

# LEAN PRODUCTION AND LEADERSHIP OPERATIONAL EXCELLENCE IN JAPAN



Pars pro toto –  
The Toyota Production System as Part of an  
Integrated Model of Corporate Management

Roman Ditzer  
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## Article for Background Reading

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# Pars pro toto – The Toyota Production System as Part of an Integrated Model of Corporate Management

Roman Ditzer, 2012



'MAP OF 6 ZERO-ACTIVITIES' – STATUS-VISUALISATION AT KSK 2013

In the midst of a worldwide boom, the Toyota Production System (TPS) has long since transcended the confines of the automotive industry as a blueprint for how to organise value-added processes. TPS used to be thought of as simply a concept and an instrument for designing and improving production processes. However, the focus on production is not sufficient in itself to explain Toyota's success in manufacturing excellence and making continuous improvements. Rather, one should examine the close relationship between the production concept and various other factors and practices, which goes beyond the strict definition of a production system. In this article, TPS finds its place in a production-wide system of corporate management. Besides the production system, this 'Toyota Corporate System' consists of three further elements: 'Change Management', 'Incentive Management' and the 'Corporate Culture of Improvement'.

In 2004, Toyota surpassed Ford to move up to second place on the list of the world's largest car manufacturers. In 2008, Toyota produced more cars than General Motors (GM) for the very first time, thus becoming the world's largest car manufacturer. (OICA 2009)

While these and many other indicators reflect the economic success of the company, Toyota also enjoys a good reputation thanks to corporate behaviour that some may consider altruistic. (Ditzer 2005)

One example of this is the 2006 Fortune rating, where Toyota was ranked second in the category of 'Global Most Admired Companies'. And Toyota also recorded the highest profit of the 200 listed companies (Clark 2006). "As the example of Toyota makes abundantly clear, ethics is not a barrier to the pursuit of profit and strong earnings. Ethics and profits are not mutually exclusive; on the contrary, one is a prerequisite for the other." (Becker 2006, p 412)

Success across the board: When the Handelsblatt (a German business-newspaper) reported yet another record profit for Toyota in 2004, it confirmed that the company's goal of becoming the world's number 1 automobile manufacturer by 2010 was on track. They concluded by saying: "Toyota is the absolute role model for entrepreneurial success". (Menzel 2004)

This rating marked the zenith of Toyota's general standing. The recognition and admiration of the practices and the related successes raised further questions: Does Toyota's approach represent an

alternative model for corporate management among Western car manufacturers? And can it be seen as a viable alternative model to Anglo-Saxon-style capitalism?



ANALOGUE PRODUCTION MANAGEMENT – KANBAN RAILS AT KYB 2002

## Where is Toyota Today?

The world has changed significantly since the financial and economic crisis that began with the 'Lehman shock' in September 2008. Initially, sales and profits collapsed for almost all car manufacturers worldwide. Since then, however, Toyota's heyday seems to have come to an irreversible halt. After the economic upturn, Toyota was hit particularly hard by a number of other events and factors.

Around the time of the economic downturn there were a number of fatal accidents involving Toyota vehicles in the USA, fuelling doubts about the quality of Toyota's products – something that had always previously been an integral part of the brand image. Indeed, major recalls initially seemed to confirm that the product was defective. And although large-scale investigations failed to prove Toyota's culpability, it nevertheless had an impact on the company's reputation: In the 2012 Forbes ranking of 'World's Most Admired Companies', Toyota dropped to 33<sup>rd</sup> place. In the automotive industry, Toyota now ranks behind the German manufacturers Volkswagen, BMW and Daimler, albeit still ahead of its other competitors.

In 2011, two natural disasters compounded the situation: earthquakes and tsunamis devastated an entire region in north-eastern Japan and severely exposed Japanese car manufacturers' dependence on individual plants in the supply chain, which

ultimately lead to production downtime. Thailand, the base for Japanese vehicle production in Southeast Asia, was hit by widespread flooding, which led to downtimes sometimes lasting several weeks and resulted in production stoppages and a sharp drop in sales and profits.

