LEARNING TO SEE – MANAGERS WORKING IN THE GEMBA AS PART OF THE TIDHAR WAY TRAINING PROGRAM

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ABSTRACT

Implementing lean management systems is based on implementing lean tools and fundamental cultural change. Most organizations manage to apply several lean tools on the technical level but find it hard to make the leap towards true lean transformation. Tidhar, a leading Israeli construction company, was no different. Its journey started with implementing VSM, A3 and parts of the LPS™, but in order to make a significant change a concentrated management training program was necessary.

'Tidhar Lean Boot Camp' is a basic six day lean training program and its purpose is to transform traditional managers into lean managers by breaking existing paradigms, understanding wastes, seeing them first hand in the Gemba and learning to use standard lean management tools to eliminate them. This article reports on the learning achieved during two days of a recent boot camp session that were devoted to first-hand work in the Gemba, where ten experienced managers from different levels and departments undertook trade work in the field.

The results were overwhelming as each manager came back with at least two or three fundamental wastes that could not be noticed in any way other than by living this experience.

INTRODUCTION

Tidhar is a medium-size development and construction company that began its lean journey in June 2011 as part of its strategic plan to expand its profit margin. Most of the implementation was focused on tools such as VSM, basic A3, improvement teams and Last Planner™ in selected sites. Although the use of these tools showed small improvements, a deeper paradigm and cultural change was needed.

Part of the difficulty of obtaining that change was due to the perception of most of its managers that the company was already leading the Israeli construction industry in terms of profitability and productivity, and had very good practices and business performance. The challenge was to bring senior and mid-level management to realize and acknowledge the improvement potential by recognizing the gap between their perception of current workface efficiency and effectiveness compared to the amount of waste that is actually inherent in it.

As part of the effort to tackle the challenge, top management decided, with its lean consultant, to undertake a six-day training program in the form of 'Lean Boot

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Camp' for managers from every level. The highlight of the program was two full days of work in the Gemba, during which the managers had to work as professional trade workers.

In this paper, the authors adopt the role of reflective practitioners. The aim is to share knowledge and experience with the Lean Construction community in order to continuously improve their implementation, both through reflection and by stimulating feedback from the community.

BACKGROUND

ORGANIZATIONAL/CULTURAL CHANGE

In a 2009 article, John Shook described how the failing factory of NUMMI changed its culture under the management of Toyota (Shook 2009). He claimed that the change model was similar to the one developed by the leading MIT researcher, Edgar Schein, who distinguished between three levels in every organizational culture: the level of its artifacts, the level of its espoused beliefs and values, the level of its basic underlying assumptions (Schein 2006). According to Shook, trying to convince people to change their mind about their underlying assumption is useless and creates strong resistance to change. The only way to change the underlying assumptions is by changing the behaviors or artifacts. The key success factor in NUMMI, was that the new management did not try to influence directly on the underlying assumptions, but on the first level of behavior. The culture changed as a result.

Taking Tidhar's managers to the Boot Camp workshop aimed to change their behaviors, so that they could become the "wheels of change" for the organizational lean transformation.

GEMBA IN LITERATURE; HOW HAS IT BEEN USED; WHY IS IT EFFECTIVE

The Japanese word "Gemba" means the real or actual place, and lean practitioners use it to refer to the actual place where value is created. The principal of "*genchi gembutsu*"- the commitment to seeing things (*gembutsu*) first hand as they really are in the workplace (gemba or genchi) - was fundamental to Taichi Ohno's approach. Among Toyota's veterans, there were many stories about the famous Ohno Circle. The idea is based on the belief that you can understand everything that is important in a process, by standing and observing from a good spot in the workplace (Shook 2009).

Liker (2003) describes an interview with a senior Toyota executive, Mr. Minoura, about his personal experience in practicing Mr. Ohno's circle. According to Minoura, Ohno asked him to draw a circle on the floor of the plant and told him to "stand in the circle, watch the process" and think for himself during the whole day.

