

Enlisting Lean Six Sigma in the Army Acquisition Process

Leon Smith ■ Randy Wilson ■ Tiffani Burke

As resource managers, our business is not turning a wrench to move the chassis frame to the next station. Rather, we work in a white-collar environment. Our job is to enable our senior leaders to make informed decisions early in the decision-making process and to ensure high-priority requirements are funded to meet the capabilities needed to keep our servicemembers alive.

Understanding the Reason to Change

An understanding of the root causes of change is necessary before we begin to address solutions to a problem. Specific changes in an organization's structure or process are often derived from broader social, economic, and technological changes. General trends in society, politics, and demography affect everyone. As we review our everyday actions in the context of strategic financial decision making, we understand the importance of having timely, accurate, and executable financial management improvement in our environment.

Today's operations involve:

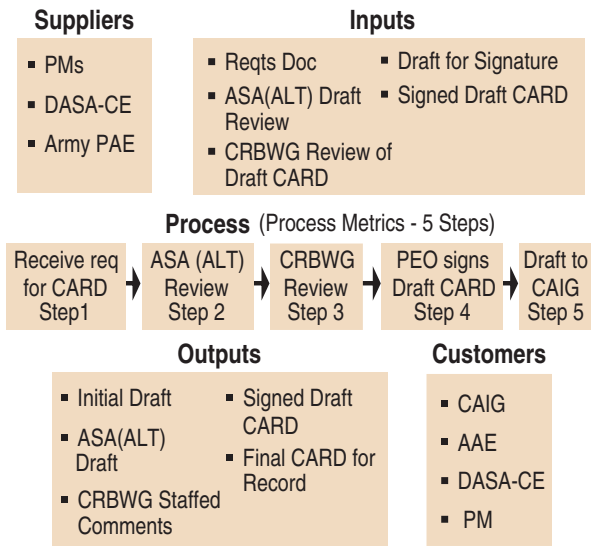
- Constrained budgets
- Increasing accountability and transparency
- Enterprise systems
- Emphasis on controls
- Need for timely resource decision making
- Emphasis on results-oriented government.

At the initiative of assistant secretary of the Army for financial management and comptroller (ASA[FM&C]) and the assistant secretary of the Army for acquisition, logistics, and technology (ASA[ALT]), the Army began to review the Army's acquisition cost process to identify opportunities to standardize the process and reduce cycle time. The opportunity to review the Army cost process was aligned with one of the pillars of the fiscal year 2007 ASA(FM&C) overarching strategies: implement Army business transformation. One of the strategic objectives of this overarching strategy is to "support Army-wide LSS [Lean Six Sigma] and business transformation and focus on results of financial management LSS projects Army-wide."

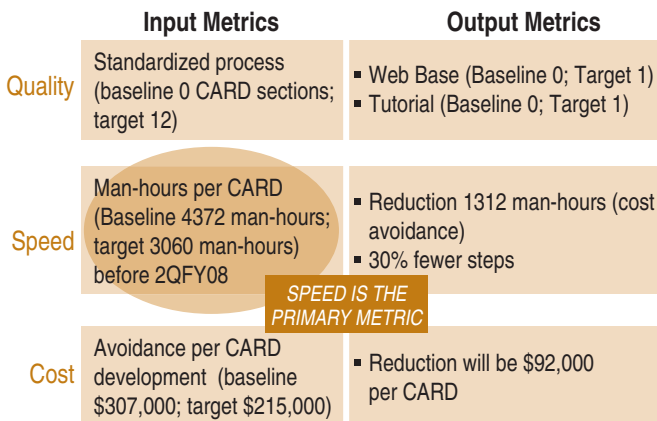


Smith is a colonel in the U.S. Army and is currently the acting deputy assistant secretary of the Army for financial information management in the Office of Financial Management and Comptroller. He was the green belt candidate and CARD team leader. **Wilson** is currently the acting director for business transformation for the Office of the Deputy Assistant Secretary of the Army for Cost and Economics. He served as the cost subject matter expert for the CARD team. **Burke** is the business applications manager in the Information Technology Operations Office in the Office of the Deputy Assistant Secretary of the Army. She was the IT lead on the CARD team.

SIPOC Map (Part 1)



SIPOC Map (Part 2)



Creating a LSS Team

To support this objective, a LSS team stood up in September 2006 and conducted a thorough review of the entire Army acquisition cost process. The team consisted of subject matter experts from ASA(FM&C) and ASA(ALT) and program manager/program executive officer representatives. Representatives from the Office of the Secretary of Defense Cost Analysis Improvement Group (CAIG) were also included to provide a customer perspective.

The team found that the CARD—the Cost Analysis Requirements Document—should be examined as a separate LSS project. A CARD is a document required of every Acquisition Category I program as it passes through the milestone decision review process. Created by the program manager, the CARD is a living document that describes the prominent features (12 sections) of both the acquisition program and the system itself, and it provides the basis for the life cycle cost estimate.

