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## Lean Leadership – fundamental principles and their application

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### Abstract

Lean production systems (LPS) have become state of the art in today's production facilities. But still, few enterprises succeed in maintaining a sustainable continuous improvement process (CIP). In many LPS, solely methods and tools are in focus of the implementation. But they merely represent the superficial elements of LPS. The actual key success factor is the involvement of employees in daily improvement. This can be achieved through a different way of leadership, the lean leadership. Although the importance of lean leadership has already been emphasized by many authors, so far no consistent structure or definition of this approach exist. Therefore, a literature study has been carried out, aimed at identifying the relevant principles of lean leadership. A subsequent survey reveals the application of lean leadership and points out future possibilities for improvement. The majority of participants confirms the particular importance of lean leadership and claim to apply almost all its elements in their enterprises. But the results also indicate that some elements have been misinterpreted and others are not used as thoroughly as they should.

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### 1. Introduction

Lean production has evolved to the state of the art in manufacturing. [1] The results of an international survey showed, that 80 % of the participants claim to use the principles of lean production systems (LPS). More than half finished the implementation and improve their LPS continuously. [2] Other studies show comparable results. [3-4]

However, in many enterprises the results do not meet the initial expectations or do not last very long. [5-7] Often, people focus on methods, but methods are just the visible part of LPS. Key factor for the sustainable success are the employees. [6][8-9] Methods and tools are very important but they cannot achieve any results if leaders do not have a deeper understanding of lean. [10] The implementation of methods and tools is indeed the far easier part of LPS implementation. However, the biggest challenge is the change in behavior and mindset of employees and leaders. [11] Main difference between lean and former mass production approaches is the role of employees. The separation of white and blue-collar

workers does not exist in lean production. The task of optimizing processes is more decentralized in order to benefit from the employees' tacit knowledge about operative issues. The employees are the first ones who notice deviations from the standard and they know best about common defects and disturbances. [12]

The real scope of LPS implementation can be described with Liker's 4P model (figure 1). [7] It names four relevant aspects of lean: philosophy, process, people and partners as well as problem solving. Most enterprises have focused on the process and have eliminated waste by using one piece flow, error proofing, standardized work and many more. But they have neglected the other three P of lean. [6-7] This is also described as toolbox lean [6] because people thought they could pick some single tools and have thereby implemented a lean production system.

The aim is to continuously improve every process every day and to achieve a so-called continuous improvement process (CIP). Of course, employees cannot shoulder this alone. Often, they are strictly bound to their workplace and they usually work in standardized work systems that do not leave much time for idle or

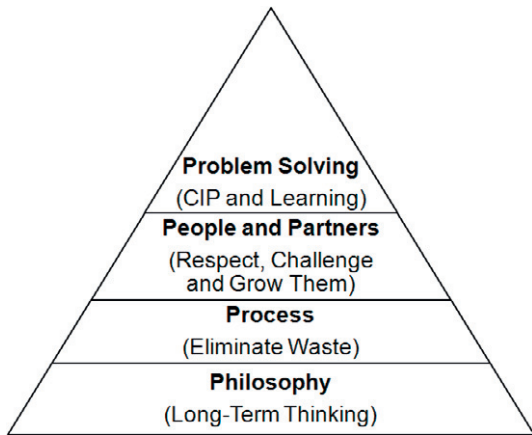


Figure 1. 4 P model of lean production systems [7]

improvement. Therefore, the organizational structure has to provide time and trained employees for improvement. This is often solved by establishing the hancho position. The hancho controls the improvement actions on the shop floor level. [1]

This change on the operational level has a strong impact on the daily cooperation between shop floor workers and operative management. In the past, management instructed the workers in their improvement actions. Now, operative employees have to point out improvement possibilities, too. Therefore, leadership needs more employee participation and employees need basic knowledge about lean production systems. Otherwise, improvement actions are not focused and will not benefit the LPS.

