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Process Intelligence:
Six Tenets of Intelligent
Process Improvement

Introduction

The Westfield Sydney to Melbourne Ultramarathon was first run in 1983. At a distance of 875 kilometers, it was going to be one of the most challenging ultramarathons in the world. Most entrants knew that to be competitive, they would need to run 18 hours each day, while sleeping only six hours.

A 61-year-old man named Cliff Young showed up to run the race wearing worn-down overalls and worn-in work boots. When asked if he had ever run in a marathon before, he replied, "See, I grew up on a farm where we couldn't afford horses or tractors, and the whole time I was growing up, whenever the storms would roll in, I'd have to go out and round up the sheep. We had 2,000 sheep on 2,000 acres. Sometimes I would have to run those sheep for two or three days." The runners all laughed. Young was clearly not up to the standard of these world-class athletes.

Amazingly, though, the 61-year-old underdog won the race, beating the record for similar races by 40 percent, or almost two full days![1] How was this possible? Young didn't "know" what everyone else knew—that he had to sleep—so he just shuffled along each night at a slower pace while all of the pro runners dreamt soundly. His win catapulted him to fame in Australia—the race thereafter was named the Cliff Young 6-Day Australia Marathon—and launched a new era of ultramarathon running. Now that world-class runners "know" that it's possible to run days at a time without sleep and that they can conserve energy by adopting an easy shuffle jog, they have a new way of approaching ultramarathons.

Business process improvement today is in a similar state as ultramarathons were before Young's feat — people often "know" which process improvement methodologies work, and they approach those methodologies the same as they have for decades. Yet despite those decades of history to learn from, companies are still struggling to realize success from their process improvement efforts.[2]

Why do some process improvement efforts succeed and others do not? This paper outlines six tenets to help companies think beyond what is currently "known" and bring more "intelligence" to process improvement.

[1] "The Legend of Cliff Young: The 61 Year Old Farmer Who Won the World's Toughest Race,"
 Elite Feet for Runners, December 30, 2007, http://www.elitefeet.com/the-legend-of-cliff-young.
[2] "3rd Biennial PEX Network Report: State of the Industry, Trends and Success Factors in Business Process Excellence,"
 PEX Network, Fall 2013, http://www.processexcellencenetwork.com/downloadContent.cfm?ID=1697.

Tenet #1: Challenge conventional wisdom

Many organizations are constrained by conventional wisdom, much like the world-class runners in Australia. For example, one increasingly accepted "truth" in process improvement is that Lean Six Sigma is a fad with limited applicability and success. Companies that adhere to this belief may take a flexible approach to process improvement, allowing teams to pick and choose methodologies and toolsets.

But isn't flexibility a good thing? Not necessarily. An inconsistent approach waters down process improvement's effectiveness. On the other hand, consistency in process improvement, surprisingly, can bring Cliff Young-like benefits. Companies that stick with a demonstrated and time-tested approach realize an average of 40 percent more benefit than those that don't.[3]

A demonstrated and time-tested approach to process includes the following five steps:

• Clarify the problem and set a goal for improvement.
• Measure performance levels today.
• Uncover the root causes of the problem.
• Figure out ways to address those root causes.
• Make it stick.

These steps happen to be the same logical and time-tested approach employed by Lean Six Sigma, currently the most widely used methodology in the process improvement tool kit.[4] It's also quite flexible, as it can be applied to a variety of problems of various sizes. The five steps can be completed in a few hours with smaller problems or in several months for bigger problems.

Whether an organization uses the DMAIC nomenclature (the acronym for the five Lean Six Sigma phases: Define, Measure, Analyze, Improve, and Control) or a name more customized to its culture, it's an "intelligent" approach that has been shown to be effective and efficient in problem solving.

