

STRATEGY DEPLOYMENT USING PDCA CYCLE

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Abstract

PDCA is one of the well-known dynamic models for process improvement among other sets of quality tools and lean management methodology. Each process, product or service, improvement or project could be designed with the help of PDCA cycle. It is a model that can bring value to sets of activities, production or strategic deployment. We aim to show how PDCA can contribute to strategic deployment activity within the lean methodology. PDCA can bring profound insights, learning takeaways and make organizations more lean. Using PDCA in strategic deployment is presented as theoretical example along with practical insights gained from the lean environment.

Keywords: lean, strategy deployment, PDCA cycle

1. INTRODUCTION

Lean management – a methodology that has been around for decades, helps businesses improve their process by eliminating waste in an organization. At the same time, it also demands a continuous improvement culture to sustain good results. Lean is very practical and has been widely recognized as a business process improvement methodology. It gained popularity mainly because of the simple and logical solutions for process improvements. However, this management approach consists of many different tools companies implement, such as Poka-yoke, Value Stream Mapping (VSM), 5S and many other [1]. For implementing these tools, as well as the whole methodology, a proper strategy deployment model is needed. This specific process of strategic management, derives from Japanese management [2].

PDCA is a method used to help in any kind of improvement. The four-step cycle (Plan-Do-Check-Act) is widely used, mostly to improve processes, in new projects or to implement changes in an organization. It is known as a PDCA cycle since it is an iterative method. The value of PDCA is widely recognized both by quality traditions of West and East. It is an obligatory part of every single quality training, the underlying logic of ISO standard and part of lean. PDCA is generic and applied in quality activities in general.

In this article, we will focus on the PDCA cycle in a strategy deployment. First, we will briefly theoretically describe the concepts of lean and PDCA. Following is a detailed analysis of each step of PDCA, where we also present our model for strategy deployment using PDCA. We believe this gives managers a useful method for proper strategy deployment. Our final thoughts are summed up in the conclusion.

2. BACKGROUND ON LEAN AND PDCA

Lean is a term that is used to represent a variety of different ideas. For example, looking at research articles we can find terms like lean production [3], lean manufacturing [4], lean philosophy [5], lean program and

many other. All of these names have an underlying idea of lean - waste removal for process improvement. Looking through the literature, we can conclude lean primarily started as a method used in the manufacturing sector [6], but its application was found useful later on in other industries and even services [7, 8]. It has been proven that using lean methodology improves processes and indicators [9, 10]. The problem that companies face is that results of many specific improvements on the floor level can be difficult to manifest on the strategic level. Lean initiative is cultivated within the narrow quality circles and its results can be easily diminished if they are not translated in efficient and profitable outcomes. Without the support of top management, lean initiatives cannot be implemented with success. Top management is usually supporting lean activities but without the active enrollment and accepting lean culture, the lean results cannot be sustainable.

Hoshin Kanri, also known as policy deployment and management by policy, is a concept used for shaping and following the implementation of a strategy, stemming from the development of widely-known production system - Toyota Production System (TPS). It is a strategic management concept that enables the transfer of vision and business goals to everyone in the organization [11]. It gives clear intentions to higher management, engages all levels on the activities that are a priority for an organization, thus giving it a sense of ownership and control over employees. It can be used for improving overall business capabilities, unifying plans and policies spread out across levels, as well as using main management resources [12]. Four components make up the Hoshin Kanri name [2]: Ho (direction), Shin (focus), Kan (setup) and Ri (reason) – literal translation would be “direct management”.

There are many tools at the disposal of a business under the roof of lean (some of them are 5S, Kaizen, single minute exchange of die - SMED and many other). PDCA cycle is a model that can be used to keep things moving forward, using all these mentioned tools, in the process type of activity.