Womack described the "Gemba Walk" as a management practice to grasp the situation before taking an action (Womack 2011). He claimed that Gemba walks are crucial as organizations are managed and built in a vertical and complex manner, while value flows horizontally across departments or organizations to customers. Most of the managers look toward the top for direction, but value is created at the bottom where the actual work is done. A Gemba walk following the value stream could help managers to reconcile the horizontal view with the vertical view.

USE OF GEMBA IN THE CONSTRUCTION INDUSTRY

The importance of connecting managers to the workface is a well-known concept in the construction industry. However, in the entire IGLC paper database (IGLC 2013) the keywords 'workface' and 'Gemba' appear only four times in paper titles. In the Lean Construction Journal there is only one paper dealing with Gemba (Samudio et al. 2011). Most of these papers discussed the connections of the site managers such as project managers, project engineers, sub-contractors and logistics personnel, and one suggested using "Go to Gemba" as a research method (Olatunji 2008). No papers were found in the lean construction literature in which the Gemba approach was used to train high-level managers and/or nor did any report on establishing the approach as a daily practice.

WHAT IS BOOT CAMP?

Lean Leadership Boot Camp is a special training program designed to transform traditional leadership behaviors into behaviors centered on lean principles. While many lean initiatives are based on adopting the right tools, the purpose of the Lean Leadership Boot Camp is to train leaders in the organization in the deeper level of principles allowing them better implement the right tools. This is mainly done by focusing on the understanding of the 12 paradigms of a lean leader, which are based on Toyota principles as revealed in The Toyota Way (Liker 2003), and then teaching several key lean tools that support standard work. The workshop is based on a mix of theoretical sessions, simulations and on site experience in order to ensure a profound understanding of the principles. In order to keep the positive momentum of the workshop, each participant is required to make his own improvement plan for 30-60-90 days. Follow-up meetings are set in advance in order to ensure that the full plan-do-check-act (PDCA) cycle is kept.

METHOD

BOOT CAMP PROGRAM

The original boot camp program was planned to span seven consecutive days. Due to managers' schedule overload it was decided to shorten it to six days in total spread over three weeks (i.e. two days each week). The six days were divided as follows: the first two days were dedicated to learning lean principles such as waste and the 12 paradigms. During these days, to emphasize understanding some of the principles, the participants took part in the LEAPCON™ simulation (Sacks et al. 2007). At the end of the first day, a first Gemba walk was scheduled, in which the group visited one of Tidhar's construction sites. The second week was dedicated entirely to Gemba work. Each of the managers undertook trade work in the field such as formwork, rebar fixing, plastering, tiling, storekeeper, electrical and plumbing finishes. During these two days the managers were instructed to be common workers, meaning doing the actual work (not stand as observers) as instructed and without commenting on it or changing it. The last two days were divided between learning lean tools and preparing personal improvement work plans to implement them. Among the tools where 5S, SOE (Sequence of Events), Last Planner System™, visual management, Takt and the improvement kata. To practice the SOE tool another Gemba visit took place, where

the participants were divided to three groups and each group prepared detailed SOEs. To ensure the full attention of all participants and to make sure they were disconnected from their daily project management chores, the boot camp was held in a conference room away from the projects and the company headquarters. Furthermore, all participants had to deposit their computers and mobile phones (Figure 1) for the duration of the whole program (except during breaks and lunch).

Figure 1 -Mobile phones deposit board

LEARNING TO SEE WASTES

Lean thinking is different from other operational excellence methodologies, such as Six Sigma, Theory of Constraints (TOC) (Goldratt 1997) and others, in putting most of its attention in eliminating waste in order to increase value. For most managers this is not trivial since they are used to focusing on improving value adding activities.

In order to change the participants' points of view, they were first introduced to the notion that in most activities only 10% is value adding and the rest is waste. The participants then learned about the three waste categories: Muda (activities) with the eight different waste types, Mura (unevenness) and Muri (overburden). In smalls groups they had to find examples for each of the wastes in their daily process.

As mentioned earlier, to finalize the learning part, the group did their first Gemba walk to see the wastes on site. During that Gemba walk, each participant had to fill out a readymade form with examples of the eight different Muda, the Mura and Muri. The visit concluded in a group meeting to share and summarize the findings and the lessons learned. Although, the participants were highly experienced professionals, most of them only realized the amount of waste inherent in the process during the Gemba walk.

