EXECUTIVE SUMMARY
A study focusing on leadership development identified that the complexity of change management impacted the type of leadership that a team would select for its team environment. As the complexity for change management increased, Six Sigma quality improvement teams relied more on shared leadership approaches. But as the complexity for change management decreased, the teams adopted a more centralized leadership approach. This implies that Six Sigma teams and their external mentors should be trained in change management techniques and leadership approaches to maximize effectiveness.
The topic of how leadership affects quality improvement teams has received much attention in the past few years, mainly due to society’s continuing evolution away from “top-down” approaches that aren’t as effective as they were in the past. More employees are completing projects in a team format which allows the organization to adjust to its industry’s requirements and demands. But the proper leadership approach needs to be selected to enable the team to make rational, timely and effective decisions.

Academics and practitioners have researched the “shared leadership” model for the past 20 years. In their *Academy of Management Journal* article “Shared Leadership in Teams: An Investigation of Antecedent Conditions and Performance,” Jay Carson and his co-authors detailed how this leadership model helps team members and organizations complete projects on time and make effective and logical decisions. As traditional project management techniques prove more inadequate, organizations are leaning more toward Six Sigma methodologies that help them adapt to change and cope flexibly with dynamic project requirements. Distributing responsibility to project teams helps the organization respond to changing demands.

This study sought to investigate leadership in quality teams working in the healthcare environment. In particular, researchers wanted to examine how change management affected the degree of shared leadership these teams chose through the five different phases of the Six Sigma process (define, measure, analyze, improve and control).

The research study collected quantitative and qualitative data from eight Six Sigma teams from the healthcare sector during the first four phases (define, measure, analyze and improve) of the DMAIC process. Three green belts and one black belt made up each core team. One external coach, a master black belt, provided support and mentoring throughout the Six Sigma project. Data was collected via surveys during each phase, surveys that included quantitative and qualitative questions.

The quantitative data was analyzed by using advanced non-parametric statistics (Wilcoxon Matched-Pairs Signed-Rank Test) to determine statistical significance between the change management factor and leadership approach during each DMAIC phase. The qualitative data was analyzed by performing coding and textual analysis to identify themes and patterns for each variable the study investigated.

The quantitative and qualitative analyses developed accurate conclusions about how change management affected a team’s leadership approach throughout each DMAIC phase. The execution of the study enabled the identification of the effects that change management had on leadership approaches throughout the DMAIC process.

This article highlights the findings of that research study, which, although it focused on practitioners from the healthcare sector, has implications for practitioners of industrial engineering and Six Sigma overall.

**Key definitions**
The Six Sigma methodology uses the DMAIC structure and a set of improvement tools to identify causes of variation and to develop improvement strategies that reduce opportunities for defects and variation in a process or system of processes.

There are several modern theories and models, or approaches, to leadership. Shared leadership is created when individual team members engage in activities that influence the team and other team members, but shared leadership is also created through interactions, like when members share and negotiate leadership responsibilities. In addition, shared leadership can be thought of in terms of the strength of influence and the source of influence (single versus multiple team members). Many researchers believe that shared leadership can be conceptualized along a continuum based on the number of leadership sources that have a high degree of influence in a team.

Change management involves the aspects of change related to the human condition and the resistance stakeholders might display. Any improvement project’s effectiveness is based on two aspects, the quality of the solutions and the acceptance of the solutions by the stakeholders. Acceptance requires effective change management and is a responsibility of the internal team members and, in some cases, the external coach as well.

**How change management affects shared leadership**
Change management is a large and complex segment of the DMAIC approach to quality improvement. The complexity of change management that Six Sigma teams displayed depended on each phase’s deliverables and how much involvement each phase required from stakeholders. Some phases required stakeholders to participate more, which in turn increased the level and complexity of change management shown by the Six Sigma teams. As the complexity for change management adjusted from each phase, teams altered the type of leadership they employed; the two factors appeared to be linked. Higher levels of change management complexity led teams to increase their degree of shared leadership. This spread accountability and responsibility for deliverables among the internal team members.

Specifically, the measure and improve phases had high degrees of
complexity for change management; concurrently, the teams displayed high degrees of shared leadership during these DMAIC phases. But the define and analyze phases exhibited moderate degrees of change management complexity, and the teams displayed moderate degrees of shared leadership, implying that teams relied on a more centralized leadership approach during these phases, perhaps being led by one or two team members.

The complexity for change management also affected how heavily the teams relied on their external coaches, especially in team environments that had consistently low degrees of shared leadership. Teams that exhibited less shared leadership relied more on support from their coaches to manage the “change” involved in the DMAIC process.

In DMAIC phases that required a high complexity of change management to complete deliverables, the Six Sigma teams needed to rely on a shared leadership environment to meet customer requirements. This was a critical takeaway that held true for the measure and improve phases.

