

Transforming Deming's Cycle to a Growth Cycle

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Abstract

This research addresses the transformation of Deming's quality improvement cycle to establish a holistic Growth Cycle. While Deming's Plan-Do-Check-Act (PDCA) Cycle has been foundational in continuous improvement and quality management of products and processes, its action-based structure does not identify the key roles needed to perform the cycle actions nor the continual growth potential of those performing each role. A modern derivative of Deming's PDCA Cycle, the Observe-Plan-Do-Study-Act (OPDSA) Cycle, is transformed into the Growth Cycle through identification and focus on the key roles played within each of the OPDSA stages. These roles are the Coach for the Observe stage, Scriptwriter for Plan, Performer for Do, Guide for Study, and Director for the Act stage. The resulting Growth Cycle presents a role-based and more comprehensive holistic framework which not only focuses on the improvement of the product or process, but also explicitly accounts for continuous improvement and growth in the capabilities of those engaged in the cycle. Due to its role-based approach, the Growth Cycle could prove instrumental in human development and growth contexts ranging from the personal to the organizational.

Introduction

In 1939, Walter Shewhart applied statistical quality control methods with his Specification-Production-Inspection (SPI) Cycle for process and product quality improvement (Shewhart, 1939). Building on the SPI Cycle, Dr. W. Edwards Deming introduced the initial form of the PDCA (Plan-Do-Check-Act) Cycle during his 1950 lecture in Japan (Deming, 1986, 1993; Best & Neuhauser, 2005; Sahnó & Shevtshenko, 2014). The Japanese implementation of the *Deming Wheel* led to the Plan-Do-Check-Action or PDCA Cycle in its current form (Moen & Norman, 2009). Additional improvement efforts to the PDCA Deming Cycle resulted in the addition of Observe as a fifth component at the beginning of the cycle, giving rise to the OPDCA Cycle (Knop & Mielczarek, 2015; Roy & Ghose, 2016; Gandhi et al., 2020). The addition of the Observe component necessitates thoughtful consideration of the current conditions prior to creating a plan during the plan component of the cycle.

Since its introduction, Deming's Cycle and its derivatives have continued to provide a logical and systematic approach to quality improvement in product, process, and system development (Reid, 2001; Jagusiak-Kocik, 2017; Realyvásquez-Vargas et al., 2018; Chojnacka-Komorowska & Kochaniec, 2019; Isniah et al., 2020). Furthermore, due to its versatility, Deming's Cycle has been instrumental in shaping the landscape of quality management and continuous improvement across diverse sectors (Reid & Chesterson, 2001; Roy & Ghose, 2016; Dudin et al., 2015; da Silva Fernandes et al., 2023; Chen et al., 2022; Hii et al., 2024).

Despite its widespread adoption and proven efficacy in organizational quality improvement, Deming's Cycle has not yet been applied to higher levels of continuous improvement. When incorporating individuals into the OPDCA Cycle, the process can foster not only organizational growth, but also the personal growth of these individuals. By examining the roles the individuals adopt during each stage of the OPDCA Cycle and the continuous development needed for improving actions within each component, Deming's Cycle is transformed into a Growth Cycle. The resulting Growth Cycle can be used to facilitate a culture of strategic reflection, intentional growth, and agile adaptation for achieving personal and organizational transformation.

A brief history of the development of Deming's Cycle is presented, followed by a discussion of the transformation of Deming's Cycle into the Growth Cycle. After this, the roles individuals play during each of the stages of the cycle are examined. This includes highlighting the distinct outcomes expected from the individuals at the end of that same stage in the cycle. Finally, overlap in the actions that some roles utilize are investigated, with examples provided, followed by final thoughts and conclusions.

Deming's Cycle

The PDCA Cycle, initiated by Walter Shewhart in 1939, implemented in Japan as Deming's Wheel in 1950, and introduced by Deming to the USA in 1986, is illustrated in Figure 1. The capability and versatility of the PDCA Cycle in facilitating quality improvements and operational

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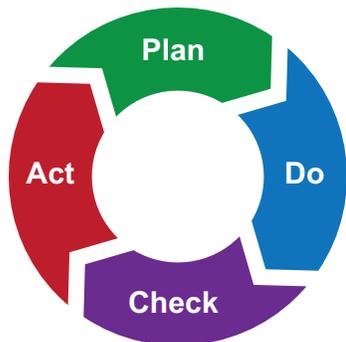
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excellence has inspired its adaptation across multiple industries (Moen & Norman, 2009).