Since employee participation and employee knowledge are the foundation for lean leadership, they have been described in earlier papers [13-15]. Several authors acknowledge the importance of lean leadership in LPS implementation [5-7][11][16-17]. Lean leadership seems to be the missing link between lean production with its widely known methods and a self-improving enterprise with a true CIP. [11][6] However, no consistent approach for the structure, principles and methods exists so far.

This paper shows different approaches for leadership in lean production and combines them to an integrated lean leadership system.

**2. Basics of Lean Leadership**

Customer value has an extraordinary importance in lean production systems. The customer decides whether an activity is value adding or not. Generally, the customer pays for the shape and the correct operation of a product but not for organizational activities at the producer’s facility. According to this, leadership can never be value-adding. A lean leader has to be aware that he is not the person who adds value to the product; it is the shop floor worker. Leadership can only set up the required

framework for an ideal value creation. In other words, the workers are the outfield players, they score. The leader is the coach who creates the strategy, builds the team and develops their skills. [5]

Lean leadership is not a substitute for LPS nor is it an additional feature. It is necessary to achieve a continuous improvement of the LPS and all its processes. Lean leadership is the missing link between toolbox lean and the learning and continuously improving organization of lean thinking. [6] [11]

Since continuous improvement has to be provoked by shop floor workers [1][5][12][18], lean leadership focuses on operative employees but is also valid for every other leadership relation. As the 4P model describes, a lean philosophy with a long-term thinking should be an inherent part of lean leadership. This also results in a long-term and sustainable development of employees and leaders. An often quoted saying from Toyota describes this matter felicitously: “Before we build cars, we build people.” [7][19]

Based on these requirements, lean leadership can be defined as follows:

Lean leadership is a methodical system for the sustainable implementation and continuous improvement of LPS. It describes the cooperation of employees and leaders in their mutual striving for perfection. This includes the customer focus of all processes as well as the long-term development of employees and leaders.

In order to describe the lean leadership system comprehensively, various approaches of different authors have been analyzed and five basic principles could be derived (figure 2).

The *improvement culture* comprises all attitudes and behaviors that result in a continuous striving to perfection. Of course, perfection is often not achievable, it describes a state with zero defects, zero inventories and none of the other kinds of waste. An important aspect of this principle is the long-term thinking. [7] Part of the improvement culture is a different understanding of failure. A failure shows possibilities for improvement and learning. The goal is to find the root cause of the failure and to make sure, this failure will not occur

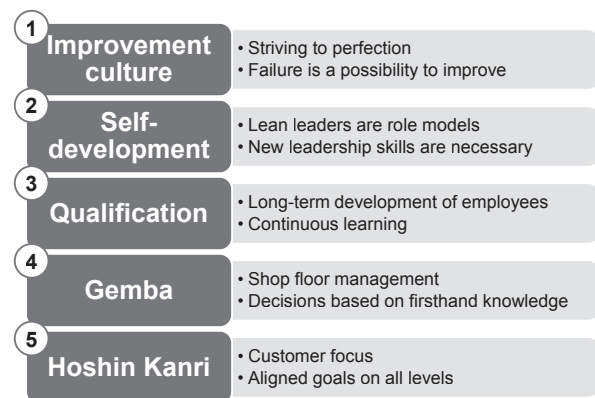


Figure 2. The five principles of lean leadership

again. [5][20] In contrast to common mass production, the root cause is in focus not the person who caused the failure. This is often called no-blame culture. [20] The improvement culture, also known as lean culture, is a very fundamental principle and its importance is emphasized by many authors. However, it does not belong to the visible part of LPS and is often neglected. Still, the improvement culture is essential to a successful LPS implementation. [21] [7] It is necessary that leaders constantly request challenging the current processes in order to improve them. [5][22]

A common misunderstanding concerning the improvement culture is the worker's role in CIP. Shop floor workers might have the best impression of the weaknesses and failures in their processes. However, they cannot fix them alone. They need support from the management in order to maintain improvement activities at all levels and all processes. The continuous improvement process does not work without formal rules and management support. [23] Lean leaders have to pick up the employee's ideas and help to apply them in practice. The improvement process might be more decentralized but leadership still plays a major role in CIP. [16] [22] On the shop floor, the hanchō coordinates the problem-solving and process improvement of the respective team. Besides CIP, he also controls the use of standards. [24]