PREPARATIONS FOR GEMBA WORK

Bringing ten managers to work in the Gemba requires much preparation both of the participants themselves and of the workers and the managers who will host them. The preparation of the participants included Gemba Kata class and technical classes explaining the type of work each of them needs to perform. The emphasis was on the request to be a simple worker and to try not to be judgmental during the two working days. Each manager received the name of his Gemba manager, the name of the worker he was assigned to work with, and the working hours for the particular crew.

On the Gemba side, to prepare the workers and the managers, a one hour meeting in each of the hosting projects took place. During the meeting the purpose of the boot camp was explained, as were some basic Lean principles regarding giving respect and

continuous improvement (not all of the hosting managers were familiar with the lean methodology and principles). The hosting managers were asked to treat the boot camp participants as workers with no special privileges. They were instructed to give the participants a safety brief, sign them up for special equipment and explain the daily site routines and the actual task they needed to perform.

The hosting workers were told that the managers were going to work with them as an extra pair of hand. They were asked to teach the managers the basic skills required for the job and supervise them during the work execution. The workers were also instructed not to give the boot camp participants any special treatment during the time they spent with them.

ACTUAL WORK IN GEMBA

Each of the managers was allocated a trade during the previous week so that they knew exactly where to go and whom to work with. The boot camp participants first received a safety briefing from the site foreman and were then escorted to the main store to get personal safety equipment and trade specific tools. The managers then joined the work crew and started to work with them.

The managers had to work a full day and do everything the crew did starting with the work itself, taking breaks and cleaning their work place before leaving the site (Figure 2).

Figure 2 – Managers working in Gemba: a) A project manager preparing stone cladding. b) A project manager applying plaster. c) A logistics manager fixing formwork. d) Tidhar's CEO fixing rebar.

To understand the site routine and to learn as many details about the work as possible, the participants spent two full days with the same crew doing the same work. The

managers were instructed not to take any notes during the day (they could do that only during breaks) so the working crews would not feel as if they were being tested. The participants were also asked not to give any suggestions or try to change the way the crews executed their work.

SUMMARY SESSION

At the end of the second Gemba day the group held a three hour summary meeting during which each participant shared his experience and presented two or three case studies regarding wastes (see the One of the risks in a singular event is that once the initial enthusiasm subsides, people tend to go back to their old behavior. To overcome this risk and to maintain persistent organizational tension and management commitment to the process, a set of three meetings was scheduled for the group. The meetings were planned to take place 30, 60 and 90 days after the program finish. In these meetings each participant will have to report his work plan development, which lean tools he used and what was the outcome in his daily work (These meetings were held after the time of writing of this paper).

Results section below). The participants used different visual aids such as actual tools, materials, charts and photographs. One example is shown in Figure 3.

The case studies did not necessarily have a direct connection to the presenter's daily work, but the idea was to spread the observation and findings around the group so others could decide whether to include them in their personal work plans.