All in all, Toyota has sustained a triple blow in the past five years – financial crisis, image crisis, and natural disasters. To make matters worse, it has also been hard hit by exchange rate trends: The external value of the yen against the US dollar and the euro has risen by around 35% since early 2007. The Japanese talk of an 'ultra-strong yen', but this is no cause for celebration among Japan's exporters, as it equates to a loss of competitiveness. 40% of Toyota's total output is produced in Japan, with exports accounting for over 50%, which in turn has a strong impact on earnings. (Toyota 2012)

So it is hardly surprising that, in terms of profits and return on sales, Toyota is no longer the outstanding success story that it once was: In the past, Toyota's margins of over 8% outperformed even the German premium manufacturers, but the relationship is now reversed. (Freitag 2008, Ernst & Young-1 2012, Ernst & Young-2 2012)

However, this did not only happen as a result of external factors: The annual Harbour Reports, which benchmarks the productivity of automobile manufacturers, shows that competitors have been doing their homework. The study measures productivity in terms of hours per vehicle (hvp), and developments here indicate that the gap has narrowed. "There is no doubt [...] that continuous improvements in manufacturing processes are taking hold in just about every company. [...] Everyone is focused on reducing waste and building quality into their processes more than ever", stated the authors when comparing the North American plants of various automobile manufacturers in 2008. This shows that the worldwide boom in lean production (i. e. the Toyota production system) is now also reflected in the performance indicators of the competitors: the gap to the other manufacturers has largely been closed. (Oliver Wyman 2008)

In the five years since the onset of the financial and economic crisis, it has become clear that Toyota is

not insulated from the boom and bust of the economy, and nor is it immune to natural disasters. Furthermore, it seems that its traditional strength of remaining profitable even in difficult times is a thing of the past. Compared to its former glory, Toyota's star now has only a faint shimmer. (*Wirtschaftswoche* 5.3.2012)

Does this mean that the concept of Toyota is obsolete?

It is indeed unclear to what extent Toyota will be able to recreate its glory days. This is because the Japanese automotive industry is currently undergoing a far-reaching restructuring process, involving the relocation of yet more production capacity to the target markets, and the creation of new global production networks. The demographic development in Japan does not constitute a home advantage. The transition to next-generation drive technologies requires enormous efforts. In light of the rapid ascent of South Korean electronics and automobile manufacturers, there is already talk in some quarters that the Samsung Hyundai model is the new management success formula.

That said, observers have been impressed by the rapid restoration of supply chains and the production restart in 2011 following the natural disasters in Japan and Thailand. Toyota stood out among Japanese manufacturers in 2012 with the strongest growth in sales and profits, having regained its position as the world's largest automobile manufacturer.<sup>1</sup>



'PLAYFULLY SERIOUS' – SANDWICH TRAINING AT KSK  
(PHOTO: STEFAN GRUNER)



'PLAYFULLY SERIOUS' – SANDWICH TRAINING AT KSK

What else stands out? The global success of lean production continues apace. The decline in the company's key figures has not yet been used to proclaim the end of the Toyota production system. On the contrary, the increasing spread and mastery of this methodology is one of the reasons why Toyota has lost some of its exceptional status. Nevertheless, in terms of lean processes and improvement activities, the aforementioned Harbour Report 2008 still concluded that: "Toyota remains the industry benchmark [...]" (Oliver Wyman 2008).

<sup>1</sup> The former relationship was restored at the beginning of 2014. Here are a few remarks: In 2013 Toyota became the first car manufacturer in the world to produce more than 10 million cars in a single year. Toyota has regained second place in the Fortune list of the 'World's Most Admired Companies' in its industry, and is also in first place in the Interbrand list of 'Best Global Green Brands' (Fortune 2014, Interbrand 2013). The company expected record profits for the financial year 2013/2014. The profit is expected to

exceed the previous record from the 2007 financial year, prior to the outbreak of the global financial crisis. This made headlines at the time as the highest profit ever posted by a Japanese company. And in terms of profitability, Toyota is back at the top of the list, and well positioned with an EBIT margin of 10.7% for the first nine months of 2013. (Ernst & Young-3 2013) So it's business as usual? At the very least, Toyota has made an impressive comeback – but the next upheavals are surely on their way.



PARTICIPANTS AT WORK – SANDWICH TRAINING AT KSK 2012 (PHOTO: STEFAN GRUNER)

Whoever wants to work with lean methodology is, therefore, well advised to continue studying Toyota. And there is certainly no shortage of questions that arise from the practical application of TPS. Most importantly, what are the features 'around the production system', i. e. beyond the concept of process design, that are responsible for the continuous improvement effect. The following section classifies the TPS into a production-wide system of corporate management and also clarifies the meaning of key terms.