The *self-development* is an important principle of lean leadership [5][16][20] since some attributes depend on the leader's personality but others have to be learned and developed. [5] The transition to lean leadership requires new leadership skills. Both leaders and workers are guided by a sensei, who is a kind of teacher or mentor. [25] They use short learning cycles based on the PDCA (Plan-Do-Check-Act, also known as Deming cycle) approach to achieve a steady self-development. [5]

Besides the self-development, lean leaders have to develop others. The *qualification* of employees is a fundamental task in lean leadership. It enables workers to participate in the continuous improvement. The continuous development of processes must go along with a continuous development of people. [5] Qualification is not limited to conventional education in classes or trainings. Most of the qualification in lean leadership happens on a daily basis and takes place at the shop floor. The employee is constantly challenged and learns by solving actual problems. In this context, many enterprises use coaching approaches because they meet the new requirements best. In the past few years, the so-called Toyota kata method has been established in industry. It presents a formal structure for coaching and improvement, which helps to establish daily routines that lead to a sustainable CIP. [26]

The term *gemba* is Japanese and stands for the real

place. It refers to the shop floor or rather the place of value-adding. [22] The *gemba* principle is also known as go-to-gemba or genchi genbutsu. According to the *gemba* principle, lean leaders should go to the shop floor frequently in order to truly understand the processes and to make the right decisions. [7] [10]

A well-established method of *gemba* is the Ohno circle. [7] Therefore, an imaginary or otherwise a real circle is drawn on the floor. The lean leader steps into it and observes the processes. This can take several hours until he understands the process with its failures and improvement possibilities. In this way, the lean leader gets a first-hand impression of the problem. His decision will be based on facts and observations. [7] [16][22] With this approach, the lean leader can identify the root cause of a failure without being misled by inaccurate data collection or interpretation. [20][5] Taiichi Ohno was the co-inventor of the Toyota production system, which is the origin of lean production systems. Ohno, who invented the Ohno circle, insisted that his managers had to "wash their hands at least three times a day". Hence, lean leaders should go to the shop floor and get their hands dirty by working on process improvement. Even senior managers should locate their offices close to the shop floor to be close to *gemba*. [16] This leadership behavior also illustrates the leader's appreciation of the operative work in the enterprise. [5]

In order to integrate these aspects in their daily behavior, lean leaders should follow the five golden *gemba* rules [22]:

1. Go to *gemba* first.  
When a problem arises, lean leaders should go to the place where it occurred.
2. Check.  
Immediately analyze all things that might be involved in the problem as long as they are in the failure causing condition. This might include products, processes, people etc.
3. Take temporary countermeasures.  
Before spending much time and effort for the fourth rule, some countermeasures should be found that satisfy the customer immediately. They might be much more expensive than the standard process but necessary to find time for rule four.
4. Find the root cause.  
As described before, it is very important to identify the root cause of the problem. Otherwise, the solution will not be effective for long. During this step, the method of asking why five times can be applied.
5. Standardize  
Once the root cause is found, the permanent countermeasures can be taken. The current process has to be revised and a new standard must be found.

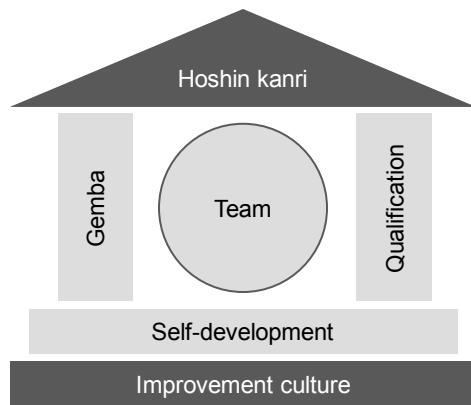


Figure 3. The lean leadership model [2]

The fifth principle of lean leadership is *hoshin kanri*, in some enterprises also known as target management or policy deployment. Due to the more decentralized improvement activities, a superior system is necessary which aligns the directions of the single activities. *Hoshin kanri* focuses the CIP activities of each team on a long-term goal to make sure that improvement activities do not have opposite directions. Every team has to be aware of its contribution to the big-picture goal. [5] In *hoshin kanri*, the PDCA cycles of all hierarchy levels are systematically aligned. Within the large strategic PDCA, there are smaller operative PDCA, which contribute to the strategic goal. [27]

Figure 3 shows the five principles in the lean leadership model and demonstrates the central role of the team.