Created by Walter A. Shewhart and promoted by Deming, there was a story on how PDCA evolved. Shewhart cycle developed as the result of Shewhart's work on studying the processes of improvement. Behind the logic of PDCA is an applied scientific method. The steps are making the hypothesis, checking whether it is correct, reporting on results and finally learning from the whole process. Those steps of scientific method are translated to the business environment, made shorter and simpler in explanation for the sake of using it on a much wider scale of situations and with different employees' background. Original Plan- Do- Study-Act is closer to the main goal, which is to learn and study from mistakes or success. With the version of “Check” the whole model was rounded with control. The whole cycle is about controlling the setting, the conditions and results. Only the third step in the cycle is about realizing what does (not) work and why.

Another alternation is renaming Act to Adjust if it corresponds better with the content of that stage. Act is about implementing learning from stage Check to practice in the next cycle. It could be alternative step in the process, creating new practice that proved to be successful, creating new standards to keep innovative solutions. Therefore, it could make sense to change the name.

A more modern approach is to add another step: Observe. Before even starting the Plan step it is important to be familiar with the current situation. Following this recommendation, we named this step Pre-phase. We will go into more detail on this step in the following section of this article.

Additional changes to the original PDCA were suggested, such as incorporating another cycle within the Do step (problem finding, display, clear, acknowledge) as a suggestion by Bulsuk [13]. However, they did not find public approval of their innovative improvements of the PDCA.

Apart from production and business in general, other areas of work can greatly benefit from this tool [14]. Not only leaders and managers, but employees may also apply it for their issues. Additionally, PDCA cycle could be employed when starting a new improvement project; when developing a new or improved design of a process; when defining a repetitive work process; and when implementing any change [15, 16]. Moreover, we claim PDCA could be used for a more complex organizational process like strategy deployment.

3. USING PDCA FOR STRATEGY DEPLOYMENT

Our proposal of the process of developing strategy is as follows: there are five stages of the PDCA cycle to be completed. The typical PDCA is enriched with an additional pre-phase. Each of the phases will be described separately. In Figure 1 we present the graphical form of using PDCA in strategy deployment.

PRE-PHASE is viewed as separate from the Plan phase since this is the initial analysis done by a company for the first time. To emphasise this, the pre-phase is considered a separate phase from Plan. It is important in this stage to make the initial introductory training for managers about the specific processes of strategic management and basics of lean management. This introduction is key since higher management ensures the support for any further activities regarding the newly implemented tools.

The Pre-phase also consists of business analysis, where a company must do a strategic audit, company analysis and environmental analysis. This is done by the management team. Different tools, methods and approaches taken from strategic management can be used to analyse the current state of the business and its environment. It is important not to overburden the top management with too many tools, rather choose the ones that proved to be beneficial and able to provide different perspectives from the environment and within the company and translate them to new strategic insights. This is the framework for top managers and they are the responsible party for this stage of strategy deployment.

Following the pre-phase we begin with the original PDCA cycle. PLAN phase is initiated by the management team. It consists of building a SWOT analysis (we gathered data for this in the previous phase), revising the mission, vision, values and policies of the organization if necessary and forming a TOWS matrix. TOWS matrix is usually ignored because of the conception that it represents almost the same content as SWOT. It is important to realise that SWOT enables a divergent type of thinking, opening space for discussion while TOWS matrix redirects toward convergent type of thinking and brings the focus on the goals and strategic insights. TOWS matrix helps us in using the data and discoveries from the SWOT to efficiently build a strategy. There are suggestions for each of the SO, ST, WO, WT strategies. The output of SWOT analysis and TOWS matrix are strategic directions. They are the base for middle-term plans, annual and operational plans. The long term plans are slowly retiring and not in use anymore. Long-term plans serve as an exercise for strategic thinking, imagining how the future might look like and what options we should be prepared for. They are vague frameworks of paradoxical ideas and creative perspectives. Up to this point all plans are defined by the management team, but they invite input from the operational management team, team leader and whole operational team in the catchball process. The catchball process is the element that could be found in Hoshin Kanri and lean. The point is that plans are set in coordination with different hierarchy levels, discussing them and arguing about the content of the plan. In this way a plan is set more realistically. The results of this is that the set percentage of successful implementation is much higher than in traditional strategic planning sessions. The number of iterations and levels of hierarchy involved and the sequence of catchball vary depending on the industry, experience of the top management and employees. This activity is good for employee motivation, engaging and empowering them to create plans for the future of the company together with the top management. Devised plans are then set at the corporate level and included in the Profit & Loss statement. Except for TOWS, another useful element in the Plan phase is overviewing current key problems and opportunities for improvement on the principle of theory of constraints (TOC). This theory helps identify the current bottlenecks of the company - the main problem that has the most effect on the operations. It is very important to use adequate tools for data analysis, such as Pareto diagrams and cause-and-effect diagrams.

