

## **Continuous Process Improvement as a Function of Program Management<sup>1</sup>**

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Continuous Process Improvement (CPI) is the process of improving processes. While a somewhat esoteric definition, the reality is that CPI is ubiquitous throughout industry and is necessary to improve the manner in which a company develops and implements processes (Eaton, 2013; Carleton, 2016). A robust CPI program can result in overall improvements in the efficiency and effectiveness of both existing and emerging processes, thereby helping to streamline the overall production process, to include the critical path (Eaton, 2013; Carleton, 2016).

Continuous Process Improvement (CPI) also refers to the management effort of improving organizations via a focus on customer satisfaction as a function of organizational effectiveness and efficiency (Eaton, 2013; Carleton, 2016). CPI is not difficult to reconcile within existing practices of program management, as it is now considered mainstream and is therefore commonly accepted as a facet of program management. Indeed, the Project Management Institute (PMI) lists it as a process within the discipline of program management (PMI, 2013). Six Sigma, Lean, Total Quality Management (TQM), International Organization for Standardization (ISO), and Agile techniques all have their established places in program management (Sanchez & Blanco, 2014).

Paradoxically, CPI is both hundreds, if not thousands, of years old and also an emergent trend in program management (Eaton, 2013). CPI includes a philosophy of continually improving one's processes for production, which is apparent in ancient weapon and pottery production processes (Eaton, 2013). It is also evident in the more recent example of the commonly accepted birth of Lean, the Venetian galley production process in the 16<sup>th</sup> century. By utilizing Lean concepts such as "standardized processes and interchangeable parts" (Eaton, 2013, p. 4), the Venetians could produce a high-quality, low-cost galley in as little as an hour (Eaton, 2013). In the last 50 years, the Toyota Production System and Motorola's manufacturing arm showed similar results regarding cost and quality (Carleton, 2016).

As well as being an ancient philosophy, CPI is an emerging trend in program management, only receiving broad acclaim in the last 50 years (Vanwersch et al., 2016). Modern CPI can trace its roots to the work of Shewhart in the 1920's and his work regarding controls and statistical analysis of systems (Eaton, 2013). However, it was not until Deming and his work with Japanese industry in the 1950s that CPI gained notoriety following the Japanese industrial explosion centered around lower costs and higher quality (Carleton, 2016). Even more recently, CPI techniques such as Just-in-Time (1970s), International Organization for Standardization (ISO) 9000 (1980s), Six Sigma (1980s), Total Quality Management (TQM) (1980s), Lean (1990s), and Agile (1990s) are still currently being adopted and adapted by program managers across all industries (Eaton, 2013; Carleton, 2016; Sanchez & Blanco, 2014).

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## **CPI's Emergence, Relevance, and Importance**

The major CPI initiatives include Just-in-Time (JIT), Six Sigma, Total Quality Management (TQM), Lean, ISO, and Agile (Sanchez & Blanco, 2014). All six of these methodologies existed for some time before being thoroughly vetted and defined. As previously discussed, the Venetians instituted Lean methods in the 16<sup>th</sup> century. Six Sigma practices can be traced to Shewhart's work with control charts in the 1920s. In short, all six of these now mainstream methods can be traced back decades, which is why the more recent emergence of formal methodologies in the last 30 years is paradoxical.

Even if the methods existed previously, it was not until the late 1970s that these systems were codified and instituted at a global level. Along with a substantial shift towards efficiency and quality in the manufacturing industry, CPI as a philosophy hit its stride in the 1980s (Sanchez & Blanco, 2014). Since then, CPI has been included in every major program and project management instructional course (Vanwersch et al., 2016). It is now a part of health care initiatives, the service industry, and mainstream to the point that the Environmental Protection Agency recently stood up an office of continuous improvement (Environmental Protection Agency, 2018).

In any case, CPI's emergence and relevance is, like the methodology itself, a continually evolving mechanism. New methods are introduced continuously, such as Lean Six Sigma being introduced as late as 2001. Tweaks to the Agile process were released in 2011 (Vanwersch et al., 2016). All six primary methods of CPI are undergoing the CPI process, enabling more specific and effective practices, in addition to a near-constant emergence cycle.