### 3. Application of Lean Leadership

Almost every manufacturing enterprise has tried to implement lean production. Only few seem to have a comprehensive and systematic lean leadership. In order to determine the current state of lean leadership in industry, the institute for advanced industrial management conducted an international survey in the year 2012, concerning this topic.

A total of 91 enterprises participated, 54 were from Germany and 37 from other countries. 39 % of the participants are in the automotive industry, 13 % machinery and plant engineering, 7 % chemical or pharmaceutical industry, 4 % electrical industry and 37 % others.

Some questions directly referred to single lean leadership principles. For example, if they use self-development or *hoshin kanri* and how important these principles are. Other questions indirectly aimed on the use of principles like the question how often they are going to the shop floor to get an own impression of the process. Another indirect question was if the team members would be able to temporarily represent the team leader during his absence. Lean leaders develop

their team members and communicate their targets. A good lean leader will make himself superfluous. All results have been analyzed concerning this aspect. Both, the very good and the poor teams give lean leadership principles a high importance. But the very good teams more often get a sense of achievement, grow beyond themselves, solve problems independently and see their leaders as role models.

About 80 % of the participants claimed to use lean principles. In order to get a reference value some questions concerning well known lean methods were asked. For example, 92 % of the participating enterprises use the 5S method. This confirms that the visible part of LPS is commonly used.

Most enterprises know that an improvement culture is important but the actual presence of such culture is hard to determine. A possible indicator could be the CIP. Asked whether the enterprise has a CIP, 92 % answered yes. However, it is doubtful that this is a true CIP in terms of an improvement culture. Other authors estimate the share of enterprises with a real lean (improvement) culture at less than 1 %. [8] Furthermore, enterprises have been asked if the enterprise's core values are conveyed to the employees. About 50 % of the German participants strongly agreed but only 5 % strongly agreed that employees live these core values. Outside of Germany participants strongly agreed to 61 and 42 %. 58 % of all participants answered that these values are known by leaders. 14 % of the Germans strongly agreed that the core values are also lived by leaders. In the other countries people strongly agreed to 55 %.

The application of an improvement culture is hard to determine. Still, the core values of an enterprise should be known and lived by employees and leaders. If not, an improvement culture will not be successful either. The results indicate that especially German enterprises have deficits in this field. Lean leaders should be a role model for their team members. [11]

Merely 42 % of the participating enterprises declared that they use the principle of self-development. Furthermore, the importance of this principle has been rated lower than all other principles. Obviously, the potential of self-development has not been identified yet. Enterprises fail to recognize that it is the basis for employee qualification and continuous improvement. A more detailed analysis of the results has shown that self-development gains in importance with the quantity of employees in the participants' area of responsibility. Leaders who are responsible for 100 and more employees give self-development a significantly higher importance than leaders for up to 15 employees, especially in Germany. Cause and effect of this phenomenon are not clear yet. On the one hand, self-development might not be as important to lead a small group of people. On the other hand, leaders who support

their self-development might be promoted more often. Employee qualification is applied by 83 % and its importance is assessed as very high. In Germany, it is even rated as most important principle. Overall, 74 % declare to use coaching, which is less common in Germany (60 %) than in other countries (90 %). Nevertheless, whether coaching is actually applied is debatable. To the question, which methods they use, only 37 % answered coaching. Similar results were observed with the method mentoring. Here, 50 % answered that the method is applied in their enterprise. A few questions later, only 3 % answered mentoring when they were asked, which methods they use. In summary, people seem to be aware that coaching and mentoring are important and they pretend to use it. If they are later on asked which methods they use to qualify their employees, answers differ. Another explanation might be that mentoring and coaching exist in many enterprises but are not used by every leader. A closer look at the results shows that mentoring gets a higher importance if the participant is responsible for more than 100 employees.