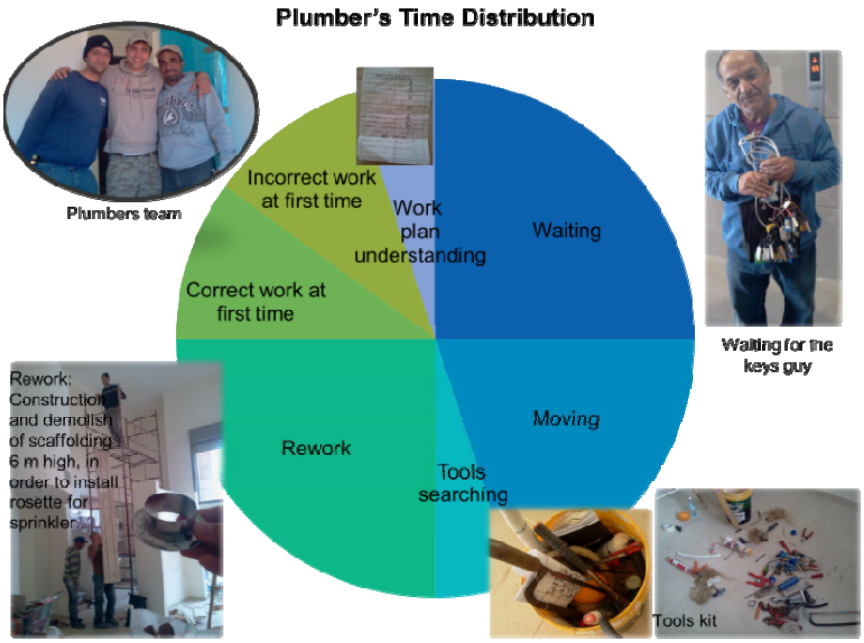

Figure 3 - Example of a Gemba work summary chart.

PREPARING PERSONAL IMPROVEMENT WORK PLANS

In order to tie the experience in the boot camp to everyday work, the participants were required to build an improvement plan in their areas of responsibility, implementing leans tools based on the principles they had learned. The improvement

plan was structured around the A3 methodology, taking into account choosing a topic for improvement, going to the Gemba to see and learn, root cause analysis, testing possible countermeasures and set follow up meetings to check. Each participant had to choose the right lean tool for either investigating the current condition or implementing a new process. Among the tools were VSM, SOE, LPS 5S and others.

MANAGEMENT COMMITMENT FOLLOW-UP MEETINGS

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RESULTS

During the two Gemba days, the ten managers discovered many instances of waste of all types and in all sorts of activities. The following three specific case studies were chosen for review in this paper because they clearly illustrate wastes that can only be identified by the worker preforming the work.

CASE STUDY 1 – STAINLESS STEEL WIRE ROLLS

Tidhar's logistic manager was assigned to work as concrete formworker. One of his activities was to cut lengths of the stainless steel wire that was used to tie the stone cladding to the formwork (Figure 4 left). The first thing he noticed was the wire length -it seemed to be longer than needed. He decided to investigate, and went down to the work station where workers were fixing the cladding to the formwork. There he found out that the stainless wire was delivered in 25kg rolls.

Figure 4 - Stainless steel wire: length of wire used (left). part of the wire roll that wasn't used (right)

The workers cut the rolls into two sections: two thirds and one third (of the circumference). The two-third length could be used; the remaining third was too short, and so was discarded (Figure 4 right). When the worker was asked why he did not cut the roll in two halves, his answer was that the wire would be too short to work with.

The logistic manager wasn't satisfied with the answer so he kept exploring and went to the storage container. The storekeeper told the manager that the stainless steel wire comes in rolls with a diameter of 35cm, which means that half the length is too short. Still looking for the right answer, the logistic manager call the purchase department and there he discovered that the stainless steel wire supplier was changed a few months earlier, and the diameter of the rolls provided by the new supplier is 5cm shorter than the old one. Tidhar buys around 8,000kg of stainless steel wire each year at a cost of around 65,000$. This means that each year the company loses around 20,000$ from throwing away 1/3 of each role.

CASE STUDY 2 – CONCRETE BRICKS PALLETS

The tender and budget department manager was assigned to work as a general worker. During the two days he spent in the Gemba, most of his work was to transport concrete masonry blocks from the storage on the ground floor to the second floor, where the masonry builders were working. The method was taking all the blocks, two at a time, from the pallets (Figure 5 left) to the hoist and then again, taking all the bricks from the hoist to the working area. He thought he could be more efficient by using a small forklift (Figure 5 right) to take the whole pallet to the hoist and later, to the working area. He went down to the storage room to bring the forklift. When he got back and try to use it he realized he couldn't, because the pallet base thickness was 0.5cm too short and the forklift could not go through (the distance between the pallet top and bottom wood boards was 6.5cm and the fork lift minimum height was 7.0cm). Unfortunately, he had to keep transporting the blocks one by one.