[3] LSS Aberdeen Six Sigma Report
[4] Op cit, 3rd Biennial PEX Network Report

Tenet #2: Stretch beyond process mapping

Another commonly accepted practice is to use process mapping as the core tool in process improvement. Figure 1 depicts this typical approach to process improvement.
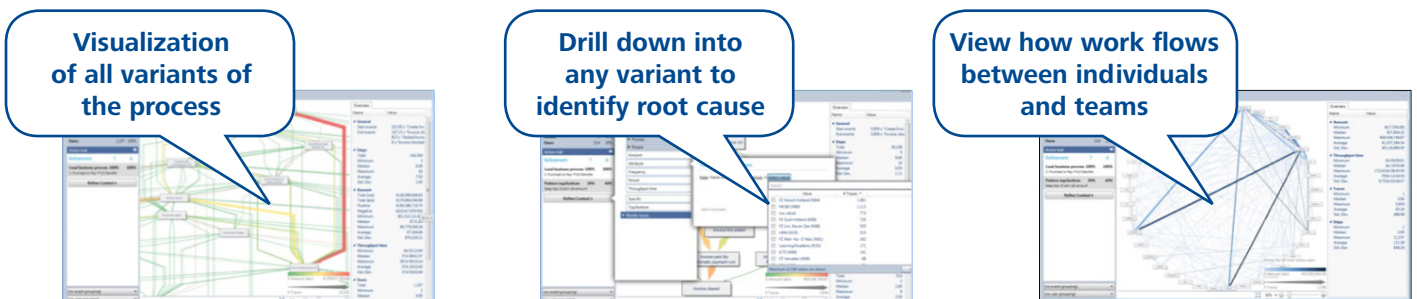
Process mapping is an important tool, but it has limitations. Process maps show how people think a process typically works or how it should work. How the process actually works often is quite different.

Figure 1. Typical process mapping approach

Map the as-is process

Identify "pain points"

Compare against leading practices
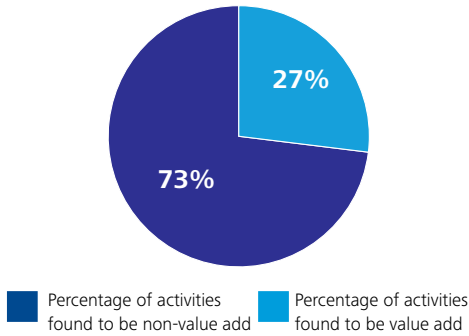
Draft the to-be process

Various advanced analytical tools can provide much richer insights and "intelligence" related to actual process performance. For example, Process X-Ray is a process analysis platform that reconstructs the actual process execution based on data from a company's underlying technology (Figure 2). It enables users to ask up to 10,000 questions to find the variants and root causes of problems in the process. As companies increase focus and investment on workflow automation and data analytics (big data), supplemental analytical process intelligence tools will become increasingly more important in driving toward solutions.[5]