However, in phases where a high complexity of change management was not a critical aspect, the Six Sigma teams could rely on a leadership environment that centralized around one or two key team members. This held true for the define and analyze phases.

So in areas that required a high complexity of change management, the shared leadership approach was more appropriate. While teams could use a shared leadership approach in phases that did not require such complex change management, it did not add much value to the team’s ability to complete its deliverables.

Let’s examine more deeply why change management had a significant effect on a team’s shared leadership environment at each phase of the DMAIC structure.

**Measure and improve phases**
Deliverables associated with the measure and improve phases are complex, and tedious tasks can be difficult to complete quickly. Stakeholders who weren’t Six Sigma team members had to be involved in these phases because the deliverables touched many process areas that were beyond the team’s control. So successful teams had to rely on support and buy-in from their stakeholders.

The increases in time commitment and the numbers of people involved meant that change management, especially in terms of team dynamics, became more complex. More participants meant more potential resistance from extended team members and customers. And buy-in was required since the team’s deliverables required support from these additional people. Thus, since people are naturally afraid of change, the internal core team had to ameliorate the concerns of a large group of people.

After all, a quality solution is no good if it is not accepted. And stakeholders who don’t buy in are unlikely to sustain any process improvement. This is the essence of effective change management – overcoming the resistance people tend to display when change is happening. In both the measure and improve phases, the change management aspect was critical. The core team had to manage the logistics inherent with the involvement of multiple extended team members and customers, their personalities and resistances, and the change management piece of the project. Failure to do so would endanger the team’s ability to meet each phase’s deadlines with deliverables that satisfied their customers.

This change management task was too overwhelming for only one or two team members to handle. However, shared leadership structures were up to the task. So during
the measure and improve phases, the internal core team had to evolve how it handled the management of change. Overcoming the diverse issues of resistance from extended team members and customers required inner core team members to establish a shared leadership environment.

Higher degrees of shared leadership allowed the Six Sigma teams to distribute leadership responsibilities and actions evenly among its team members. This allowed more inner core team members to engage with outside stakeholders, addressing their concerns and overcoming resistance to change. This helped inner core team members deal with the concerns of change management and the deliverables associated with the measure and improve phases. The team was able to manage and lead all of the moving components effectively.

Since the measure and improve phases of the DMAIC structure exhibited a high level of change management complexity and the Six Sigma teams responded with a high degree of shared leadership, it appears that the shared leadership approach is more appropriate in such cases. In these phases, the study found, a centralized management approach was unlikely to accomplish the team’s objectives.

**Define and analyze phases**

The measure and improve phases had deliverables and tasks that required a significant amount of input and involvement from stakeholders in the projects, which added extra layers of complexity for the core team to deal with. While change management was still important in the define and analyze phases, the different deliverables required a lower level of change management complexity.

Although these phases had deliverables that were both tedious and complex, unlike the measure and improve phases, fulfilling these customer demands did not require the intensive involvement of numerous stakeholders. Instead, these tasks required more time commitment and resources from the internal core team, a much heavier contribution, in fact, than was required in other Six Sigma phases.

This meant that the Six Sigma teams did not require a high complexity of change management. Team members believed they could fulfill their tasks by depending on the leadership skills of one or two specific team members who were proficient in the deliverables and tools associated with these two phases. Therefore, they centralized the leadership role around these members. This was sufficient to handle the logistics associated with the necessary deliverables.

So for these moderate degrees of change management complexity, the Six Sigma teams established an environment with moderate degrees of shared leadership, relying on centralized authority more in the define and analyze phases than they did in the measure and improve phases.

These findings indicate that if complex change management was not a critical aspect of a phase, the Six Sigma teams could deliver satisfactory results and meet their customers’ needs with a centralized management approach. Throughout the study, these findings held true for the define and analyze phases. While teams could apply a shared leadership approach during these phases, it likely would add little value to the team’s ability to fulfill its goals.

**Practical applications**

The findings from the study lead to the identification of two key implications for practitioners of industrial engineering and Six Sigma methodology.

The first implication revolved around the need for internal members and external coaches to have the ability to identify and understand the relationship between change management and leadership. The second implication was that a Six Sigma training program needed to include training and educational modules on both of these critical topics.

In order to complete the deliverables and tasks as well as manage the varying degrees of change management associated with each phase of the DMAIC structure, a Six Sigma team and its external coaches need to be able to identify the relationship between the leadership and change management, along with understanding how the complexity of change management will affect the leadership style that is appropriate to each phase of the project.

From the Six Sigma team’s perspective, this will allow members to select the right leadership structure. This will empower the team to respond effectively to the dynamic demands of change management complexity that increase and diminish throughout the project. In turn, the team will be able to manage the DMAIC structure to deliver the results that the stakeholders need and demand from each phase.