### What is Toyota?

There have been many attempts to describe what makes Toyota so special. The Toyota Production System together, along with its concept and instruments, has been extensively documented since the 1980s. In recent years, the focus has been on management principles, corporate culture and, very currently, management style. (cf. Sackmann 2005, Liker 2004, Liker / Meier 2006, Becker 2006, Liker / Convis 2012)

As a company, Toyota was strongly influenced by the personages involved in its early years, and their influence continues today. This applies equally to the central concepts of quality assurance (*jidoka*) or just-in-time production in the TPS, but also to fundamental and consistent processes within the company. Alongside the research results, three additional aspects should be mentioned here, which can be summarized as follows:

### Both Feet on the Ground – the Added Values and the Facts

The company history of Toyota begins with strong process orientation and continuous improvement. Sakichi Toyoda was an inventor and innovator who, in a series of improvement cycles, gradually perfected his mother's loom to the point where it could be used for industrial-scale production. With the proceeds of selling the license for his technology to the English loom manufacturer Platt Brothers in the 1920s, his son, Kiichiro Toyoda, was able to finance the development of their own automobile production. Consequently, the company is deeply rooted in the aspiration to continually optimise the production process. There has been much written about the distinctive process awareness and in-depth process knowledge among the managers at Toyota (cf. Spear 2004). By viewing the process as something akin to the bedrock of the value chain (and the factual basis), one can see that Toyota's employees are very much 'grounded'. *Genchi genbutsu* (Toyota translation: 'Going to the source' in the sense of: 'Go to the heart of the action and see for yourself!') is more than just a method of improving processes; above all, it is a call to maintain this grounding in the midst of growing mechanization and computerised control, and therefore it is an expression of how management is rooted in the production process. (Toyota 2006b)

## A Spirited Shot at the Stars

Toyota's company history was shaped by the strategic vision of its management. One early example of this is Sakichi Toyoda's instruction to his son to set up his own automobile production. (Liker 2004) The goal set by Kiichiro Toyoda in 1945 was to reach the level and profitability of American automobile production within three years. Considering the conditions in post-war Japan and the technological dominance of American producers, this objective was rather audacious (in reality it took until the 1960s). More recent examples are the targets that Toyota set for itself in 1995 as part of its Global Vision 2005, and the follow-up Global Vision 2010, namely to become the world's largest car manufacturer by 2010, thereby ousting Ford and General Motors from 1<sup>st</sup> and 2<sup>nd</sup> place. Time and again, Toyota seems to reach for the stars, and the visionary courage of its leadership has been consistently borne out.

## With firm Belief and Trust – in *Kaizen* and in the Potential of their own Employees

There seem to be two core tenets at Toyota: one is the belief that things can always get that little bit better. This is expressed, for example, in such slogans as 'Kaizen never ends' (*kaizen ni kiri ga nai*)<sup>2</sup>. This fundamental principle is coupled with the belief that the company's own employees also have the potential to develop and implement this idea of always getting better.

The visionary courage of Toyota's management is directly related to the confidence they have in the potential of their employees. These employees are called upon to face challenges and find innovative solutions to new problems. For instance, when planning the capacity of new production lines at a level of plant availability not yet reached. Another example of this is how the hybrid drive was developed in the extremely short time frame of just four years from kick-off in September 1993 to market launch in October 1997. (Liker 2004)



"I USED TO BE AN ABACUS, NOW I'M A ROLLER CONVEYOR" – PRAGMATIC REPURPOSING AT KSK 2013

The company's belief in the good in people was also reflected when Toyota took over the management of NUMMI in 1984 to produce compact cars in California as part of a joint venture with General Motors. NUMMI (New United Motor Manufacturing, Inc.) was in fact a former General Motors plant; in terms of quality, work ethic, etc., it was the worst. It was so bad that General Motors themselves had abandoned the site in 1982. Toyota took over the plant with the old workforce and within a short period of time had managed to solve many of the long-term problems, such as substandard quality and staff absenteeism. After one year, the plant was outperforming all others at General Motors. (Shook 2010)<sup>3</sup>

*Ningensei soncho*, meaning 'respect for human nature', is the term used to describe this belief in the abilities of staff to step up when they are challenged and encouraged. This also describes one of the two areas where Toyota has divided its Toyota Way. It is explained as follows: "Respect for people is the

<sup>2</sup> The current Toyota CEO's own description: "[...] we at Toyota are people 'who believe there is always a better way'. Every kaizen improvement is the beginning of other kaizen improvements. Kaizen is an unending process. All of us at Toyota share a commitment to that fundamental principle of the Toyota Way." (Toyota 2011)

<sup>3</sup> In 2010 the NUMMI plant was closed; the first Toyota production facility in the USA began in 1984 as a joint venture with General Motors and operated for 26 years.

attitude that most highly regards people's ability to think." (Toyota 2002) <sup>4</sup>

If Toyota were compared to a human being, it would be a very conservative person, with unwavering basic principles or strong religious belief. In terms of professional training and ethics, this person would be a craftsman with high standards for their own work and that of their colleagues and staff. Through years of professional practice they would have mastered their craft and, as thoughtful teachers, would pass on their knowledge to the next generation. To that can be added entrepreneurial foresight and business acumen, nicely rounding off the personality profile of the fictitious 'Mr Toyota'.