Figure 1 Deming's PDCA Cycle



As depicted in Figure 1, Deming's Cycle is composed of four action-oriented stages. The first, Plan, is used to define the problem, suggest probable causes, and identify potential solutions. The second stage, Do, requires implementing or *doing* the proposed solution. The third stage, Check, entails an evaluation of the results. The fourth stage, Act, involves acting on the results of the evaluation. If the results are satisfactory, the process is standardized; if the results are unsatisfactory, adjustments are recommended, and the cycle starts again with the Plan stage (Moen & Norman, 2009).

Different versions of the PDCA Cycle have been created. For example, as a revised alternative of the PDCA Cycle, the PDSA Cycle, depicted in Figure 2, was introduced by Deming in 1993 (Moen & Norman, 2009), and later refined by Langley, Nolan, and Nolan (1994). Deming described the PDSA Cycle as both a flow diagram for learning and a means to improve a process or product (Moen & Norman, 2009). Replacing the action-oriented component Check with Study stresses the importance of reflection, building knowledge, and generating insights for continuous improvement.

Figure 2 Deming's PDSA Cycle



In a similar vein, the Toyota corporation expanded on Deming's PDCA Cycle to create the Toyota Production System, incorporating an Observe action stage at the

beginning of the PDCA Cycle. The resulting OPDCA Cycle emphasizes that a *go and see* action needs to occur to ensure that there is an understanding of the existing situation before the planning component of the cycle occurs (Rother, 2009; Javanmardi et al., 2023). The revised "Observe-Plan-Do-Check-Act" (OPDCA) Cycle is shown in Figure 3.

Figure 3 OPDCA Cycle



In this article, the PDSA Cycle presented in Figure 2 is combined with the OPDCA Cycle presented in Figure 3 to transform Deming's Cycle into the Growth Cycle. As with the earlier shift from Check in PDCA to Study in PDSA, the same may be done here, yielding the iterative five action-oriented stages of the Observe-Plan-Do-Study-Act (OPDSA) Cycle displayed in Figure 4.

Figure 4 OPDSA Cycle



Volakli et al. (2023) discuss how the OPDSA Cycle was used to facilitate actions in a Greek Pediatric Intensive Care Unit (PICU) to improve process and outcome indicators during a four-year cohort study (2017–2020). While Volakli et al. (2023) document improvements in the PICU's process and outcomes, improvements were not tracked for the individuals assigned the roles of observing, planning, doing, studying, and acting. Through tracking and facilitating the improvement of these individuals, the resulting quality improvement cycle would have become a more comprehensive and holistic, organizational growth cycle, focusing not only on the improvement of the process and outcomes but also accounting for the continuous improvement and growth in the capabilities of those engaged in the cycle.

This focus on the actions that need to be taken during each stage, independent of the individual responsible for acting, is a key issue with Deming's PDCA and PDSA Cycles, as well as its other derivatives, because this focus ignores the individual's capability and needed growth during the decision-making stage of the cycle. In fact, the action-based structure of Deming's Cycle does not identify the specific role needed for each action nor does it identify any of the key characteristics associated with each role to achieve the desired quality improvement outcomes.

The Growth Cycle

To address these limitations, the cycle needs to be transformed to include the roles that individuals play within the cycle. The resulting Growth Cycle should specify and emphasize the key role associated with each action. Burke et al. (2024) describe five roles for growth planning that align with these action-based stages: Coach, Scriptwriter, Performer, Guide, and Director. These roles are chosen to focus on the desired outcomes that each individual should achieve at every stage of the cycle as displayed in Figure 5.

