster it gets rectified the faster will product flow out without disruptions and the worker will be happier working in a production line with no machine downtime, no parts shortage, or parts quality defects and other line problems. Ohno insisted that standard work be developed and with that standard times also determined through tact time. This standard time will need to be continuously improved through wastes elimination from motion, waiting, unnecessary transport and others. To solve problem when line stops, the concept of genba genbutsu (go and see) was practiced by the managers, line leaders and the workers. It is a system pursuing perfection when everyone working in this situation understands its true purpose and its requirements. The so called lean tools such as SMED can be introduced when it is required at the appropriate situation and time. The key to many of these lean tools and principles is in identifying and eliminating wastes as emphasized by Ohno [12]. These practices and all the lean concepts have been simplified in a framework as shown in Figure 1.

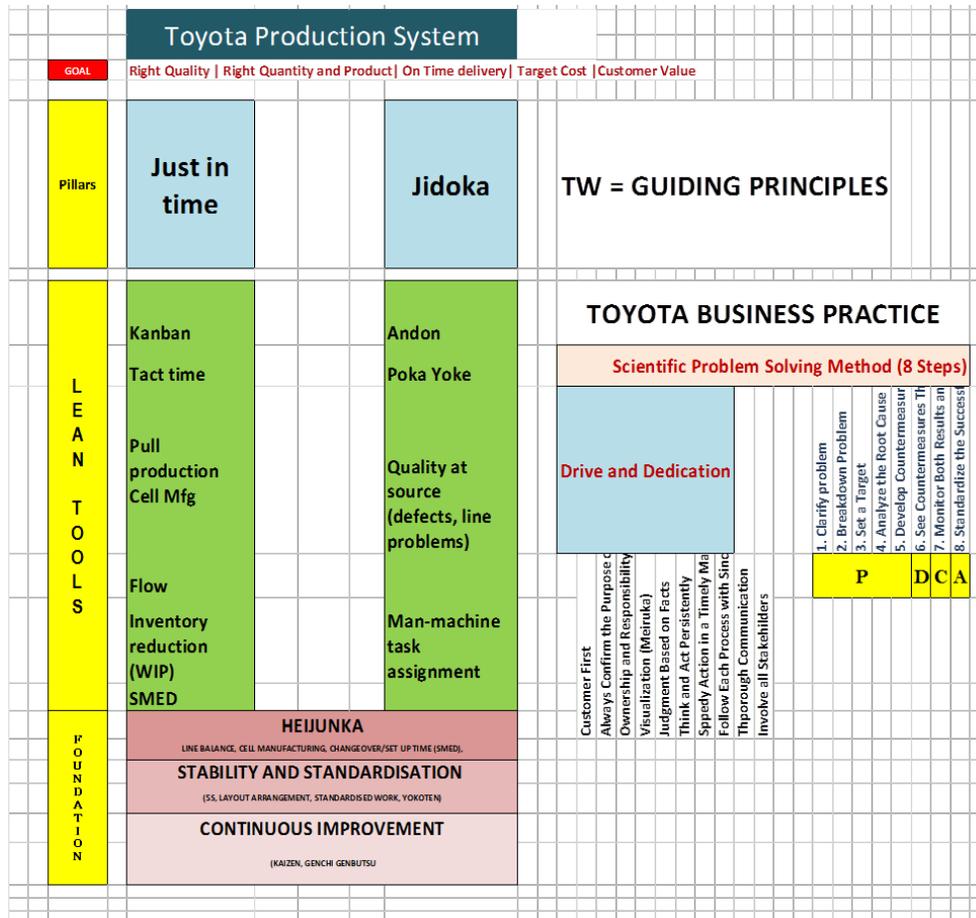


FIGURE 1 TOYOTA PRODUCTION SYSTEM

An interesting study on TPS was made by Spear and Bowen [13] who described the system built in Toyota and their DNA. They suggested that the DNA of TPS has 3 rules of design and 1 rule of improvement. Rule one is how people work which is basically work design and execution. In Toyota, every activity has standard. Not just production but all divisions and units. Hino [14] also reported the countless Toyota management system standards and procedures developed since its inception. Work is highly specified in term of contents, sequence, timing and outcome particularly on the production shops. Operators follow well defined sequence and steps. Spear and Brown [13] also suggested that requiring people to do work in highly sequence standards steps is to test two hypotheses. First is to test whether they can do the job, are they capable of doing it correctly, and second test is whether the activity creates the expected outcome. The second rule relates to how people connect to each other. Every connection must be standardized and direct unambiguously specifying the people involved, the form and quantity of goods and services to be provided, and also the expected time in which requests will be met. Basically, the interphases between processes and activities must be well defined in term of input requirements and output expectations from all aspects including quality and process efficiencies. Supplier's connections must be direct, simple, unambiguous and easily understood. The third rule is on how the production line is constructed. All production lines in Toyota are set up so that every product and service flows along specified path (smooth flow). Goods (and services) not just flow to the 'next available' machine or person but flow to the specified machine, correct process or person. If it is not available this is seen as a problem and need to be solved. The last rule relates to how to improve. Identifying problems is just first step to make effective changes. Employees must know how to change or improve and who is responsible for making the changes. Toyota explicitly teaches employees how to improve. Rule number four states that 'any improvement to production activities, to connections between workers and machines, or to pathways must be in accordance with scientific method, under guidance of a teacher and at the lowest possible organizational level. Who does the improvement? Frontline workers make improvements to their own jobs. When changes are made on a larger or at a higher level, Toyota ensures that the improvement teams created consist of people who are directly affected and the person responsible for supervising the pathways involved. It is nature of problems that determines who should solve them and how the organization is designed. It is vital that these rules are understood. Through understanding them then one can see how well structured and organized TPS is and without doubt will ensure its long term continuity and sustenance. All these rules are embodied in the Toyota Way Booklet [15] and the Toyota Business Practice [16].