DO - As the name suggests, this is the implementation phase. The Do phase includes the management team, operational management team, team leader and project leader, but also all employees. After deciding on the plans on all managerial levels, it is time for the actual development of operational plans and projects, followed by their implementation. There is a whole variety of action and project plans, and the main intent is to elaborate activities down to task level, including delegating responsibilities, defining the timeline and measurement systems. It is important to come up with an adequate measurement system for the plans to keep track of their realisation. The measurements should be defined clearly, with adequate measures (depending on the nature of the goal, for example, percentages, number of products, days). Also, it is recommended to put a time limit inside the measure to have a clear target value and the date by which they must be completed.

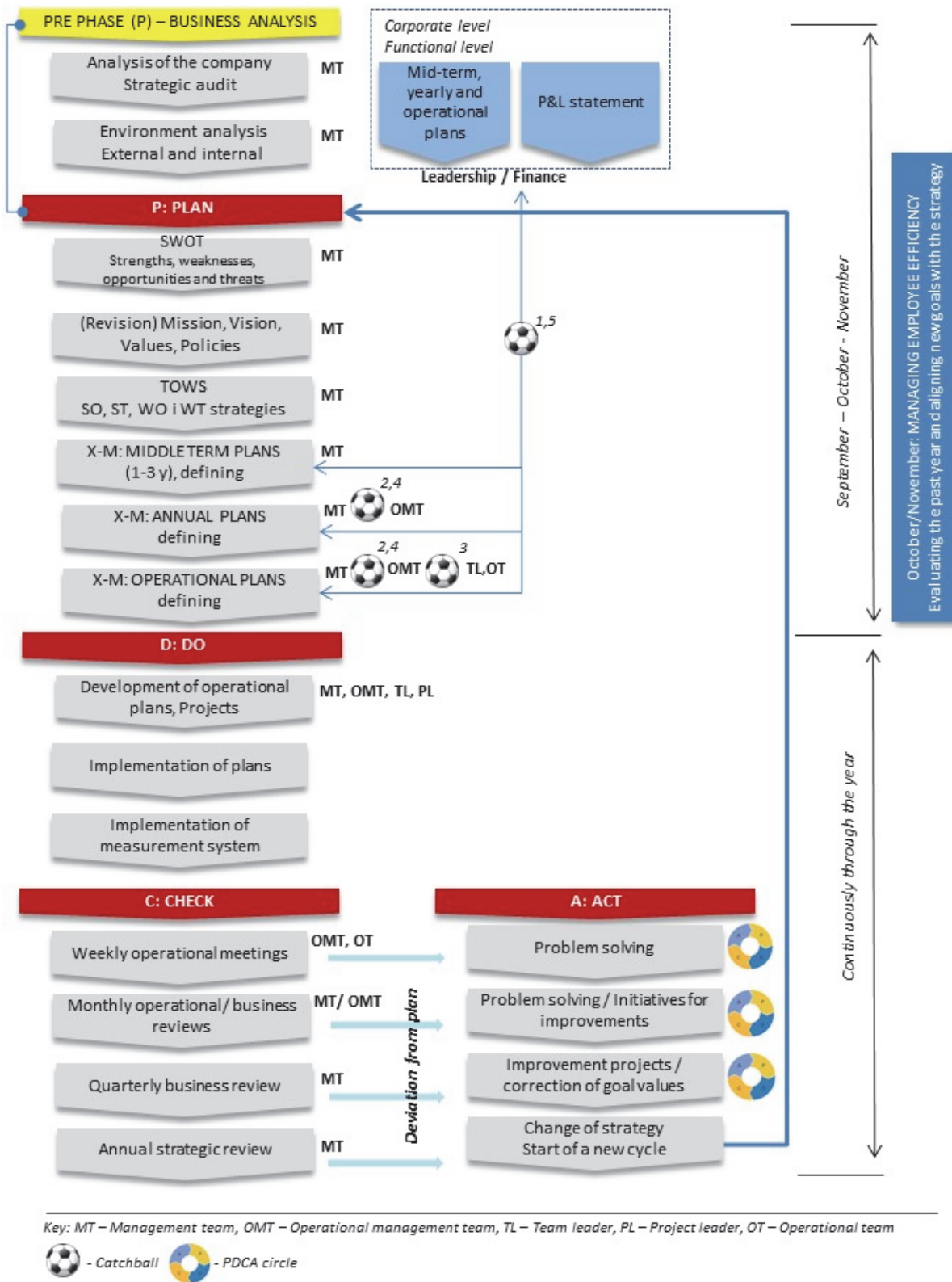


Figure 1 - Developing strategy by using PDCA (Source: Manos, 2010; Hutchins, 2008, p.10; Jackson, 2006, p. 2; Hines, 2011, p. 9; Wheelen and Hunger, 2012, p. 15 as cited in Lerner [17])

Another aspect is that the development of operational plans is actually a mini activity of planning and it is not mistakenly put in this phase. A multilayer story of PDCA incorporates a small PDCA within each stage. Therefore, the development of operational plans has a small portion of planning within the stage of Do. This

phase is not about creating plans, but mainly implementing them. The management mantra “employees support what they help to create” is taken seriously and time invested in creating plans along with employees pays off in this phase. Employees understand the strategic goals, plans and methods since they took part in planning sessions and are now eager to implement them in reality.

Effective communication with all employees about set plans is another important aspect of this phase besides the measurement system. Managers must ensure that employees understand their role in achieving strategic goals. The key activity is a communication plan. It consists of information about the key message (business strategies, roles of employees), responsible employees, targeted audience and plan efficiency tracking. There is also a variety of communication methods and tools - visual ones are most used, widely available and most often updated. Examples of such tools are the A3 plan, different graphs, etc. Based on information gathered with the help of these tools and methods we can