

## Kaizen Workshop as an Important Element of Continuous Improvement Process

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### Abstract

*Nowadays continuous improvement process is part of every world class manufacturing company. As such there is variety of different tools which help to manage it and lead it in the proper direction. Outcome of continuous improvement activities is flexible production with shorter lead time, and satisfied customer. To accomplish above mentioned goals, one of possible methods which can be used is kaizen. This paper presents basics of kaizen, and why it is important to conduct regular kaizen workshops as part of Continuous Improvement Process in a company. Also a Case Study about results of kaizen workshop in one Croatian Company is presented.*

**Key words:** *Lean production, Continuous improvement process, Kaizen event*

### 1. INTRODUCTION

As the latest economic crisis showed, companies must take care of its resources, people and processes, if they want to survive in a competitive global market. In other hand if a company wants to be competitive, innovative and leading in its industry it has to continuously improve its processes and employees. This can be achieved through practicing *kaizen* on the daily basis [1]. It is also important how does company envisage itself in tomorrow's world, in other words said, the company has to know what ambitions and goals are involved, and what actions needed to be taken now and in the future to ensure that this envisaged state is achieved. Best in class production companies use its production as competitive advantage, so they put efforts to make it more productive, efficient, and innovative. Innovation counts as number one economic driver. Even though many find innovation as new product or service, innovation is also about processes. Innovation within the process does not need to be a totally different way of performing work, innovation is also every small improvement made to improve productivity, efficiency, bottom line, workers satisfaction or cut the cost. Innovation is the product of creativity, professional methods and hard work. And as mentioned above, innovation within processes will enable company to strengthen its position on the competitive global market. One of the nowadays commonly used methods to make

processes productive, efficient, cost effective and innovative is lean, and use of *kaizen* workshops.

Lean method when applied reduces and eliminates non-value adding activities from the process, and also optimizes value added. When company starts with lean implementation, first step should be value stream mapping. From the value stream map, with the help of *kaizen* flashes, spots for possible improvement are identified. This *kaizen* flashes serve as a lead for further *kaizen* workshops where particular problem will be solved.

The factory is seen as a system of humans using equipment to satisfy customers. [1] One of the main principles of lean thinking is respect for the people [2], and when this principle is in place in production, then there is an environment where it is safe to admit problems and get help to solve them. In this kind of environment it is possible to conduct *kaizen* workshops, and make improvements

This paper presents results of one *kaizen* workshop conducted after company mapped all its process and 5S took place. In the first part of the paper some theoretical basics about continuous improvement and *kaizen* workshop as a 'one-day effort evolving multiple stakeholders', are given [3]. Second part of the paper describes one-day *kaizen* workshop organized in one Croatian company. The workshop was organized with

aim to solve one specific problem, recognized and marked as a kaizen flash during Value stream mapping activity held in the company previously. ‘The basic concept of kaizen workshop includes defining problem, determining the current state, generating ideas for improvement, selecting the best ones, applying them and evaluating them’ [4]. During the *kaizen* workshop described in this paper the cause of the problem was found, new solution was arranged and plan for implementation of corrective measures was made.

**2. KAIZEN WORKSHOP**

*Kaizen* is continuous, incremental improvement of activities with aim to create more value and eliminate waste [2]. *Kaizen* can be also understood as a systematized way to reduce cost, but this is not its main purpose. Surely, result of *kaizen* activities can be reduced cost, but *kaizen* emphasizes different way of thinking.

*Kaizen* events (e.g. *kaizen* workshop) are also supposed to be training for employees participating in them [5]. Participating in *kaizen* workshops participants also develop their problem-solving skills and on the same time increase their motivation to participate in following improvement activities.