In this particular project, most of the concrete block pallets were delivered to each level of the building before the concrete ceiling slabs were cast, using the crane. Miscalculation of the exact number of pallets caused the problem in the first place. Moving the blocks by hand took around 2 hours for one worker (each pallet contains 60 concrete blocks). Using the forklift would have shortened this task to about 15 minutes. Each floor up until the 10th floor needed six extra pallets. Beyond that level the root problem was fixed and the correct number of pallets was inserted. The loss of time was significant: moving the blocks required 120 man-hours, vs. 15 man-hours that would have been needed if the pallets had been delivered to the right floor.

Figure 5 – Concrete blocks on a pallet (left); the manual forklift (right)

CASE STUDY 3 – REVEALING ELECTRICITY OUTLET BOXES

The manager of the tenants' design coordination department was assigned to work as an electrician. His work was to expose the electrical outlet boxes that were placed in

the walls two months earlier. The first step was hitting a nail into the wall where the outlet box was supposed to be according to the plans (Figure 6 left). If the nail hit a cavity, he used the hammer to open a bigger hole by removing the plaster (Figure 6 right). If the nail didn't hit the box he tried to hit a few more places and if that didn't help he used the hammer to remove a big chunk of plaster. After the box was revealed and most of the plaster was removed, another worker came with a utility knife to refine the opening around the box edges.

The supervisor realized that his work was a waste inherent in the process: fixing the outlet boxes, placing plaster, revealing the boxes and fixing the plaster around it, and he climbed a few stories up to find the plaster workers. He then saw that the plaster workers use a machine to spray the plaster onto the wall, after which they use a large steel rule to spread and flatten the plaster layer. The work was coarse and considered only how to apply the plaster in the fastest way possible. In some cases, the electricians placed a piece of wood sticking out of the outlet boxes to mark the box location, but the plaster workers removed them since they interfered with their work. Revealing the electrical outlet boxes took around two hours per apartment and fixing the plaster afterwards another one hour. Tidhar builds approximately 1,500 residential units per year which means a total of 4,500 men hours wasted in the process.

Figure 6 – Revealing electrical outlet boxes: finding the box with a nail (left); removing the plaster around the entire box (right)

PERSONAL EXPERIENCE

During the summary meeting each participant expressed his personal experience throughout the program and especially spending two days in the Gemba. Here are a few quotes:

"The atmosphere and the dialog contributed to the learning experience and allowed deeper understanding"

"I think the program was amazing. I enjoyed it very much. We came, listened to lectures and put on different 'glasses' only to see, a week later, the things we've been seeing, in a different perspective"

"You realize that if you're not in the field, things will never come up. It is part of the respect, if you're in the Gemba, people will relate and follow"

"The Boot Camp program generated a buzz throughout the entire organization"

"It was powerful and overwhelming, like a stone thrown into puddle. The two days we spent in the field were a total blast"

"I was hearing 'lean this' and 'lean that' for a long time and only today can I say that I'm starting to understand the true meaning of it."

CONCLUSIONS

Modern management is mostly based on IT dashboards, reports and charts that result in a decision making process usually performed far away from the place where the actual work is performed. This decision making process mostly lack the proper information that reside in the Gemba needed for that decision. The Boot Camp experience showed that going to the Gemba in building construction is a powerful concept and should be a standard management practice. None of the wastes that were observed had been reported to management and would have remained unidentified if not for the Gemba session. As a practice, managers should train themselves and the people that work with them to go to the Gemba to see, ask why and show respect. The capability to go to the Gemba, to look at a process, to ask the right questions that will make the worker or the foreman think about the problem in a new way, is a genuine skill that is developed over time and practical experience. As in any other practice, the manager should seek to improve himself and others in the way he goes to the Gemba in order to grasp and understand the current situation.

The two days spent by the participants of the Boot Camp in the Gemba, had a ripple effect throughout the company. The fact that managers were "really" interested in the actual work, and were willing to invest time in order to learn about it, made many people in the company feel that their work was really important. Workers and foremen, who were used to working alone, felt empowered by the realization that senior managers were asking sincere questions about how the work is really done.

At the end of the Boot Camp, several managers said that even though they had heard and learned about lean in the past, they had never been able to link it to their daily work. Only after learning to see through the training in the Boot Camp, did they understand the meaning and full potential of continuous improvement and eliminating waste.

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