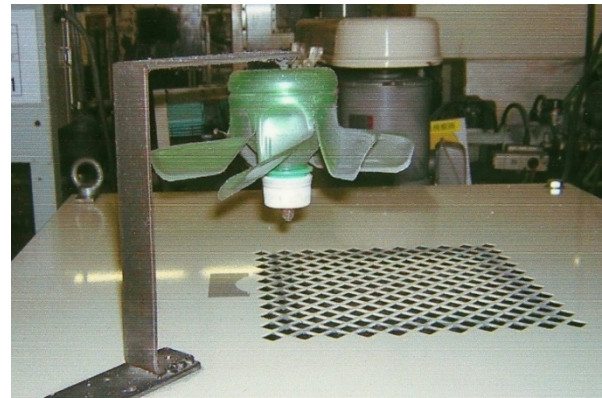
### What is the Toyota Production System?

In the narrow sense, TPS is primarily a concept for production design. Its components *jidoka* and just-in-time serve as an alarm function for problems or deviations from the target condition. Their purpose includes detecting problems and initiating countermeasures. In this sense, TPS is a system for improving production.

In recent years, the focus in publications has shifted from the technical side of production management to soft factors, such as corporate culture and leadership. Today, it is clear that Toyota's performance in manufacturing and continuous process improvement requires more than merely the production system. There is no doubt that TPS is an evolutionary system that has developed over the course of the company's history, based on a number of key principles that were established at an early stage with the help of

charismatic leaders. (Fujimoto 1999) The following are examples of Toyota-specific characteristics:

- a distinctive behaviour exhibited by those involved in the improvement activities, characterised as a 'scientific approach' (Bowen / Spear 1999),
- a special way of working with suppliers, characterized as 'tough love'. (Choi / Liker 2005),
- a unique approach to product development and the production preparation (Liker, Sobek and Ward 1998),
- a distinctive approach to developing the next generation of leaders (Liker / Convis 2012).



"I USED TO BE A WATER BOTTLE" – REPURPOSING AT KSK 2004

These findings indicate a variety of factors and practices closely linked to the Toyota production system, extending beyond what is normally understood by the term production system. The search for a conceptual bracket for TPS and all that goes with it only ends at the highest level of aggregation and ultimately leads to a system for managing an entire company.

<sup>4</sup> This philosophy is also expressed in company slogans such as "Yoi shina, yoi kangae" [Good products, good thoughts] and "Monozukuri wa hitozukuri" (English translation at Toyota: "Developing people first"). (Toyota 2006c)