When talking about *kaizen* workshops, they are established to make some improvements. The purposes of process improvement in the factory can be [1]:

1. Increasing productivity,
2. Improving quality,
3. Cutting time,
4. Cutting cost

To make improvement, normally some particular problem has to be solved. In this case, the success of *Kaizen* activity depends about problem solving skills of people involved in them. Problem solving is also used as a tool within *kaizen* workshop and there are three essential steps to problem solving [1]

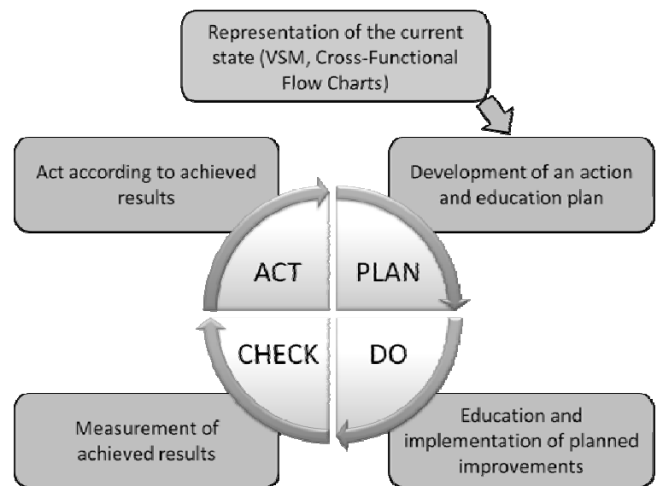
1. Find the problem
2. Clarify the problem
3. Find the cause

*Kaizen* workshop normally starts with already defined problem. Even though, solutions for the problem of the workshop are not defined before the beginning of it, it is important that the clear goals of the workshop are established. If there is just one goal, there is always more than one way to achieve it. This implies in the situation where current methods are used as only means to achieve right goals, and no other means are possible, in this kind of environment improvement ideas will never emerge [1]. In other words said if the company thinks that its methods for continuous improvement are the only right methods, and it is close for new one, it is hard to expect that there will emerge any improvements.

As said above, although sometimes the goal of the workshop is defined, that target condition which is aimed to be achieved and its path to attaining it cannot be predicted with exactness. Thus, the path has to be found by experimenting. Very known and reliable tool, which is used to conduct above mentioned experiments, is Plan – Do – Check – Act method [6]:

1. **Plan:** Definition of the expected results and actions.
2. **Do:** Process is run according to the plan.
3. **Check:** The actual outcome is compared with the expected.
4. **Act:** What works should be standardize, or new PDCA cycle should be started.

Customized PDCA circle, defined for particular company mentioned in this paper, is shown. [Figure 1].



**Figure 1.** PDCA circle

To start with continuous improvement activities, essential thing is to know the current state of the process which is to be improved, or the full nature of the problem. To get the wider picture of the process, tools such as Value stream mapping or Cross-functional flow charts are used. When problems are obvious, action plan to solve those problems has to be developed together with needed education plan for people participating in solving those problems. In Do phase, all planned education is conducted, and planned improvements are implemented. After Do phase all results have to be measured and according to achieved results new plan has to be made.

What are success factors of the *kaizen* event or which input factors have the strongest relationship with *kaizen* event support, there is still little empirical evidence, but as shown in a study [5] there is significant positive relationship to attitude of *kaizen* event or *kaizen* capabilities to:

1. Management support
2. Team autonomy
3. Affective commitment to change
4. Goal difficulty (excluding technical success outcomes)

5. Work area routines

In the following chapters *kaizen* workshop, which took place in one Croatian company, will be described to show how successful tool it is when conducted in the proper way. Also critical factors of successful *kaizen* workshop are going to be pointed out.

3. CONTINUOUS IMPROVEMENT: CASE STUDY

The *kaizen* workshop took place in Croatian transformers production company. The workshop was a part of a big continuous improvement project, which main goal was to cut the production lead time. It is important to emphasize that this company was developing the culture of continuous improvement for a long time which was a good starting position at the beginning of the workshop. Thereby, great employee's motivation and engagement could be expected.