Apparently, qualification exists in most enterprises. Nevertheless, the results indicate that the applied methods might not have been adapted to the requirements of lean leadership.

The gemba principle is applied by 50 % of the participating enterprises. In Germany only 39 % and in other countries 61 % agreed to use gemba or genchi genbutsu. Surprisingly, the German participants rated gemba as more important than the others did. Even the CIP had less importance in Germany.

Compared to the other lean leadership principles, gemba has little application, especially in Germany. Since most enterprises identified the importance of gemba, they might lack practical guidance for the application.

Hoshin kanri is applied by only 29 % of the participating enterprises. This is the lowest degree of application of all principles. It also differs strongly in the international comparison. In Germany, only 10 % of the participants said they would apply hoshin kanri. Outside of Germany 55 % of the participants use hoshin kanri.

The second question concerning this principle was regarding target agreements. This approach is related to the management by objectives and is more common in mass production. It is a target system for employees, which is used to focus activities and to measure personal results but it is not the same as hoshin kanri. They often lack the long-term thinking, use metrics, and reward systems, which disagree with the lean leadership approach. [5] This kind of target management is very common in Germany. More than 85 % of the participants declared to use target agreements.

The third question concerning this topic revealed another

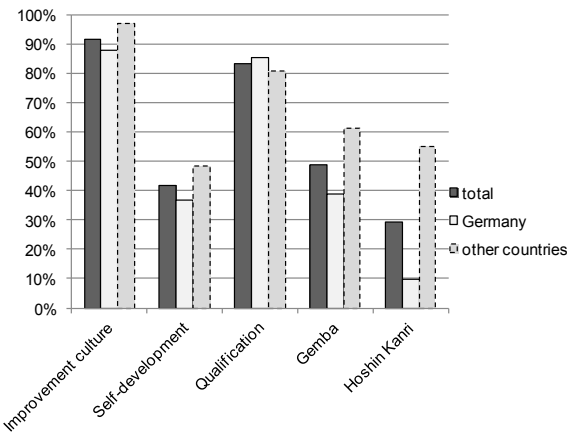


Figure 4. Application of lean leadership principles [2]

indicator for poor hoshin kanri. Only 37 % strongly agree that the enterprises vision is known by employees. The result for leaders was at least 57 %. The results indicate that hoshin kanri is not properly used in most enterprises. The widely spread target agreements often focus on the management. Hence, enterprises have problems to communicate their vision and targets to shop floor workers.

In general, enterprises seem to know the importance of lean leadership but tend to have problems with its application. Especially hoshin kanri and self-development should be applied more. Improvement culture and qualification seem to be commonly applied. However, the way qualification is conducted has to be adapted to lean production systems and it has to be checked whether the enterprise has achieved a true improvement culture, which is more than a corporate suggestion system. The application of lean leadership principles is shown in figure 4.

#### 4. Conclusion

The sustainable implementation of lean production systems requires a change in the daily cooperation of workers and leaders. In the present paper, a new definition of lean leadership was derived and five fundamental principles were identified. The application of these principles was evaluated by an international survey among 91 enterprises.

In order to achieve a better improvement culture, the lean leader needs to be a role model for his employees. The importance of self-development has apparently not been identified so far. This principle is the foundation for the development of employees and enables the lean leader to conduct a convincing gemba management. The importance of gemba seems to be widely known but enterprises might need new methods for the specific application. The five golden gemba rules give lean leaders a first impression and guideline for applying

gemba. Most enterprises have some sort of employee qualification but they should integrate methods like coaching and mentoring in their existing qualification systems. Especially in Germany, hoshin kanri is scarcely known. Existing metrics and reward systems should be redesigned regarding lean leadership principles. In summary, enterprises have realized the importance of lean leadership but have not adapted their leadership system so far. In order to truly understand the actual application of improvement culture in today's enterprises further analysis is necessary.

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