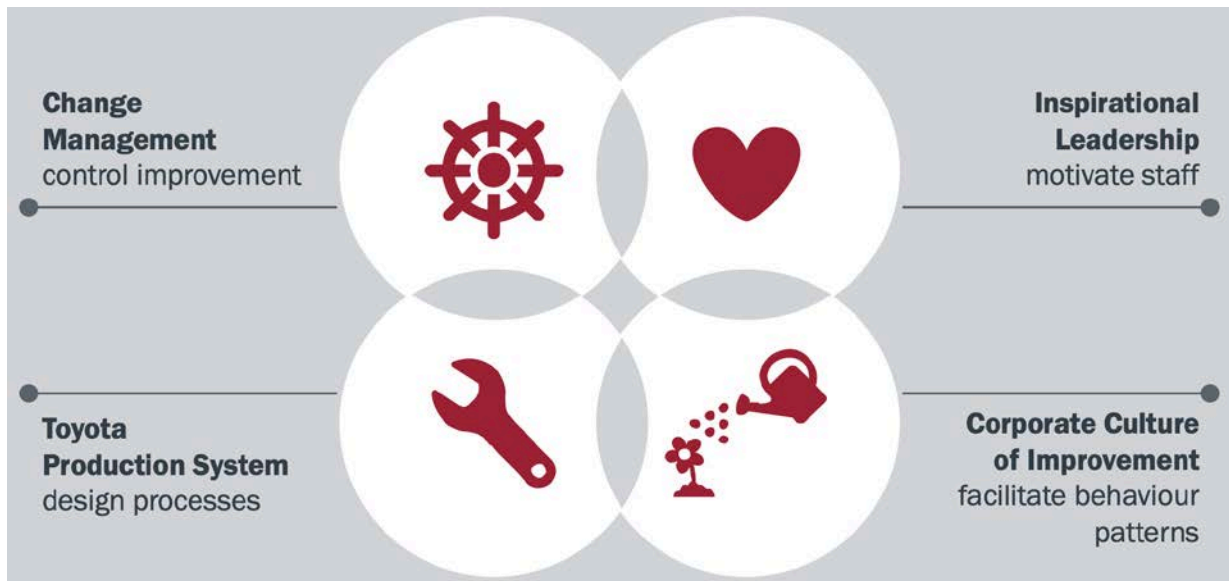


FIGURE 1: TOYOTA'S INTEGRATED IMPROVEMENT SYSTEM; SOURCE: AUTHOR

This Toyota corporate system consists of four parts:

- Toyota Production System – the production concept and the *kaizen* methodology
- 'Change management' – to control and perpetuate the improvement process
- 'Inspirational leadership' – to integrate and develop employees
- 'Corporate culture of improvement' – i.e. behaviour of all stakeholders is conducive to further improvement

Cybernetics is the science of functioning. The hypothesis of this article is that Toyota's success – still undisputed in terms of manufacturing excellence and continuous improvement – is based on the interaction of specific features and system elements from very disparate fields. The point here is not to present these four areas in detail. Other authors have already covered these areas separately. Rather, the aim here is to show the interaction between the areas, enabling them to function in a harmonious context; in combination, with each reinforcing the other. It is important to note that managers are challenged in all four areas of this integrated lean system: They create the impetus for optimization, steer the improvement process, teach methods, provide guidance, and exemplify the required behaviour. It is clear from the breakdown that they have diverse and demanding tasks. No wonder then that this is the most important

factor behind Toyota's manufacturing and improvement excellence – and also the greatest leverage for successful lean implementation.

Some of the characteristics of this system, which are presented below, are also to be found in other Japanese companies and also Western companies. What makes Toyota stand out is its ability to combine all these characteristics effectively and efficiently. Separating the production system from this context and examining it separately would lead to misconceptions. Many companies have failed in their attempts to introduce TPS because they have reduced it to just a handful of instruments, without developing the broader framework in which these methods can take effect. In the future, any reference to the Toyota production system should always be made in the context of this integrated system; it is not sufficient to simply focus on the production system.

### 'Change Management' and 'Inspirational Leadership'

The notional separation of management and leadership is difficult, not least because in most cases the managers are also leaders. They are tasked with systematically striving for the ideal state through the concerted use of human abilities – an unconventional and Toyota-inspired definition of management (Rother 2009, p 12). In other words, alongside the operational business, making improvements is the

noblest task for Toyota managers / leaders: to sustain the continuous improvement process and the ongoing evolution of the company. "At Toyota, improving and managing are one and the same." (Rother 2009, p 53) To achieve this you need two things: steering and communication. And these terms enable a distinction to be made between management (steering) and leadership (communication).

Improvement starts with communication. Even in a company like Toyota, it can take a lot of persuasion to convince employees to change. Most people are initially sceptical of change, and may even reject it outright. In order to convince them of the need for change and have them actively participate in the process, you will need to have answers to four valid questions that employees will ask in this context – either voiced or tacitly: Why is change necessary at all? Where will this change lead to? What exactly is supposed to be changed? How is this going to happen?

Four levels can be derived from these four questions:

- the level of necessity (why?)
- the level of vision (where to?)
- the level of objectives (what?)
- the level of methods (how?)

At Toyota one can observe that the management really does operate on these four levels in order to sustain the improvement process and permanent transformation. Central concepts such as *kikikan*, 'intense watchfulness', *arubeki sugata*, the definition of the 'target state', *hoshin kanri*, 'target management', and several others can be usefully assigned to the four levels.

The first two levels (necessity and vision) come under the heading of leadership, which is primarily about winning people over to change through communication. The two lower levels (objectives and methods) apply to the field of management, where the aim is to steer the improvement process by means of a strategy, key figures, and instruments such as shop floor management.