build an X-matrix (a version of an A3 plan) to start strategy deployment. This matrix is the central document of the Hoshin Kanri concept. It is a document that helps to frame all needed activities on all hierarchical and strategic levels, KPI's, timeframes and people involved in the project. It also clearly shows their correlations. Goal of the communication is to give managerial support to employees so they feel free to express problems, obstacles and even opportunities or success of the implemented activities. Instant feedback, report and info could make a difference in outputs.

The CHECK phase follows the implementation and is directly interwoven with the Act phase. At this stage we check the activity and strategic plan implementation on all levels, systematically and timely. Four main activities make up the Check phase, and these are weekly operational meetings (including operational management team and operational team) that deal with problem-solving; monthly operational/business reviews (done by the management team and operational management team) also doing problem-solving and offering initiatives for improvement; quarterly business reviews (involving only management teams) that do improvement projects and correct goal values if necessary and annual strategic review (also done by the management team) that change the strategy if necessary and starts a new cycle. It is strongly recommended that each level have their range of obligations to generate and comment on the report. Reports are provided in a daily, weekly, monthly, quarterly and annual rhythm. In recent times, the reports are not written per se but generated automatically via ERP solutions and different IT solutions. It is not just about providing reports but giving suggestions for improvements, resolving problems, correcting activities and owning a problem according to the range of responsibilities and authority. The reports are usually as simple as possible and in a standardized format.

The final phase of PDCA cycle is the ACT phase. We strongly believe that Check and Act phase should be strongly connected. Check phase includes inspecting whether the results are according to plan and the goals are met. If that is the case, this current state of operations is solidified with standardization of the new ways of work, new internal rules or technical specifications. On the other hand, if the activities and results are not satisfactory, the organization has to take corrective steps. This final phase of PDCA is the phase of problem-solving and learning - both from good results and from failure.