II. SUSTAINABILITY FACTORS FROM THE LITERATURE

Very few researches have focused on issues relating to sustainability of lean. The chances of failing during lean or TPS implementation is very high. Zarbo [17] quoted Liker’s opinion that 90% of those who attempt lean fail. He argued that success in lean is derived from the culture of Toyota, founded by their founders and the management principles of Deming. This section will present on the work of researchers who have investigated these and to try and analyze them here.

Hines, Holweg and Rich [18] presented a thorough review of contemporary lean thinking. They opined that implementation (of lean) was entirely tool-focused, and generally neglected the human aspects of the high performance work system core to the lean manufacturing approach. Not focusing on human aspects will be detrimental to the success of lean and subsequently its sustainability. Another important aspect which was highlighted by them was setting a vision to becoming lean (i.e. creating lean thinking) through organizational learning framework. They argued that the human dimensions of motivation, empowerment, and respect for people are key to the long term sustainability of any lean programme. Another element is the lack of strategic level thinking in lean programmes. Practices that have been embedded in a lean production also present an attractive set of characteristics that can be considered for sustainability. It is especially so when it relates to human dimensions as pointed out earlier. Olivella, Cuatrecasas and Gavilan [19] discovered work organization practices for lean production encompassing six main elements with detail sub-elements. They derived these through literature as well as experts interview. A summary of the elements are given in Table I.

TABLE I. ELEMENTS OF LEAN ORGANIZATIONAL PRACTICES [19]

| Factors | Elements | Detailed description |
|---|----------------------------------|---|
| Standardization, discipline and control | Formalization of procedures | Document and standardize production processes For each task define the content, sequence, terms and expected results |
| | Discipline | Scrupulous accomplishment of norms and planning Undisputed authority of leaders |
| | Control | One team member leads the team and strictly controls work A leader who is not a team member controls and supervises several teams |
| Continuing training and learning | Recruitment criteria | Vocational or technical training required for recruitment as a line worker When workers, supervisors or specialised workers are recruited , willingness to learn new skills is highly valued |
| | Training | Emphasis on training of new training of new and existing workers, supervisors and specialised workers Inclusion of training in interpersonal skills |
| | Quality control and LP knowledge | Workers, supervisors and specialized workers have quality control knowledge Workers, supervisors and specialized workers have LP knowledge and a general vision of the process |
| | Learning by solving problems | Use of formal problem-solving process |
| Team-based organization | Work teams | Shop floor workers participate in work teams |
| | Teamwork support | Supervisors encourage workers to cooperate with each other |