Figure 2. Process X-Ray sample screens

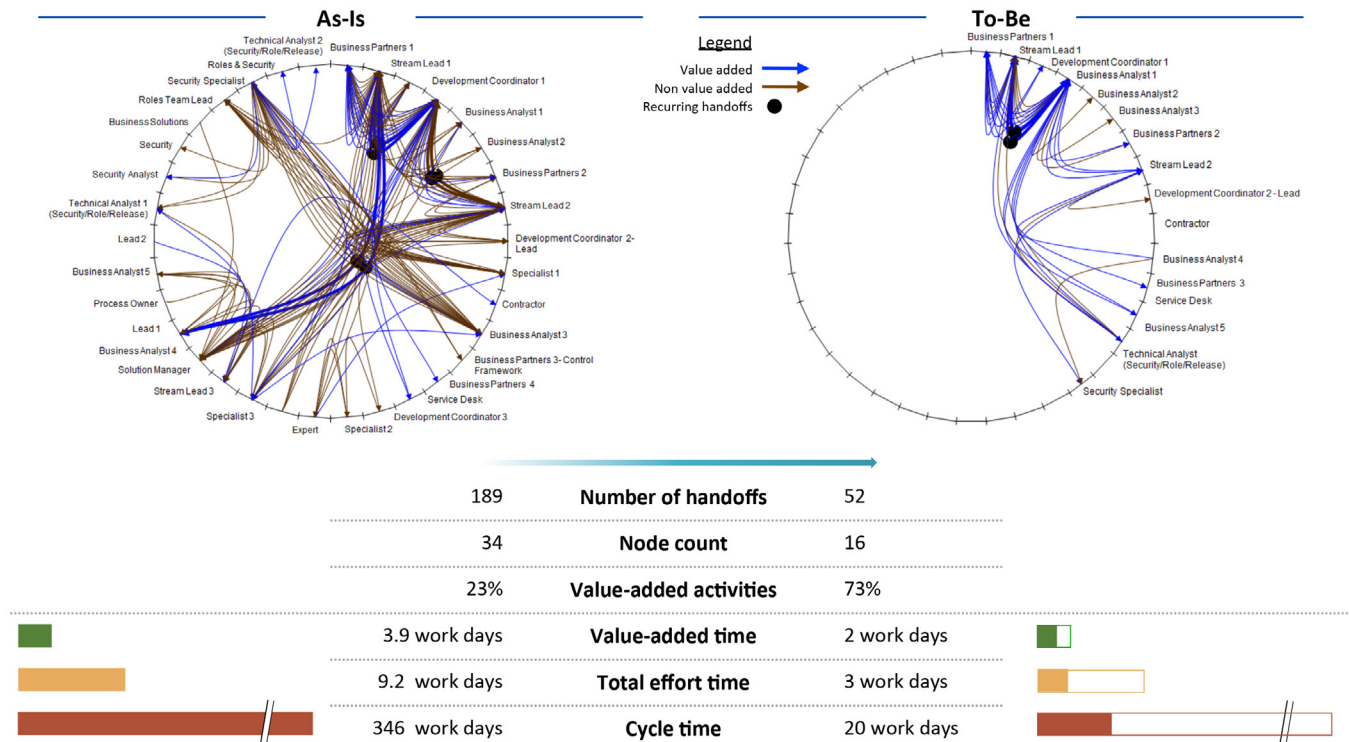Visualization of all variants of the process

Drill down into any variant to identify root cause

View how work flows between individuals and teams

[5] Ibid.

Figure 3. Average amount of waste in a process

27%

73%

■ Percentage of activities found to be non-value add ■ Percentage of activities found to be value add

Similarly, Detailed Value Stream Analysis recreates actual process performance at a handoff level of detail, enabling process improvement teams to identify which steps in the process are not adding value. A study of dozens of Detailed Value Stream Analyses across numerous organizations and industries revealed that 73 percent of activities in an average process do not add value (Figure 3).[6] Talk about Cliff Young-like potential.

The Detailed Value Stream Analysis tool creates a visual of the people and handoffs required in the process, as well as the time and effort required (Figure 4). The "intelligent" insights gleaned from this analysis help generate breakthrough improvements that are hard to realize when process maps alone are used.

Figure 4. Sample before and after Detailed Value Stream Analyses

As-Is		To-Be
189	**Number of handoffs**	52
34	**Node count**	16
23%	**Value-added activities**	73%
3.9 work days	**Value-added time**	2 work days
9.2 work days	**Total effort time**	3 work days
346 work days	**Cycle time**	20 work days

Tenet #3: Follow the facts

There is typically no lack of opinions when it comes to business improvement efforts. But when teams act on opinions, they often jump to the wrong conclusion (see Case Study: "Data-driven analysis clears the air"). A more "intelligent" approach is to convert opinions into hypotheses and test them with data before acting on them.

"Data is what distinguishes the dilettante from the artist."[7] According to a study conducted by the University of Pennsylvania and MIT, "data-driven decision making" achieved productivity that was 5 percent to 6 percent higher than could be explained by other factors.[8]

Making process improvement decisions based on data-substantiated facts rather than opinions and perceptions is like the shuffling gait of an ultramarathoner—in the short run, it may take a little longer, but over the course of time it helps foster alignment among people with different opinions and can lead to superior results.