The problems may arise in different parts of the organization. Based on the problem type and source, an organization decides on ways to solve it. In our case, implementing lean brings also good methods and tools for problem-solving and analysis, such as Pareto, Ishikawa, 5 Why and similar. The point of this stage is to select the type of activity and time horizon upon which a problem should be resolved. There is no point to bring a simple operational problem to the strategic table to discuss annually. It should be resolved on lower levels and in a timely manner.

Problems identified on weekly meetings are operational and ought to be resolved in a short period. If the problems are identified on a monthly basis, they are settled with new initiatives for improvement or DMAIC method. Problems that appear in quarterly checkups are resolved with new projects for improvements or also with DMAIC method. Another option may be adjusting the goals in a way that the expectations are more realistic. Identifying problems on a yearly basis also means analysing the current state of a business, taking into consideration external and internal changes in environment which brings (starts) a new PDCA cycle of the strategic deployment.

4. PROCESSES BEHIND PDCA CYCLE

PDCA cycle represents an intersection between the scientific method and everyday practice. It can be used in every situation where you have a process and a goal to accomplish.

The most common way of explaining how to use PDCA is by mentioning that it is all about experimenting and testing. It is wrongly understood that experimenting with PDCA means applying it on a smaller scale, on one process, on one product, or just testing new project and its feasibility. It means that the whole process, the project or product will be created or conducted by using PDCA. Moreover, it also does not mean that we will use a section of production to use PDCA on and for all other parts of the production we will not employ PDCA. Additionally, creating a hypothesis does not mean contemplating activities without real action following afterwards. PDCA is urging for action and concrete activities in practice.

One of the elements of strategy deployment – catchball, is extremely important for communication purposes. Empowering employees to participate in strategy deployment will motivate them to perform towards strategic goals and be willing to invest the extra mile for the cause.

Shorter cycles of reports enable quick response, change and adjustments toward the environmental needs, demands or market disruptions. There is no time for reporting. Standardized forms are given to focus more on work and less on paperwork and administration of the process. Industry 4.0 promotes IT solutions that enable prompt reporting, automatic and in real-time signalling any deviation from plan.

The idea behind the PDCA is that it is a cycle by nature - after performing one circle nobody goes back to the starting point and repeats the process all over again. Doing this exercise all the participants gain some experience, knowledge, make some mistakes. Some lessons are learned, participants gain some success and they transform themselves in the process. Therefore, the end of the circle brings them to a new level of understanding and new starting point for the next circle. Due to the iterations and changes, the circle takes the shape of the cycle, sometimes referred to as spirals.

No matter how simple it might look like, this helps exercise improvements and trains for learning. The whole cycle has the intention of learning by observing, testing and correcting undesirable outcomes. There are two levels of learning that the PDCA cycle is promoting:

- 1) Learning by repeating the cycles one after another. As soon as the first cycle ends, the learning output of the previous cycle starts to be the input for the next one. Sometimes PDCA cycles last one project, one process, one day, one month or one year. The duration depends on the type of process. The experience transfers to learning and goes back to practice.
- 2) Learning by repeating the cycle one within the other. Within the first stage of planning, there could be even more granulated, smaller PDCA cycle. Plans could be chopped into activities like resource plans for planning, planning itself, testing the planning and learning how to improve the plans. Furthermore, the *Do* phase can have a PDCA cycle within itself. It goes on for all other steps of the PDCA cycle. In this way, a complex task is fragmented into steps and sections that are easier to manage, implement or perform.

5. CONCLUSION

In this paper, we presented the PDCA cycle, a method to help manage strategy deployment in an organization. PDCA cycle is a simple, yet valuable model for continuous improvement in an organization. The simple steps are used to create successful new projects, ideas and improvements in an organization. This paper presents the practical usage of PDCA. Specifically, we show example of the strategy deployment model in a imaginary company using primary PDCA. We conclude PDCA is a useful method for creating both new projects, learning from old ones and creating a never-ending loop for continuous improvement. PDCA is a good impetus for learning and improving.

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