Each Six Sigma project has different needs. And each phase of the DMAIC structure has deliverables that differ in complexity. More complex deliverables required more complex change management. Since the study found that these differed depending upon the phase, picking one leadership approach for the entire project did not yield optimal results. Change management and leadership approaches needed to be altered to fit the phase at hand. The type of leadership approach had a significant impact on the team’s ability to complete each phase successfully.

This highlights the fact that your Six Sigma teams must be cognizant of the relationship between change management and leadership.
THE BIG FOUR OF CHANGE

According to author and organizational anthropologist Judith E. Glaser, four factors distinguish successful change management initiatives from those that fall.

Glaser, CEO of Benchmark Communications Inc. and chairman of The Creating WE Institute, wrote for The Huffington Post that successful change involves finding solutions to four main problems that often crop up during improvement initiatives.

First, stop trying to manage resistance by labeling those who resist recalcitrant. Understand that people need to challenge new ideas before they can accept them. Involve them with dialogue; don’t lecture them with PowerPoint presentations.

Second, create candid forums where people can learn about what is going on and what their new place will be. Don’t underestimate the number of conversations needed to create buy-in. Transparency and openness can translate the fear of loss into the anticipation of gain.

Third, understand that change is head, heart and soul, not logic. A “just the facts” approach often won’t tap into the emotions necessary to drive change. Instead, storytelling and narrative will engage the emotions and help your audience bond instead of fight.

Fourth, sometimes patience is necessary. Instead of the tell-sell-yell approach, create conversational practices that enable people to work together to co-create the future. Such “navigational communications” can help lead others in and out of scenarios from multiple perspectives, allowing your people to find where they can help create and fit in with the revamped organization.
management and leadership during each phase. The ability to alter the leadership approach as teams move from phase to phase enhances the overall results of Six Sigma projects.

From the external coaching perspective, the coaches need to grasp these differences as well. Different leadership styles and structures affect the type (coaching style) and degree of coaching and support that the external coaches need to provide at each phase of a project. At times when the Six Sigma team employed a shared leadership approach in their projects, core team members acted in a more autonomous fashion, and they did not rely as much on the coaching and guidance of their external coaches. In these cases, the leadership role was distributed among the internal team members.

The external coaches only stepped in at times when team members could not address a conflict or make a decision in their shared leadership environment. In fact, when teams were operating under a shared leadership approach, core members only reached out and included their mentors at times when the team had “no other option.” In the study, this was a rare occurrence.

But external coaches were more involved during DMAIC phases that exhibited a more centralized leadership approach, where the degrees of shared leadership were low or moderate. At these times, the teams relied more on the support from their coaches to help them manage the “change” pieces of the Six Sigma process. This extra involvement from the coaches helped ensure that the teams were progressing in the proper direction. Thus, the conclusion is that in these cases more involvement by the external coaches was the norm.

This signifies that a coach’s style of coaching and degree of involvement must be fluid throughout the execution of a project. While the ebbs and flows of coaching involvement are dependent on several factors, the study clearly showed that the degree of involvement is directly related to the type of leadership being employed by the team during each project phase.

As mentors, external coaches must be able to gauge the performance of their team continuously in order to assess whether the team’s leadership approach is being effective in achieving the objectives of that particular DMAIC phase. This, in turn, will enable the external coaches to be more proactive if they find that the team is having any problems or issues that could forestall success.

It is not enough for a coach to conclude that if a team is utilizing a shared leadership approach, then the coach does not need to be involved. In certain instances and phases, a team employing a shared leadership approach might not be making sufficient progress toward that phase’s objectives.

By continuously monitoring the progress of a team’s performance, external coaches will be able to identify points where the team’s leadership approach is not working properly, adjust their coaching style and become more involved with the team before problems fester, grow and become unmanageable or unsolvable. This is how good mentors make sure their teams are moving in the proper direction and have the highest potential for reaching their goal.

The right leadership brings the right results

During any Six Sigma phase, teams that cannot properly handle the demands of change management or that employ ineffective leadership approaches endanger their ability to complete that phase on time. The teams that have the skill sets to assess the demands of each project phase can select the change management tools and leadership approach that will enable the team to achieve its maximum potential effectiveness during each phase. This implies that a Six Sigma training program must include training and education that focus on change management tools appropriate for Six Sigma projects so that they can properly manage the dynamic demands of this factor.

In addition, a Six Sigma training program must include education that focuses on the different approaches to leadership as well as the applications of each approach; this type of training will enable a team to assess the needs of a project or phase and select the appropriate leadership structure that would enable the team to manage the “people piece” of a quality improvement project.

After all, the effectiveness of any quality improvement project is based on two aspects: First, the quality of the solutions and deliverables; and second, the acceptance of the solutions by the stakeholders and customers. The acceptance piece is the segment that requires an effective change management methodology. A team might be able to develop quality solutions, but if it lacks change management skills, it will not be able to account for the important human piece of the improvement project puzzle. Training your Six Sigma teams for these skills will enable them to have a higher degree of effectiveness for their improvement projects.