THINKING AHEAD – A TRUCK WITH GULL-WING DOORS  
(FOTO: STEFAN GRUNER, 2012)

### Leadership – *Kikikan*, the 'Intense Watchfulness'

This need to make continuous and increasingly advanced improvements is communicated by Toyota management in a targeted and systematic manner. Senior figures, such as Toyota's CEO Watanabe or predecessors Cho and Okuda, have all taken it upon themselves to communicate the necessity for improvement and change to the Toyota workforce. The Japanese term for this is *kikikan*. The literal English expression is crisis awareness; however, the translation 'intense watchfulness' is more descriptive. It is an attitude that is suspicious of any success, and can sense the storm lurking beyond any apparent calm. This mindset enables production managers to actively search for potential problems before they occur and to take appropriate countermeasures in advance.

For Toyota, this 'intense watchfulness' is continually communicated and engendered, thus providing answers to the question 'why'. This happened, for example, just before the year 2000 and included a forecast for the new millennium and a prognosis for the long term. Global trends such as environmental issues, globalisation and the IT revolution were

expected to bring about major changes in the automobile sector and in the cars themselves. The first decade of the 21st century was set to usher in a paradigm shift that would redefine the car and the automotive industry. According to the conclusion, the only way to survive in an increasingly competitive environment would be through technological leadership and 'overwhelming advantages in terms of products, quality and costs'. The analysis concluded by saying that the issues involved required a fundamental reform of the manufacturing concept; in other words, a major transformation. (Toyota 2002)

This reasoning prompted Toyota's *Kaikaku* reform in the second half of the 1990s, which was subsequently implemented through a wide range of programs, such as *Construction of Cost Competitiveness 21*, an initiative to lower costs.

#### Leadership – *Arubeki Sugata*, the Definition of the Target State

*Arubeki sugata* (literally 'the form as it should be') is another central concept. It holds that the target state should first be defined and described as a tangible vision, before any improvement measures are taken. Although many companies that use the *kaizen* improvement methodology have mastered the tools, they often fail to define the target state in clear and simple terms. The second level – the level of vision – is disregarded; the question of 'where to' is left unanswered. Rather like the Toyota reform, where the need for renewed and intensified efforts to do better was properly justified at the first level, Toyota's measures can likewise be identified at the other three levels. The target state of change – the second level – was described in the aforementioned Global Vision 2005 and its follow-ups Global Vision 2010 and 2020. The specific visionary part of the earlier versions was that Toyota would supplant Ford and General Motors as the world's largest car manufacturers and become the 'leading company' of the 21<sup>st</sup> century. The Global Visions also include tangible figures on how return on sales or market share would develop, both worldwide and for individual regions. This is where the field of Leadership – Communication – transitions to that of Management – Control.



'MANUFACTURING WITH 5 SENSES' – OLFACTORY TRAINING AT KSK 2013

#### Management – *Hoshin Kanri*, the Target Management

At the third level, it is decided in detail 'what' should happen in the course of the change. It is a traditional role of management to define and pursue targets and to ensure that they are achieved. At Toyota, this process involves a cascading level of detail, from the overall corporate objectives down to specific improvement targets at the level of staff groups. *Hoshin kanri* (policy deployment) is the Japanese term for the process of deriving specific improvement targets from the vision or from the general objectives for developing the entire company. The objectives must be specific and measurable. Toyota's target management uses a system of KPIs to describe the objectives. Practices such as shop floor management are used to verify that the objectives are being achieved. This involves visualising facts on the ground (*mieruka*, 'creating transparency') and, if necessary, devising prompt countermeasures.

Similar practices can be found in other Japanese companies, and meanwhile in Western companies, too. Will the targets motivate, or will they have the opposite effect? When setting targets, it is crucial that all stakeholders can realistically assess their improvement potential. As a result of their role in the production system area, Toyota managers have the advantage of intimate process knowledge (grounding) and many years' *kaizen* experience from the practical implementation of TPS.



5S APPLIES EVERYWHERE – DESIGNATED SPACE FOR TOILET SLIPPERS AT AVEX 2016

## Management – Strategies and Methods

Finally, the question of 'how' is answered at the fourth level. As part of the aforementioned Toyota reform, this was achieved through a variety of programs to shorten development time (Advanced Development 21), to reduce the cost of outsourced parts (Construction of Cost Competitiveness 21), to develop environmentally friendly technologies (Eco), and other measures.

For improving production processes, the *kaizen* toolbox contains the necessary instruments (*kanban*, *pokayoke*, *andon*, etc.). Answers to the question of 'how' to improve the *kaizen* process are provided by TPS training and by the guidance and mentoring of managers for improvement activities. (Bowen and Spears 1999)

It is evident in both the macro domain of company-wide Toyota reform and the micro domain of *kaizen* process improvement that the Toyota management actively works on all four levels and provides answers to the four questions: Why, Where to, What and How.