The company started with the projects of continuous improvement several years ago before this workshop. The main problems that the company was facing with in that period were significant fall in prices of transformers as well as bigger and stronger competition which depreciated prices even more. This was good opportunity for the company to start with program of continuous improvement and with lean implementation. Namely, crisis is often the key factor for starting continuous improvement, and it gives companies incentive to continue with introduction of changes which affect both departments and whole organization of this particular company [2]. The strategic decision was to cut cost by 30 per cent through raising productivity and cutting cost of processes, capital and material. The goal of one of the first released projects was to double production throughput time. The project was planned for the next three years and consisted of several smaller projects. First of those smaller projects was Value stream mapping, which purpose was to depict all material and information flows in the company and to detect opportunities for improvement. *Kaizen* workshop that will be discussed further in this article was derived from one of the current state value stream maps. The basic understandings for Value stream mapping project was idea that all the activities in the process could be defined as those that add value and those that do not add value [2], and additionally that this process utilize various resources as material, equipment, work and infrastructure [Figure 2].

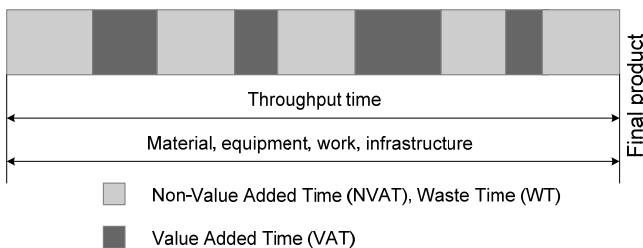


Figure 2. Typical ratio of VAT, NVAT and WT

Value stream mapping presents a powerful tool for new improved production process determination [7],[8]. Value stream mapping of the production processes in this company showed many week points of the production flows, and those became opportunities for improvement and cutting throughput time. In the very beginning of the continuous improvement project, company's executive manager has released the letter for all employees in which he explained that the only solution for staying competitive and preserve employment is to cut all unnecessary cost from the processes. And he underlined that this could be achieved only by engagement of all employees. The CEO also discussed directly with employees about problems on the daily basis. This was very important because this demonstrated to the workforce that the CEO is a leader who takes the responsibility and supports change and continuous improvement.

3.1 Kaizen workshop

As mentioned beforehand, the main purpose of value stream mapping was to detect problems, as possible opportunities for improvement. One of the problems that occurred and needed to be solved was problem with delivery of spare parts. It was decided to solve this problem during one day *kaizen* workshop.

It happens that spare parts are found in warehouse after product was already delivered to the customer, which requires additional delivery costs, but also sometimes happens that customer itself informs sales department about missing parts in delivery. Some of the issues that arose from this problem and needed to be solved were:

- Production planning department doesn't receive clearly defined every spare part
- Responsibilities for every activity are not defined
- Shipping instructions do not contain all defined spare parts
- Very weak communication between departments and employees involved in the process.

A few questions that could lead to a solution of the problem might be taken into account:

- Are all activities within the process of specification, production and delivery of spare parts done correctly?
- Did the problem occur during the transport of spare parts to the customer?
- Were products handled in right way as it was specified in the procedures, and were there any abnormalities?
- Are there any activities in the process, for which required procedures were not written?

All this issues needed to be discussed and solved during the workshop. There were few ideas already about possible improvements, but still it was not clear what are responsibilities of everyone involved in the process and the process was not standardized and well defined.

The workshop took one day. Plant manager have already had basic knowledge and experience in lean thinking and *kaizen* workshops and truly believed in success of their workshop. He was aware that all the employees engaged in the process don't understand the process completely and that this was the main barrier for good communication and smooth process.

Expected results of the workshop were:

- Clearly defined process (standard procedure)
- Simple process
- Clearly defined responsibilities in the process
- Complete delivery according to the order
- Reduction of all unnecessary communications

- Reduction of variations and deviations in the process.

For the first phase of the workshop it was planned to define current state by mapping the process, brainstorm ideas and new process to define. At the very end of the workshop list of corrective measures with the all necessary information was planned to be given

In this workshop participants were employees from different departments: continuous improvement department, sales, purchasing, preparation, engineering, technology, testing facility, warehouse and workshop preparation.