Tenet #4: Buy runs, not players

In the movie Moneyball,[9] a statistician suggests the following: "People who run ball clubs, they think in terms of buying players. Your goal shouldn't be to buy players; your goal should be to buy wins. And in order to buy wins, you need to buy runs. Baseball thinking is medieval. They are asking all the wrong questions."

The same is true in process improvement. Many companies ask questions and use tools that fail to address root causes of problems. They employ temporary fixes that end up being costly and unsustainable. Such process improvement efforts effectively put a bandage on visible symptoms of problems, thus laying the foundation for disappointment – addressing symptoms alone virtually guarantees problems will reappear. When problems are identified and addressed at their core, the benefits tend to be greater and longer lasting.

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[7] George V. Higgins, The Guardian, June 17, 1988.
[8] "When There's No Such Thing as Too Much Information," Steve Lohr, The New York Times, April 23, 2011,
 http://www.nytimes.com/2011/04/24/business/24unboxed.html?_r=0.
[9] From Moneyball, the movie.

Tenet #5: Carry it across the goal line

In Super Bowl XXVII, the Dallas Cowboys' #78, Leon Lett, recovered a fumble on the Dallas 35-yard line and ran it toward the end zone. At the 10-yard line, approaching the end zone, Lett slowed down and held the football out in celebration, unaware that an opponent was chasing him down from behind. The opponent knocked the ball out of Lett's outstretched hand just before he crossed the goal line, sending the ball through the end zone and costing the Cowboys a touchdown.

In the absence of proactive leadership alignment and change management, process improvement teams can fumble before they cross the goal line, too. Two-thirds of executives indicated in a recent survey that competing priorities for time and resources often take precedence over process improvement efforts, resulting in an unstructured or undefined process excellence program.[10] Process improvement efforts can have the flashiest data-driven analyses and the most insightful recommendations that get at the root causes of the problem, yet those recommendations are worthless if others in the company don't accept and act on them.

Teams that take a thoughtful approach to engaging key stakeholders in the process improvement exercise tend to improve the quality of the analysis and recommendations while also improving the acceptance and adoption rate when the ball is carried across the goal line. Effective stakeholder management requires identification of individuals and groups the project affects, as well as frequent communication, risk planning, and active collaboration with stakeholders throughout the project life cycle. If executed effectively, stakeholder management can be the difference between a fumble at the 10-yard line and a winning touchdown — i.e., successful Lean Six Sigma implementation.

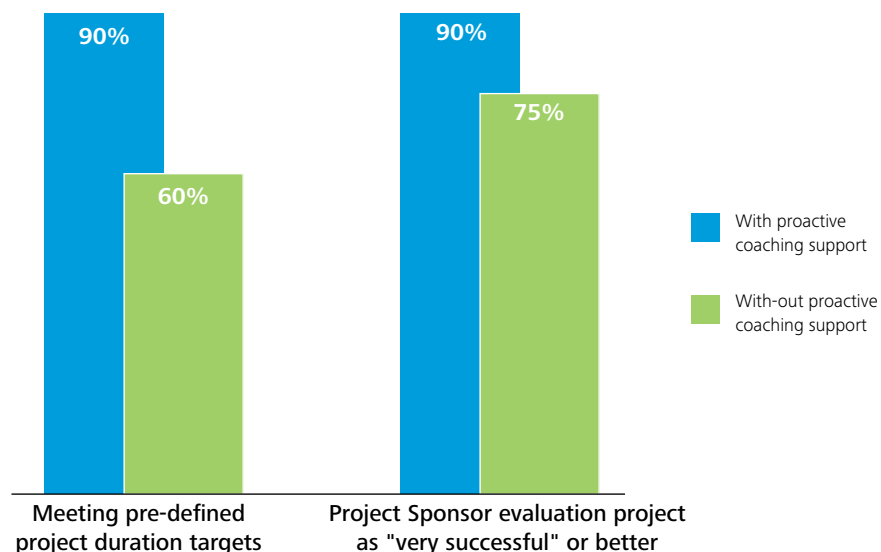[10] Op cit, 3rd Biennial PEX Network Report.