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|--------------------------------|--|--|
| | | <p>Activities are organized to improve team cohesion</p> <p>Common work space for team members</p> <p>Personalized team spaces</p> <p>When workers, supervisors or specialized workers are recruited, interpersonal skills are highly valued</p> |
| Participation and empowerment | Participation in day to day operations | <p>Work teams are assigned, quality control, maintenance, work planning and safety responsibilities</p> <p>A high percentage of workers participate in quality control, maintenance, work planning and safety</p> <p>Work teams receive detailed information about quality, performance, and accidents</p> |
| | Participation in improvements | <p>System for workers suggestions, whereby suggestions are applied</p> <p>Existence of improvement groups that includes workers</p> |
| | Flatter organization | <p>Few levels of management</p> <p>Teams self-coordinate with suppliers and internal clients</p> <p>Existence of communication between managers, specialized and non-specialized workers</p> <p>Workers participate in conflict resolution meetings</p> |
| | Empowerment | <p>Extended functions</p> <p>Operational autonomy</p> |
| Multiskilling and adaptability | Multiskilling | <p>The more skilled workers are able to do a high number of task</p> <p>Workers have a minimum numbers of tasks they are able to do</p> <p>Visual information on the multiskilling of work-team members</p> <p>Frequent task changes</p> |
| | Adaptability | <p>When workers, supervisors or specialized workers are recruited, acceptance of authority (discipline) is highly valued</p> <p>Mechanisms to match the current number of employees to production needs</p> |
| | Job classification | <p>Priorities flexibility in job descriptions</p> <p>Minimum number of job classifications</p> |
| Common values | Commitment | <p>Management demonstrates visible commitment</p> <p>Workers are given information on the overall situation and prospects of the company</p> <p>Activities are organized to inform workers on the different aspects of the company's activity</p> |
| | Absence of barriers | <p>Same uniform (e.g. no ties for</p> |

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| | between managers and workers | management), cafeteria, car park |
| | Quality of work life in the workplace | Programmes to help employees balance work and family life Job enrichment to encourage balance work |
| Compensation and rewards to support LP | Compensation | Compensation based on plant performance Compensation base on team performance Compensation based on workers skills |
| | Rewards | Rewards for applied ideas, both for individual and collective work Visual information on rewards |

Ranky [20] proposed eighteen principles for assembly line design and management principles which are believed to be relevant for sustaining lean. The principles were based on Denso’s monozukuri focused sustainable process and product design. The principles are listed in Table II. He pointed out that the core message of these principles is to design eco-friendly, quality products that customers need, want and desire, produce it exactly as much as needed, just-it-time, to reduce inventory waste and cost throughout the global supply chain. He cautioned that in reality is that despite the fact that these principles sound truly very simple, there are a lot of science, engineering and management hiding between them and often misunderstood and ignored by management, as well as the academic research community. Implementation is the hardest part because it needs the acceptance and harmony of everyone. He used the term ‘quality culture’ as missing in many organizations implementing thus making it difficult to sustain.

TABLE II. PRINCIPLES SELECTED FOR SUSTAINING LEAN : SOURCE:[20]

| Description of Principles |
|--|
| Management principles should reflect long term thinking , even if this means initially hard-to-accept financial returns |
| Develop outstanding leaders who fully understand and support the company philosophy, and wisdom |
| Create a strong company culture that does not tolerate poor quality work and focuses on continuous improvement and waste reduction methods and tools |
| Good leaders will spend time at all levels of the company to thoroughly understand all aspects of a decision (genchi genbutsu) |
| Your company supply network plays a key part in designing products, processes and systems, therefore help them to continuously improve |
| Decisions should be achieved by means of team consensus |
| Balancing the workload is essential to avoid high WIP (work-in-progress) and buffer size fluctuations (heijunka) |
| The production control system should always focus on producing based on the market’s needs, not the factory’s maximum capacity |
| Technology used should be the appropriate, tested level of technology versus the latest, for the sake of using the latest technology |
| Design continuous improvement techniques, or Kaizen methods into every process |
| Design products and processes in the digital domain first, to avoid MUDA,MURA, and MURI |

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| Visual factory |
| Strive towards the wisdom of a learning organization through analysis and reflection (hansei) and continuous improvement (kaizen) |

III. EXPLORATORY STUDY ON SUSTAINABILITY FACTORS

Having described the various aspects and concepts of lean or TPS, and sustainability elements of lean, it is now important to obtain some ideas and perceptions from practitioners and experts. A very important question after the implementation and construction of the lean system relates to how to sustain that system and determining the lean sustaining factors or lean excellence factors becomes a necessity. Therefore, the burning question is how organizations can sustain their lean or TPS initiative. What are the sustaining factors? To initiate the process of identifying those factors, one of the authors spent two months in April and May of 2015 in Japan interviewing and visiting selected experts to find out what they believe are the ingredients for success in sustaining or excelling further TPS or lean system. It is strongly believed that since TPS was born in Japan then it will be much more appropriate to obtain information from the people who have direct experience about it. The experts were selected based on personal contacts by the authors from those who are experienced in TPS as well as willing to share their knowledge. The experts interviewed are listed in Table III with their brief background.