The idea from the very beginning was not only to find the causes of the problem and generate ideas for improvement but to apply them directly and make that new process standardized. If the work is not standardized and it is different each time, there is no basis for evaluation, meaning no reference point from which to compare [8]. In that context an intro presentation about standard work and ice-breaker game about this issue was held which gave good starting point in which direction the workshop should go.

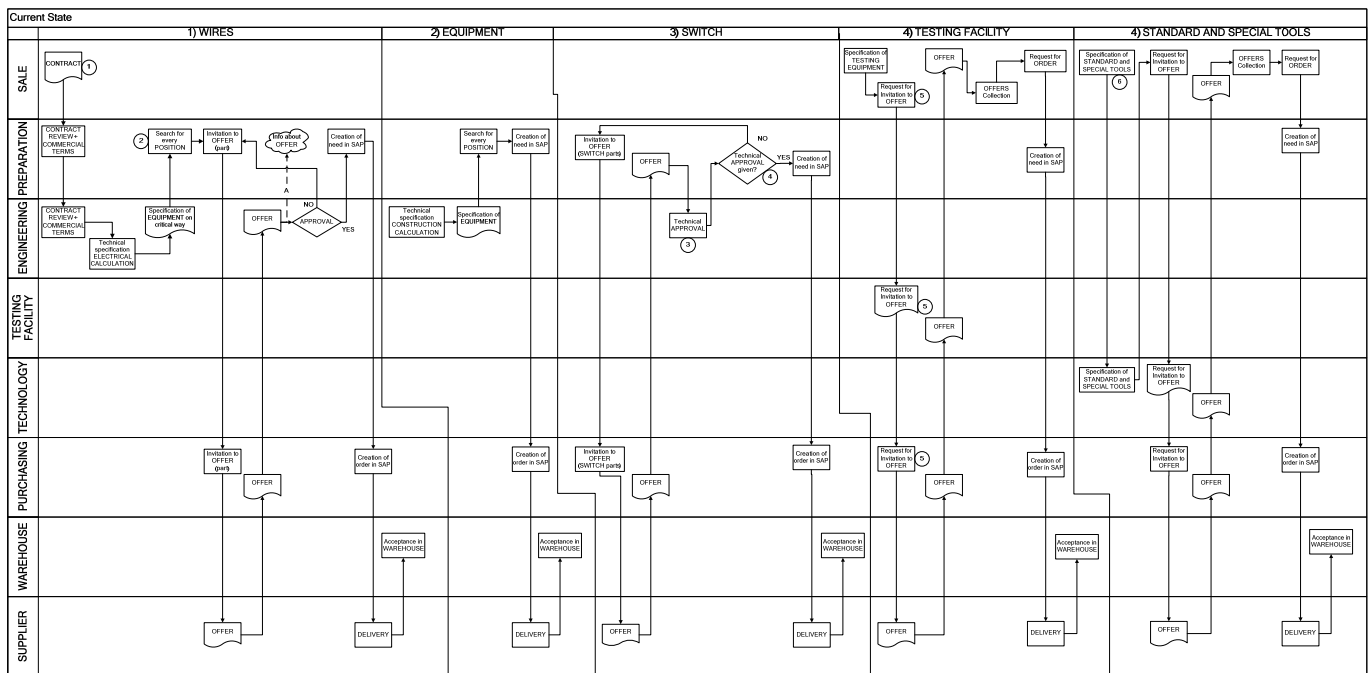


Figure 3. Current state Cross-Functional Flowchart

During the first phase of the workshop the current state of the process was defined [Figure 3]. The tool used for defining current state of delivery of spare parts was cross functional flowchart. This flowchart showed all activities needed to be done from the period of contracting to the shipment process. It came out that some of employees did not know how the whole process looks like and how their job affects job and efficiency of the worker in the next phase of the process. This showed how important the mapping activity was for understanding the flow of information and to discover where and why problems occur. Here is the list of the main problems that were defined during the activity of mapping the current state:

1. Spare parts are vaguely defined
2. Wires on critical path are not specified
3. Delay in process caused by unissued technical approval
4. Technical approval is not issued
5. List of standard testing equipment does not exist, and it is unclear who requests for offer
6. It is not clear who is responsible for defining specifications of specific groups of the spare parts

7. The trigger for activation of request for making shipping documents is not defined
8. Technology does not have proper entry data.

