Supplier Request (SR) Process Streamline and Optimization

Ramón L. Santiago Pedroza
Master of Engineering Management Program
Dr. Héctor J. Cruzado Vélez
Graduate School
Polytechnic University of Puerto Rico

Abstract *— The Supplier Request (SR) process is used by the supply base to electronically submit Process or Engineering change requests against the contractual relationship or approved technical baseline. The process is not optimized when it comes to the processing of Process Change Requests (PCR) type SR's. The team identified three main process wastes: repetition of tasks, program independent reviews and inconsistent information provided by the supplier. The new streamlined and optimized process was able to meet the objectives and exceed expectations. The first pass yield was improved from 30 percent to 100 percent and the average cycle time was improved from 114 days to 24 days. Year to date, the project has contributed to the organization two million dollars in costs avoided. The next project phase would be to deploy the new process for all programs across the mission areas and suppliers across the supply base.*

Key Terms *— Lean Manufacturing, Process Improvement, Project Management, Supplier Management.*

INTRODUCTION

This project takes place at a prime defense contractor for the United States of America. The company is a multinational corporation that has multiple sites located across the United States and overseas. At this time, the scope of the project will be limited to the site located in Tucson, AZ which is the largest site with over twelve thousand full time employees. The Supplier Request (SR) process is used by the supply base to electronically submit Process or Engineering change requests against the contractual relationship or approved technical baseline. The process is not optimized when it comes to the processing of Process Change Request (PCR) type SR's.

Project Overview, Scope and Need for Improvement

A process change at a supplier can affect multiple families of products for which the baselines are controlled by each individual customer program. These common PCRs would need to be reviewed and approved by all the different customers depending on the products being affected by the change. Since different customer programs control the product baseline, a single process change affecting seven different programs would require seven individual PCR type SR's which leads into seven different independent reviews and approval before the supplier can implement the changes on their end. This increases the approval cycle time and processing costs by a multiple that is equal to the number of programs being affected by the process change.

Feedback gathered from supplier engagement activities suggest that suppliers get frustrated by the process and state that SR's are not answered in a timely manner and that the suppliers are being discouraged from submitting process improvement SRs due to the long cycle time. On the other hand, internal stakeholder's feedback suggest that the information provided by the suppliers is not sufficient and lack the level of detail and engineering rigor required to properly review and approve the SR's in a timely manner which leads to longer approval cycle times.

Project Objectives

The objectives set by the team, directly address the concerns of internal and external stakeholders:

- Improve average PCR Type SR approval Cycle Time from 114 days to 30 days by end of Q3 2020.

- Improve PCR Type SR approval First Pass Yield from 20% to 75% by end of Q3 2020.

METHODOLOGY

For this project, the team will follow the methodology established by the company to conduct business process excellence and continuous improvement projects called Rsixsigma (R6s). The methodology is very similar to industry wide lean and six sigma methodologies, but it's been tailored to meet the needs and care bouts of the company. The principles of R6s revolve around providing value in the eyes of the customer and identifying the value stream in order to eliminate waste and variation wherever possible. It is also intended to make the value flow consistently with the pull of the customer by involving, aligning and empowering employees with the purpose of continuously improve knowledge in pursuit of perfection.

The program was founded based on 3 key methodologies:

- **Traditional Six Sigma:** Six Sigma was originally developed by Motorola and is focused on using statistically methods to identify causes of variation and eliminate defects.
- **Enterprise Lean:** Developed at Toyota, Lean is focused on eliminating waste to increase throughput and reduce costs.
- **Theory of Constraints:** Developed by Eli Godratt, this theory shows that only by focusing on the overall system, can you provide true improvement for the enterprise.

R6s provides many tools that the team will have at their disposal and that can be useful for the purpose of data capture, data analysis, decision analysis and resolution. Figure 1 presents a snapshot of the R6s user interface and shows a summary of the tools available to the team divided by areas of interest and sorted by the most used tools.