The authors of this article formed the CARD team, and we used LSS to analyze the best ways to improve the processes.

The LSS Process

Prior to our analysis, we had to ensure we all understood the purpose of the CARD. We also had to ensure everyone knew what we were going to examine. We then started the Lean Six Sigma process.

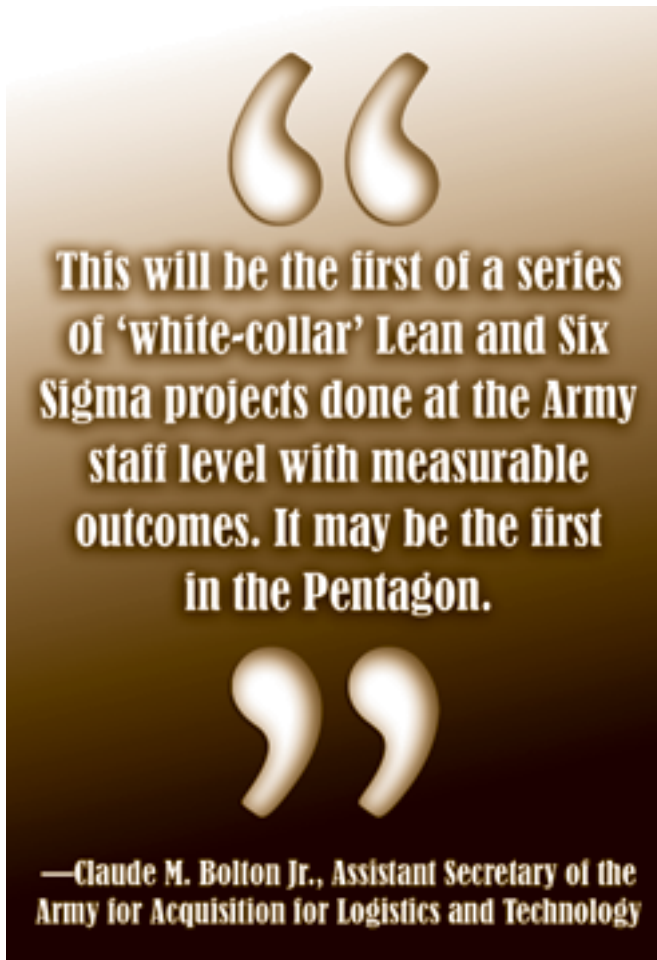
The LSS process has its own methodology that can be applied to any manufacturing, transactional, or service process to reduce waste, eliminate non-value-added functions, and reduce cycle time. The LSS process has five phases—Define, Measure, Analyze, Improve, and Control. The CARD team followed the DMAIC methodology, concluding each phase with a review that was given to the project sponsors, deployment directors, and at times, the senior leadership of the Army.

Define. In this phase, we defined the scope of the project (what was in-scope and out-of-scope) and the project requirements. We used “voice of the customer” inputs to determine root causes, priorities critical to quality, and critical design elements.

CAIG members were interviewed early in the process so we would understand what the customer desired. CAIG members wanted the primary metric of the CARD to be speed, though speed with quality was essential. As the project progressed, we revisited with CAIG members several times to ensure that we were redesigning the process to their specifications, and to ensure that the metrics remained consistent with their desired output.

Our team also examined the causes and effects of the root problems and found several shortfalls. The current CARD process had non-standard documentation processes (lack of standard operating procedures) as well as variable cycle times with each program management office (man-hour variance). Using our analytical LSS tools, we constructed a quality function deployment chart for prioritized root causes and found that the absence of suspenses, automation, centralization, and standardization caused program managers to use multiple document formats. In addition, there were multiple rewrites, an excessive number of documents, and little control over the changes made to those documents.

We developed a process map addressing suppliers, inputs, process, outputs, and customers (SIPOC). The map identified the suppliers to the process, the inputs provided by the suppliers, a map of the process, the outputs produced by the process, and the customers who utilized the outputs. Using the SIPOC map, we were able to prioritize the inputs and controls to develop a primary metric. In addition, we developed a RACI (responsible, accountable,



consulted, informed) matrix to provide the team structure, and we formed a stakeholder analysis that evolved into our communications plan.

Measure. We developed a data collection survey and collected data from the program managers on their efforts to produce a CARD. We used the primary metric derived in the define phase to determine the sigma quality level (an indicator of how often defects are likely to occur), establish control limits, and project cost reductions.

Analyze. We analyzed the data collected using a cause-and-effect/fishbone diagram to discover root causes, and we used the LSS design of experiment tool to understand and reduce variation. We also performed an analysis on the redesign elements.