Tenet #6: Two heads are better than one

While training is essential for obtaining skills and knowledge, coaching and mentorship help people apply learning in the real world. Research of coaching effectiveness shows that a structured, proactive coaching approach where a schedule is followed leads to more successful project completion in comparison to an ad-hoc coaching approach.[11]

Such a mentorship model is necessary for effective implementation of Lean Six Sigma; it can keep teams motivated, foster continuous learning, and, most importantly, maintain improvement gains. One such model, the "belt" method, has been successful in helping teams draw from the wisdom of those who have walked the path many times before (Figure 5). Initially, mentorship can come from extended involvement of a Lean Six Sigma specialist, often an external resource, usually for one to two years. That specialist can then train company managers to take over the mentor role.[12]

Having specialists assist in Lean Six Sigma implementation is as crucial as any of the other five tenets. In the absence of necessary guidance and coaching, employees may misapply tools and concepts, waste effort, and reach inaccurate conclusions, actions that often lead to failed implementations. If a Cliff Young protégé was thrown into the race without proper guidance on the "tricks" to ultramarathon running, the Cliff Young success story wouldn't be repeated.

Figure 5. Effects of proactive coaching support

With proactive coaching support

With-out proactive coaching support

90% | 60% — Meeting pre-defined project duration targets
90% | 75% — Project Sponsor evaluation project as "very successful" or better

[11] http://www.isixsigma.com/implementation/teams/how-effectively-coach-green-belts-and-black-belts/
[12] http://online.wsj.com/news/articles/SB10001424052748703298004574457471313938130

Intelligent process improvement: Back to the future

If ever there was an ultramarathon in business, process improvement is it. It requires discipline, patience, consistency, and lots of hard work. When process improvement methodologies first came into vogue in the 1980s and '90s, they challenged 50 or more years of conventional manufacturing wisdom, enabling companies to improve manufacturing quality, reduce production waste, eliminate bottlenecks, streamline processes, and cut costs. Twenty or more years down the path, many variations of standard process improvement techniques and tools have been introduced. Along with them have come many opinions about which techniques and tools are most effective. However, one incontrovertible fact remains: Lean Six Sigma continues to be one of the most prevalent and consistently productive approaches to process improvement. By following the six tenets described in this paper, companies can continue to leverage Lean Six Sigma for solid results in the modern ultramarathon that process improvement represents.

Case Study
Data-driven analysis clears the air

A company experienced problems with the amount of time required to secure new equipment needed to support operations. The company purchased more than 2,000 pieces of equipment each year. By its own estimate, the company typically took more than 16 weeks to define requirements, approve the purchase order, and deliver, install, and test each piece of equipment.

A 16-week cycle time was simply unacceptable. Tempers flared, and many opinions were offered about what, or who, was to blame. Two of the strongest opinions gained traction: the first was to reduce the number of approvals required for each purchase order; the second was to have vendors speed up their processing by keeping the most common types of equipment on hand.

The organization spent several months implementing these ideas, but much to its dismay, the problem only got worse. Leadership enlisted outside help to take a demonstrated and time-tested approach to addressing the problem – a data-driven approach that translated the internal team's opinions into hypotheses and tested those with data. In one hypothesis, a correlation analysis confirmed that the number of approvals needed for each purchase order was not the factor contributing to the long cycle times.

The external team also used Detailed Value Stream Analysis to measure the current process in detail and to uncover root causes of the problem. The Value Stream Analysis confirmed that having vendors speed up the delivery wouldn't shorten the cycle time, either. Instead, they discovered a root cause problem at the end of the process: a bottleneck in the final delivery and installation of the equipment. The improvement ideas implemented previously only pushed that root cause problem further downstream in the process. By addressing the bottleneck at the end of the process, the company could address the root cause problem and, it was estimated, achieve Cliff Young-like improvements of more than 40 percent reduction in equipment procurement cycle times.[13]

[13] From Deloitte engagement experience.

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