TABLE III. EXPERTS INTERVIEWED

| Expert | Current or Former Job | Experience |
|--|----------------------------------|--|
| Yanagida T.(more than 30 years experience in industry) | Consultant | Studied TPS from Ohno’s student, 30 years working in Fujitsu. Now Full time consultant for 11 companies on TPS |
| Muraoka T. (age 65 over 30 years in Toyota) | Consultant | 35 years in Toyota. Now Advisor for Lean Programme in one of Chinese Die Casting Company |
| Tanaka K. (age 54 over 30 years with Toyota) | General Manager TQM | TMC Nagoya, 30 years’ experience with Toyota from shop floor to engineer to manager |
| Hamaguchi M. (age 50 over 25 years with Toyota) | Ex- Toyota GM (Overseas Plant) | Consultant with previous experience in building TPS in Indonesia |
| Kitahara H. (age 56 over 30 years with Denso) | Former Vice President Denso (NA) | Director of Denso and have been involved in implementing monozukuri and TPS in North America plant |

The interviews were conducted based on the convenience of these busy people at their place of choice. It did not follow any strict set of questions. However, the fundamental question posed to all of them was on what they believe to be the factors that were able to sustain and continue flourish in Toyota Production System. Some of the questions asked were:

1. How did Toyota start implementing TPS?
2. Why did Toyota implement TPS?
3. What are the key factors that made TPS last until today in Toyota?
4. What are the under current or DNA for TPS success?

From the answers given, further probing was made to detailed reasons and understanding. In a way it is similar to applying the 5 Why methodology. One of the authors is native Japanese, while the other has some basic command of Japanese, the answers and description given could be easily understood. Some difficult concepts were simultaneously translated by the Japanese

author. It must be noted here that all the experts mainly answered in Japanese and very few English sentences emerged during the interview sessions. It is believed that only through Japanese experts that one can probe into TPS success.

From the interviews, many fresh perspectives were obtained or gained regarding the reasons for TPS, the ingredients that make TPS sustainable and continuously being enhanced and improved. TPS is not static but dynamic and continue to be changing in Toyota and its related companies similar to its new car models.

Fundamental to the system is the question of why implement TPS? Why JIT? Most of the interviewees, gave the reasons for adopting JIT (only produce necessary item, produce it only when it is required and where it is required) was the inability to buy raw material because of *okane sukunai* (little money) during early stages of Toyota and its financial crisis. At that time, Toyota was not able to buy a lot of material due to financial problems, and thus, cannot effort to produce large batch production. They resorted to buying small quantity of material and just in time since the time to purchase is shortened and the amount is also sufficient for lesser time. In that crisis condition or problem based context, employees are required to be able to think as to how to achieve this (*okane sukunai* condition) and overcome the problems. Reduce inventories, faster flow, value adding activities, all require improvements. This resulted in continuing search by employees for quality and process improvement. Kaizen can be done for new tools and concepts. The concept of kanban was introduced to control supply and delivery of materials, which is followed by other ideas and tools such as SMED – single minute exchange of die – or set up time reduction. The problem was too long a time waiting to set up process such as stamping, painting or die casting. They need a much faster and cheaper way to achieve this. Using the five whys questioning method, problems found must be solved and not delay process. Quality must be built in the process and Jidoka is a way to achieve this. Therefore, all these are the actual progress and ‘challenges’ which can be said to be ‘forced’ on the company to survive. However, this spirit continued to be nurtured and were accepted as greater challenges faced and they continue to invent and evolve new tools and approaches such as quick changeover, Karakuri, and meiruka. This is the ‘undercurrent’ in Toyota as what one of the experts said to only exist in TPS. This undercurrent is the human spirit and human resources development. Hitozukuri (making people) as opposed to monozukuri (making products) is the key to sustaining TPS. The system must also be supported by an excellent sub-system that builds and create employees who are knowledgeable, with the Toyota attitude and superior skills. These knowledge, skills and attitude will be continuously challenged differently at various levels from shop floor employee, line leader, assistant manager, managers, general managers, project managers, directors, and beyond. It is found that the key sustainable factors are related to human resource excellence within the organization that supports TPS success. The proposed list of factors discovered from the interview sessions with the Toyota experts and combined from the literature in Table I and II, they have been consolidated and summarized in Table IV. It reflects the formula for success and sustaining the lean journey.

Human development through structured training and education system are also evidenced in a TPS environment. Toyota has a well-structured, systematic employee and career enhancement system. True improvement (continuous Kaizen) can only be done through understanding the Toyota problem solving approach using sufficient knowledge and skills. The knowledge is enhanced throughout the different level of employment as and when required.