After the brainstorming session in which the corrective measures were defined the future state of the process was designed [Figure 4]. This part of the workshop was very useful because employees could hear view on the problem from the different perspective, i.e. how others

involved in the process understand problem in a different way. It was very pragmatic and interesting to hear that some of the workers did not know how their job affects job of another and that they until now assumed the flow of the process totally differently and actually they assumed the process inaccurately. The future state represents the process as it should look like after applying all the measures that were proposed in the brainstorming activity [Figure 4].

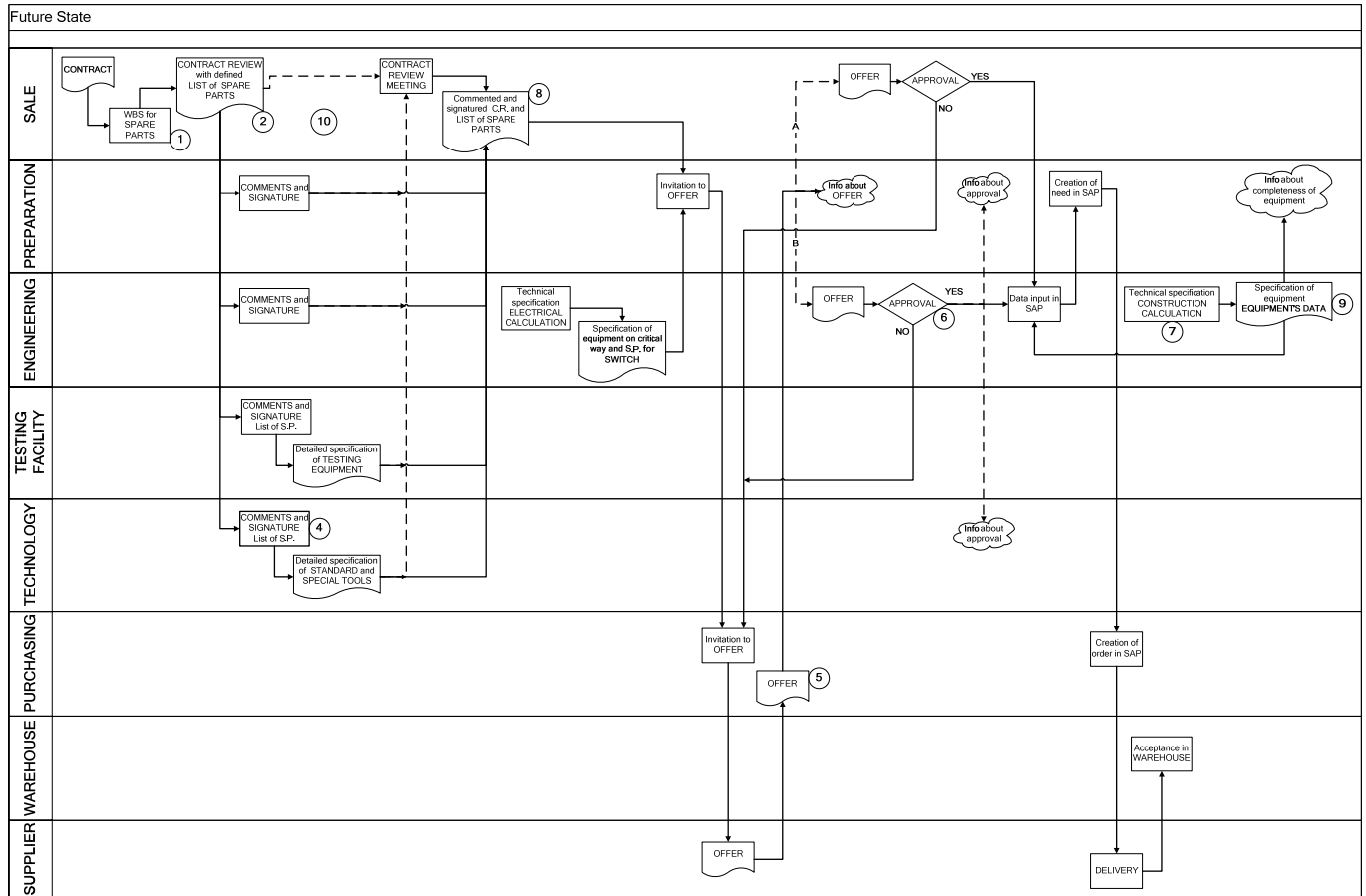


Figure 4. Future state Cross-Functional Flowchart

During the session of designing the future state of the process ten measures were defined. Implementation of those measures resulted with new better and efficient process, which was shown in the future state [Figure 4]. The corrective measures with description, responsible persons and due dates are given [Table 1].

Table 1. Corrective measures from Future state map

C.M.	Name	Description	Resp.	Due date
1	Spare parts included in Contract Review	Complete list of spare parts has to be included within Contract Review	S.N.	15.1. 2012
2	WBS for Spare parts	WBS has to be open for spare parts before Contract Review started	S.N.	15.1. 2012
3	Technologist involved in Contract Review	Technologist might be included in the phase of Contract Review	S.N.	15.1. 2012
4	Responsibility of Contract Technical Leader	CTR has to specify equipment appearing on the critical path	P.V.	31.1. 2012

	(CTR)			
5	Responsibility of Procurement Officer	Procurement Officer has to deliver offer to CTR and Preparation department	P.V.	15.1. 2012
6	SAP administrator in construction	Special and standard tools have to be entered into SAP	S.N.	15.1. 2012
7	Equipment leader responsibility	Equipment leader is responsible for specification of equipment	P.V.	31.1. 2012
8	D3 workflow	SAP administrator, after reviewing completeness of spare parts, starts D3 workflow	P.V.	31.1. 2012
9	Vertical communication	Vertical communication has to be done within 24 hours	S.N.	15.1. 2012