CPI champions and practitioners can encounter problems when implementing CPI programs, however. PMI (2013) recommends initiating a small program or project within a company built around program management standard practices, to include CPI, in order to demonstrate general effectiveness to the workforce to garner buy-in. This recommendation is in direct response to one of the most significant hurdles facing a CPI champion- the tendency of workers and management to focus on deliverables and production statistics as Key Performance Indicators to the exclusion of general process improvement (PMI, 2013; PMI, 2016). In other words, it can be difficult for a line worker to spend time brainstorming ways to improve the production line when their quota for the day must be filled and their time is therefore spent filling said quota. A manager may not want to devote precious time resources to instituting a CPI program, especially if a program is faltering. Ironically, a robust CPI methodology could be precisely the initiative needed to turn a program around (PMI, 2013; Vanwersch et al., 2016).

CPI's importance is difficult to overestimate. The Japanese production explosion of the post-World War II era speaks volumes to the ability of CPI principles to transform an industry (Eaton, 2013). More recently, it is nearly impossible to describe a Fortune 500 company that does not engage in some form of CPI (Sanchez & Blanco, 2014). At its most basic, CPI is a formal methodology by which to improve a system continuously. Few, if any, companies can afford to disregard so basic and obvious a premise (Sanchez & Blanco, 2014).

## **CPI's Centers of Excellence and Proponents**

As for centers of excellence, one can examine certifying bodies as centers of excellence, as they generally maintain the latest standards and developments in the particular CPI methodology. The Scrum Alliance and the Project Management Institute (PMI) are respected certifying bodies in the field of Agile (Project Management Institute, 2013; Navdeep, 2016). However, a simple web search located more than ten additional certifying authorities in the field, including Villanova University. Agile proponents include International Business Machines (IBM) and Microsoft (PMI, 2017).

This student found similar results for Six Sigma, with the American Society for Quality (ASQ) and the International Association for Six Sigma Certification (IASSC) generally recognized as respected certifying bodies (Desai, 2016). The Association for Manufacturing Excellence (AME) is a leading Lean certifying body and knowledge repository; however, Lean has recently been identified as a complement to Six Sigma, and it is, therefore, most often seen as a Lean Six Sigma certification (Sanchez & Blanco, 2014). Lean Six Sigma proponents include Johnson & Johnson and Texas Instruments (Carleton, 2016). The ROI for Six Sigma is variable, but the most famous examples include Motorola, Honeywell, and GE. Motorola reported more than \$17 Billion in total savings, Honeywell reports more than \$800 million in total savings, and GE reports more than \$2.5 billion in annual savings (Carleton, 2016).

ISO methodology has a distinct center of excellence in the International Organization for Standardization, headquartered in Geneva, Switzerland (ISO, 2018). This organization maintains the most current body of knowledge. Proponents include numerous Fortune 500 companies such as Coca-Cola (ISO, 2018). The ROI for ISO is complicated, given that many contractors require it as a prerequisite to bid (Sanchez & Blanco, 2014). Since ISO is a quality management tool, the apparent return on investment comes in the form of reduced defects, reduced re-work, and other similar metrics, which are similar to Lean and Six Sigma metrics. TQM would also fall into this category.

Total Quality Management and JIT methodology still exist but have generally been absorbed into the ISO 9000 series and Lean Six Sigma approaches for all practical purposes (Carleton, 2016; ISO, 2018). In fact, one could not locate a central body of knowledge custodian nor independent proponents for either TQM or JIT. As such, these approaches to CPI are now relegated to being aspects of a parent methodology rather than independent methods.

## **Conclusion**

CPI as a philosophy is thousands of years old. However, given the globalization, formalization, and standardization of processes governing manufacturing, healthcare, IT, and nearly every other major industry, it is now seen as mandatory in program management practice (Eaton, 2013; Carleton, 2016; Sanchez & Blanco, 2014). Indeed, CPI has become a science unto itself, with centers of excellence and certifying bodies specific to each of the primary methodologies. The modern program manager must adopt CPI principles in all aspects of a program, according to PMI (2013). Without a process to continually and incrementally improve, one cannot expect to stay competitive in a global market (Sanchez & Blanco, 2014). Thus, CPI is not only an emerging and

relevant field; its implementation must be of the utmost importance to the prudent program manager.

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