Improve. After we analyzed our redesign elements, we were ready to demonstrate the advantages that would be realized if we executed them in the new CARD process. In the improve phase, the four new elements were technically feasible, economically sound, acceptable, and executable with the implementation of the new process.

Control. As the team finalized the CARD project, we constructed another quality function deployment to under-

stand what elements we needed to control in the new process. The new redesign elements had to be prioritized for control discipline to ensure that the elements with the biggest impact on the new design were going to be heavily sustained. In our control phase, we found the highest degree of impact to the new process was having in place a control mechanism that would sustain the feeder documents, providing critical information to the CARD sections.

LSS Deliverables

As part of the CARD-to-be process, the team began with the DoD 5000.4M document, “Cost Analysis Guidance and Procedures,” and transformed the CARD sections and the necessary documents into a standardized format.

The specific 12 CARD sections were put into Microsoft® Word and aligned with the master CARD document format. Once the CARD shell was created, it and other necessary documents were uploaded to the Army Knowledge Online Portal, which is the largest and most mature of all Department of Defense portals. This adaptive and agile portal features an architecture that facilitates knowledge management, information sharing, and collaboration across the entire Department of the Army.

The portal consists of personalized, user-defined tools that allow for secure access. There are three levels of access to AKO’s new CARD knowledge center: read-only, author, and administrator. A common access card and an AKO account are the two primary tools needed to access the knowledge center

A CARD tutorial was created to assist users and help them navigate through the CARD knowledge center and display files and documents that are contained in this knowledge center. The tutorial also shows how a program manager would manage and monitor documents hosted within the CARD files.

Change Isn’t Easy

The CARD team faced numerous challenges throughout the entire process, and here are some of the reasons why change wasn’t easy:

White-collar environment. The idea of a white-collar team conducting a LSS project in a non-manufacturing environment was new to white-collar employees, causing some skepticism.

Lack of SOPs. Since we were the first team at Army headquarters to conduct a LSS project, we had to develop standard operating procedures, templates, instructions, and other necessary documentation to support our efforts.

New LSS support structure. The LSS support structure was getting established at Army headquarters at the same

time our team started work on the project. Working together, we leveraged our collective strengths to make the LSS process successful.

Longevity of CARD team members. We initially estimated the project would last three months. As the project progressed, we found the duration was going to be about five months. The point here is that the estimated time may be longer, and team members' supervisors need to be flexible.

Turf battles. Sometimes it's true: What is right for me is not right for you. This is the reality of the turf battles. The team must be composed of members who will remove their turf hats and work together.

Consensus building. The LSS process is multi-generational. The team needs to understand what is in-scope and out-of-scope for each generation, which will help in setting realistic expectations. Because of limited resources and time, the team will have to possibly accept the scope as not all-inclusive. The additional efforts to improve can be done at a later sequel to this project in the form of multi-generational projects. In our project, we projected the multi-generational perspective out three generations.

Competing Conflicts. Team members will have full-time jobs, but the expectations for a LSS project imply some commitment—at least 25 percent of the project's leader's time. The leader will maintain the momentum of the overall effort. The remaining team members will have varied commitments.

Team reluctance to follow the LSS approach. The five-phase process of LSS is intense and requires constant commitment. The team may try to avoid the time-consuming analytical tools to cut to the chase. However, the tools have been tested and will yield results—they will identify the root causes and substantiate what is not the obvious. By using the analytical tools in each phase, we found several root causes that we did not know. The bottom line is that shortcuts will not afford a team the opportunity to provide the senior leadership with the best redesign solution to implement.

An Example for Future Processes

The redesign of the CARD process represents a significant step for Army LSS. The recommendations proposed by the project team were implemented in March 2007. Key recommendations included a standardized, electronic CARD format with a standardized (one variable) submission process.

The forecast results of this project should be realized by the second quarter of fiscal year 2008 and include the following estimates:



- A reduction in man-hours from 4,300 to 3,000 for each CARD
- Cost avoidance of \$92,000 for each new CARD completed.

The success of the Army CARD project stands as a hallmark for Army LSS activities because of its ability to address white collar processes with clear and demonstrable goals for program success. ASA(ALT) is continuing to identify improvement opportunities to the milestone decision review process and will be convening a series of teams to streamline other high-level, cross-functional processes similar to the CARD.

The acquisition, logistics, and technology community has previously shown how LSS can be applied to manufacturing processes. However, the CARD project is a great example of how LSS can also be effective when applied to transactional processes. Additionally, we were able to go outside organizational boundaries to hit a high-level, high-impact process that will bring bigger savings and improvements than if we just worked within our functional silos.

The authors welcome questions and comments and can be contacted at leon.smith@us.army.mil, randy.david.wilson@hqda.army.mil, and tiffani.burke@hqda.army.mil.