10	The Bill of Contract	The Bill of Contract has to be filled retroactively	S.N.	31.1. 2012

The main success of the workshop was that the new process was approved by all stakeholders involved.

The number of activities in the process was decreased from 57 to 33, and the number of documents released during the process was also reduced. In addition and the most important is that responsibilities were clearly defined as well as triggers for information's flow in the process.

## 5. CONCLUSION

Continuous improvement and *kaizen* workshops are necessity for survival in constantly changing environmental conditions. In this paper the importance of continuous improvement projects was discussed. It is also shown that the main role for the successful improvement projects plays general manager's support and engagement of all employees. It is very important for *kaizen* workshop that all stakeholders are involved, while that is the only way to design the process that will be approved and accepted by all workers. Thus the new ideas and changes are easily applied and sustained in the future. Culture of continuous improvement in discussed company was also very important factor for the success of the workshop. At the end, it has to be pointed out, that one day workshop might be to

exhausting and therefore minimum two-days workshop is suggested.

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# Kaizen radionica kao važan element procesa kontinuiranog unapređenja

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## Rezime

*U današnje vreme, proces kontinuiranog unapređenja je deo svake svetske proizvodne kompanije. U takvoj situaciji, postoji raznolikost različitih alata koji pomažu u upravljanju tim procesom i njegovom vođenju u pravom smeru. Rezultat aktivnosti kontinuiranog unapređenja je fleksibilna proizvodnja sa kraćim vremenom od početka do realizacije posla, kao i zadovoljna mušterija. Da bi se postigli ovde pomenuti ciljevi, jedan od mogućih metoda koji može da se upotrebi je kaizen. Ovaj rad predstavlja osnove kaizena, kao i zašto je važno sprovoditi redovne kaizen radionice kao deo procesa kontinuiranog unapređenja u kompaniji. Takođe, predstavljena je studija slučaja vezana za rezultate kaizen radionice u jednoj hrvatskoj kompaniji.*

**Ključne reči:** *Lean proizvodnja, proces kontinuiranog unapređenja, Kaizen događaj*