Figure 5 Growth Cycle



Considering personal growth as an example, following the role-based Growth Cycle depicted in Figure 5, the individual would adopt the role of a Coach during the Observe stage. The Coach ensures there is a meaningful continued alignment with the identified goals and intentions utilizing their experience-based understanding of the current and desired state. During the Plan action-oriented component of the cycle, the individual adopts the role of Scriptwriter, skillfully crafting detailed and timely scripts that translate strategic intentions and objectives into actionable tasks. This stage of the cycle is followed by Do, where the individual becomes a performer. The performer executes the script, translating strategic intentions into focused actions that contribute to established objectives. The Study stage follows, where the individual acts as a Guide with responsibility for providing clarity through studying the results of the performance, reflecting, and offering insights that

may produce new desired goals which require updating the strategic intentions. To close the cycle, the individual adopts the role of Director during the Act stage. The director translates and directs the Guide's vision into strategic intentions and priorities, ensuring achievement of the desired goals. These goals are then taken by the Coach, who begins the cycle anew—a result of the individual's mindset of continuous quality improvement.

During each action-oriented stage of the Growth Cycle, the individual produces distinct outcomes, which are indicated between the arrows of Figure 5. The Coach provides strategic and developmental strategies to achieve the identified goals and intentions. The Scriptwriter creates a script to enact the strategy. This script is then performed by the Performer with the results of the performance generating data. The Guide studies this data to create insights about improving performance. The Director utilizes these insights to generate new intentions as well as process and performance goals which are then utilized by the Coach to restart the continued growth process once again.

By identifying the roles and desired outcomes, both personal and organizational growth can be addressed since a single person can work through the cycle, or separate individuals within an organization can each assume a particular role in the cycle. This also provides the flexibility needed to start the cycle with the most critical role, depending on the situation and the expertise of the individual(s) involved.

Tracking personal growth by conducting a weekly transition is an example of a single individual assuming all roles in the Growth Cycle (Burke et al., 2024). The weekly transition has the individual begin the cycle in the role of Guide, reflecting on the results of the previous week. For organizations with multiple individuals working within different stage in the cycle, entrance into the cycle can vary. For example, if the previously referenced PICU study (Volakli et al., 2023) had followed the Growth Cycle (instead of an OPDSA Cycle), its beginning would have been with the role of Coach—an individual or individuals who would have observed to detect initial baseline values of the indicators chosen before planning the necessary actions for further improvement.

Role interactions and overlap

While the Growth Cycle identifies distinct roles and outcomes, there is overlap in some of the actions performed by these roles during their respective stage of the cycle. For example, actions in the Coach role overlap with those of the Scriptwriter, Guide, and Director. While the Coach and Scriptwriter both work on planning, the Coach's

strategies are translated into actionable steps by the Scriptwriter. And while the Guide and Coach roles both focus on continuous improvement and growth, the Guide provides insights while the Coach provides strategic and developmental strategies to implement the intentions and goals the Director has generated from the insights. Further, while both the Coach and Director ensure alignment with strategic objectives, the Director generates goals and intentions while the Coach creates strategies. The role of Director also overlaps with that of the Scriptwriter. While they both share planning, the Director provides strategic priorities, and the Scriptwriter turns them into detailed action plans.

These overlapping and interconnected relationships ensure that each role remains distinct yet works together harmoniously, providing a comprehensive approach to continued improvement and growth. In addition, the overlap provides the flexibility needed to overcome the challenging issues arising from the sequential nature of the Deming Cycle (Platje & Wadman, 1998). Thus, the Growth Cycle presents a role-based, more holistic, and comprehensive alternative framework for quality improvement that includes the growth of the individuals working through the Deming Cycle. In addition to continuous improvement and quality management of products and processes, the role-based Growth Cycle could also be useful in various human development contexts ranging from personal to organizational growth.

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Conclusions

Deming's Cycle and its derivatives have continued to provide a versatile approach to the actions needed for continuous improvement in product, process, and system development. It has been significant in shaping the landscape of quality improvement and management across many diverse sectors.

Despite its success, prevalent adoption, and proven efficacy, Deming's Cycle has not been used to its full potential. The transformation of the Deming Cycle into a role-based Growth Cycle accounts for the growth of the individual(s) engaged in the cycle by specifying the main role for each action-oriented stage in Deming's Cycle, while also focusing on the key desired outcomes within each stage. Thus, the role-based Growth Cycle facilitates continuous improvement and quality management of products and processes. However, by including the continuous improvement of the individual(s) in their roles, it will foster both organizational as well as personal growth of the individual(s) involved.

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