The consistency and continuity across all four levels is what sets Toyota apart, warranting talk of a genuine management and leadership concept for improvement. This is in contrast to many other companies, which have individual elements, but fail to combine and coordinate them.

### 'Inspirational Leadership' – Involving and Deploying your Workforce

As outlined above: Whoever can communicate well will not only have employees but also supporters who will collaborate towards a common goal. However, there is more to leadership than mere communication.

As a basic approach to improvement activities, *genchi genbutsu* ('Go to the place of action and see for yourself!') has already been discussed previously. *Genba*-presence also has an important role in terms of motivation, i.e. in combination with leadership:

*"The crucial question is to what extent the shop floor can be encouraged to change its consciousness and accept new challenges. The key requirement for this is surely the human presence of top management on the shop floor."*<sup>5</sup>

This reflects the importance of certain behaviours (corporate culture) when it comes to leadership and change.

After reaching a certain level of process improvement, a company can no longer rely on simply reacting to deviations from the standard or from the expected performance indicators. Foresighted leaders actively encourage their employees to flag any shortcomings – be they latent problems, worries

<sup>5</sup> This quote is not taken from a Toyota employee but rather from an interview with Fujio Mitarai, President and CEO of Canon, who drew this conclusion in 2004 from the period when TPS and cell production was introduced at

Canon (Nikkei Business 4.12.2004, p 34). The same applies to the recruitment of Toyota executives.

or anything else – before they become a problem. And this is only possible if you approach your staff in a manner which engages and involves them.

The close relationship between the *genba*, the 'place of action' and the on-site workforce is also crucial in another respect: Toyota managers are teachers and coaches who instruct and guide staff in problem-solving techniques and how to apply them. They also observe and identify potential future leaders, accompanying them through their development. This can be accomplished by providing employees with regular opportunities for personal development – and *kaizen* activities are an excellent way of doing this. This 'talent scouting and training' function of the *kaizen* activities illustrates that *kaizen* is not only used for improvement purposes.

The role of Toyota executives as talent scouts, teachers and coaches also accounts for their high degree of *genba* presence, i. e. working with the staff on site.

The approach to employee development is aptly described with the dichotomy 'challenge and support'. At Toyota, this challenge and support is largely based on a coaching approach. This is in keeping with the insight that some things, such as problem-solving and leadership, can only be learned through practice. This is especially true when it comes to developing the next generation of leaders, who are supported by their supervisor in the role of a mentor, who observes, guides, and supports them in their work. Mentors also include TPS trainers or *sensei*, veterans in the field of improvement, who act as internal consultants, passing on their knowledge and preserving TPS and the Toyota Way. This approach allows the workforce to be renewed organically and from within – at least this is the approach at Toyota in Japan (Liker / Convis 2011, chapter 2 Self-Development).

Accordingly, human resource concepts have been in place for decades that promote employee development by means of development paths. Underlying this is a keen awareness of the dependence on employees as the most important resource of all.



STATUS VISUALISATION – SIGNAL LIGHTS FOR MACHINERY AT KSK 2010

This in turn means that the process of challenging and supporting staff also requires adequate resources, especially in terms of time – a factor that is often overlooked in other companies, despite the lip service paid to developing employees.



ANALOGUE PRODUCTION CONTROL – BOX-COMPARTMENTS AT BOSCH 2006

### Corporate Culture of Improvement

In this context, corporate culture is understood as the values, norms, basic assumptions and rules in an organisation that lead to a specific behaviour among its members. In other words, we are talking about the rules of the game and the particular behaviour of individuals.

Toyota's corporate culture expresses itself in its constructive approach to continuous improvement. This behaviour is conducive to improvement, and hence it is referred to here as a corporate culture of improvement.

One example of this constructive behaviour is *genchi genbutsu*, the aforementioned practice-oriented approach to process improvement. Liker and Meier (2006) use the following formulas to outline the typical behaviour patterns in American and Japanese companies when it comes to the problem-solving process.

They characterize the American approach as 'ready, fire, aim'. The behaviour in Japanese companies (Toyota), on the other hand, is described as 'ready, aim, aim, aim, fire'. Employees in American companies have a tendency towards improvement activism;

problem analysis is neglected in the problem-solving process. Japanese companies, by contrast, invest a great deal of time in problem analysis.

One would shoot before taking aim; the other would aim three times before finally pulling the trigger (see also Toyota 2006b).