TABLE IV. SUSTAINED LEAN FACTORS

| Factor | Elements |
|------------------------|--|
| Leadership | Management principles should reflect long term thinking , even if this means initially hard-to-accept financial returns |
| | Develop outstanding leaders who fully understand and support the company philosophy, and wisdom |
| | Create a strong company culture that does not tolerate poor quality work and focuses on continuous improvement and waste reduction methods and tools |
| | Leaders who support their subordinates at all levels |
| Standard Work Practice | Understand and apply the structured 8 Steps Problem solving method |
| | Job knowledge (such as Design) updated and challenged |
| | Leaders spend time at all levels of the company to thoroughly understand all aspects of a decision through genchi genbutsu practice |
| | Suppliers involved in designing products, processes and systems, and need |

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|----------------------|---|
| | assistance to continuously improve |
| | The production control system should always focus on producing based on the market's needs, not the factory's maximum capacity |
| | Design continuous improvement techniques, or Kaizen methods into every process |
| Values | Attitude in challenging current method |
| | Team decision making culture |
| | Willing to try new ideas through elimination of muri, muda, mura |
| | The spirit of 'can do' and 'challenge' as a way of life |
| | Strive towards the wisdom of a learning organization through analysis and reflection (hansei) and continuous improvement (kaizen) |
| Knowledge and Skills | Always learning new psychomotor skills at higher levels |
| | Thinking skills always enhance through problem solving |
| | Leader skills at all levels nurtured and mentored (sempai-kohai) through training / coaching |
| | Striving to learn new things and practically use the knowledge gained |
| | Developing and using appropriate tested technology not just for the sake of using the latest technology require knowledge |

IV. CONCLUSIONS AND FUTURE WORK

The ultimate condition for which TPS or lean is already sustained or cultured is characterized when all activities have the elements of the Toyota Way. Sustained here means the practices of costs elimination through waste reduction being the way of life. Kaizen is in the blood of the managers and operators. Everyone talks the language of meiruka, A3 report, Yokoten, Kanban, and all lean principles and practices including relevant tools and techniques. In short, lean is in the thinking and action of every employee at whatever level of adoption an organization is in.

The sustainability of any system will occur when everyone, including managers and operators have acquired the knowledge, skills to continuously perform tasks according to the belief system, principles and vision of the company. The four factors identified; leadership, standard work practice, values and knowledge and skills are believed to be critical for sustaining lean. These sustained factors will hinge on respect for people including:

1. Trust and empowerment
2. Continual challenge and reward
3. Continual knowledge increment for acquiring new technologies to support –zero inventory, perfect quality, zero downtime, and other challenges in the form of existing and new problems (challenges)
4. Culture for participation, listening, engagement, and people
5. Challenging current levels of efficiency and productivity levels toward becoming a slim and smooth organization

It is a condition described by stability but wanting to move forward. Management provide new targets and goals and accepted with good faith by employees. In addition, the system is entrenched with costs reduction ideas from employees thirsting for waste elimination. So, how can all these be further studied and captured. That is the challenge for non-Toyota companies. Especially, small companies where there need to be lean as they lack human resources, financial strength and

management expertise. A much simpler lean sustained approach could probably be formulated for small and medium sized company without sacrificing the essence of lean or TPS at the same time.

It is proposed that these factors that characterized sustainable lean companies be called the Sustained TPS State (STS). As every industry operates differently, studies focusing on some common theme or factors contributing to sustainable lean implementation are expected in the future. This study has adopted the exploratory study to determine factors which will be further tested through confirmatory factor analysis. Future research will focus on conducting a survey as well as case studies to prove the ideas and challenges formulated in this paper.

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BIOGRAPHY

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Katsuki Aoki is an Associate Professor at the School of Business Administration and specializes in business administration theory. He graduated from the School of Business Administration, Meiji University in 1993, Master in Business Administration in the Graduate School of Business Administration, Meiji University (MBA) in 1995, and Doctorate from Graduate School of Business Administration, Meiji University (PhD) in 1999. He has lectured in the Department of Business Administration, Faculty of Economics, Kanto Gakuin University from 1999 to 2002. He was visiting scholar, Judge Business School, University of Cambridge in 2006. Visiting Scholar, Cardiff Business School, Cardiff University in 2007. Became Associate Professor in the School of Business Administration, Meiji University in 2011. He is a member of Academy of Management, academy of International Business and European Operations Management Society.