The behaviour of those involved in the improvement process and in TPS practice significantly influences the outcome – there is a symbiotic relationship between the production system and corporate culture. The reverse is also true: The full potential of continuous improvement can only be achieved when the two elements are combined.

In fact, the corporate culture is considered so crucial for continuous improvement and the company in general that they have their own dedicated activities to teach these constructive behavioural patterns.

The Toyota Way 2001, published internally by the Global Human Resources Department in April 2001 (Toyota 2001), is an attempt to best describe this 'corporate culture of improvement'. However, the approach is not so much to document and train the theory, but rather to impart this culture through



practice. This is one of the reasons that Toyota continues to place great importance on both internal improvement activities, as well as on collaborative improvement initiatives with and among suppliers; the requisite behaviour patterns are established through continuous practice (*kata* at Rother). To that end, Toyota has stepped up training activities and has established Global Production Centers for staff training in Japan, Europe and the USA, as well as a Toyota Institute for training managers (Sackmann 2005).

What all this has shown is that Toyota's practice is not adequately encapsulated by the term Toyota Production System. In order to understand it properly, all four areas and their interrelationships must be covered, i.e. the actual production system, the associated management, the leadership, and the corporate culture. Then we are talking about 'TPS in a broader sense' or an 'integrated lean concept'

Some of the practices described above are commonplace in Japanese manufacturing companies; they reflect what is associated in Japan with the term *monozukuri* (the manufacturing of things). In common parlance, *monozukuri* refers to a specifically Japanese approach to manufacturing objects and serves as a distinguishing feature against international competition; however, the meaning of the term tends to be vague. So even though these characteristics apply beyond Toyota's boundaries, it is at Toyota that one can find them in a very pure form. A further distinguishing feature at Toyota is the TPS with its components (*jidoka*, just-in-time) and instruments (*kanban*, *pokayoke*, *andon* ...). In conjunction with the TPS, these practices are ultimately highly effective at bringing about improvements. In the case of Toyota, this justifies all talk of an improvement system and an integrated model for running a company.

### What is the Meaning of the Toyota Production System?

Since being described as 'Lean Production' in the MIT study "The Machine That Changed the World" and lauded as the world's best production system, the TPS is now firmly established as a universal model for organising value chain processes (Womack / Jones /

Roos 1990). As an early adopter in Germany, the example of Porsche is well documented (Womack / Jones 1997). Other car manufacturers around the world have also incorporated elements of the TPS and its improvement methodology when developing their own production systems. Evidence that the significance of the TPS now extends far beyond the automotive industry can be found in implementation reports, for example:

- in the electronics industry, e.g. Fujitsu, NEC, Sony, Canon (Nikkei Business 13.10.2005),
- in the metal production industry, e.g. the American aluminium group Alcoa (Spear 2004),
- in the service sector, e.g. at the American life insurer Jefferson Pilot Financial (Swank 2003)
- in the healthcare sector, e.g. in North American and German hospitals (Spear 2006),
- in public administration in Japan (*Nihon Keizai Shinbun* 6.3.2004).

Yet the Japanese press has frequently reported on the difficulties of adopting and implementing the TPS (*Nikkei Business* 4.12.2004): Yanmar is a Japanese company that manufactures agricultural machinery. It converted its production system to the TPS thirty years ago, making it a pioneer in Japan in implementing the Toyota concept. After three decades of practice, the awareness of the need to adapt to their own circumstances led in 2005 to a departure from simply copying, and to a new beginning with a number of significant adjustments (*Nihon Keizai Shinbun* 24.3.2006). Other companies are making their own new search for efficient production (*Nihon Keizai Shinbun* 25.3.2006). This shows primarily one thing: Even in Japan, application of the TPS is associated with difficulties; for mere imitators, there is no guarantee of success. It is safe to say that only long-term approaches will be successful when it comes to applying the TPS. With the dawn of the 21<sup>st</sup> century, the question of whether the Toyota production system has become a universal model beyond the automotive industry can be answered with a resounding 'yes'.

To what extent Toyota will be able to pick up where the previous success story left off remains to be seen. The success of a company is dependent on many factors; while manufacturing excellence and

improvement expertise may be necessary, they are not sufficient in themselves. Nevertheless, the following can be said with confidence: The TPS represents Japan's greatest contribution to the ongoing development of management and technology for industrial value-added processes. Thanks to the TPS, the direction of the knowledge transfer has been reversed – at least in one area – a century and a half after Japan was forcibly opened up by superior Western technology.



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