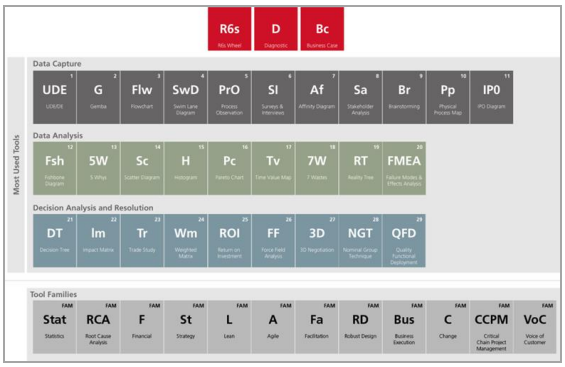

Figure 1
R6S Tools

LITERATURE REVIEW

As stated in the previous section, the R6s methodology used for this project was established by the company as a guideline for employees to conduct business excellence and continuous improvement projects. The methodology is very similar to those available industry wide like lean manufacturing and six sigma methodologies, but it has been tailored to the company needs and care bouts. The R6s methodology plays a key role for the organization when it comes to business process optimization since in order to achieve a competitive advantage, organizations must always look for ways to increase efficiency in order to successfully execute critical business processes [1]. In order to achieve the goals of this project, the team will need to develop creative ways to improve the process in order to achieve faster process outcomes with fewer problems along the way [2]. Streamlined business processes can help reduce errors and accelerate progress at the same time that improves accountability by clarifying job duties which leads to improved employee morale and engagement [2].

Figure 2, provides a visualization of the lean implementation cycle and the thought process that the team will go through in order to be able to reduce or eliminate non-value adding activities and waste which is the core principle of Lean [3]. In a continuous improvement environment, any improvement will result in change, therefore it is critical for the team to apply proper project management techniques to all the activities within

the project in order to construct the best path to success while minimizing risks [4]-[5].

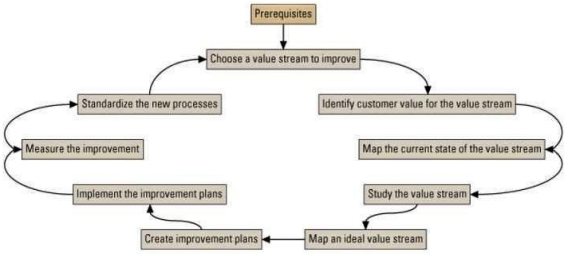

Figure 2
Lean Implementation Cycle

ANALYSIS

The team used the tools available in the R6s methodology to analyze the current state of the process, gather metrics data and develop improvement ideas to come up with a streamlined and optimized process that can be implemented in a phased approach across the organization.

Current State Process Mapping

Currently, the organization is operating a non-optimized SR process for when suppliers submit process changes that affect multiple programs. Due to the nature of the process, multiple SR's are submitted for each program to independently process through their respective engineering review boards. Figure 3 provides a high-level process flow of the current state.

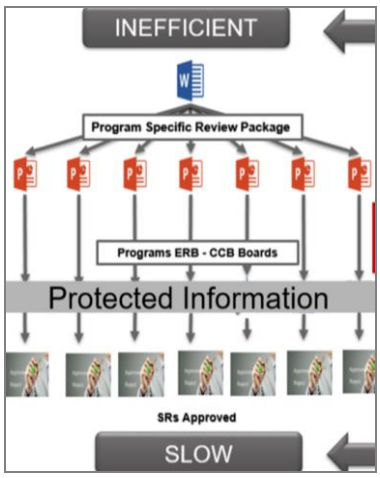

Figure 3
SR Process Current State

Data Analysis and Idea Generation

Figure 4 shows the data collected by the team in order to support the business case for the project. The data shows the spread of aged SR's which seems to be significant and may represent unresolved risks for the programs affected. The team used the Undesirable Effects (UDE) and Seven Waste (7W) tools from R6s methodology to identify waste in the process. The main wastes identified were repetition of tasks, independent reviews and inconsistent information being provided by the supplier.

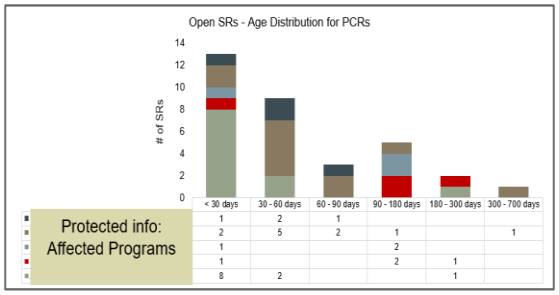

Figure 4
Open SR's Age distribution

Future State Mapping and Pilot

In order to generate the future state of the SR process, the team used the Brain Storming (Br), Stake Holder Analysis (Sa) and Weighted Matrix (Wm) tools from R6s as the basis for decision making and selection of the best solutions to address the main UDE's and process wastes identified during the current state process mapping and data analysis stages. Figure 5 shows the resulting future state process flow in comparison to the current state process flow.

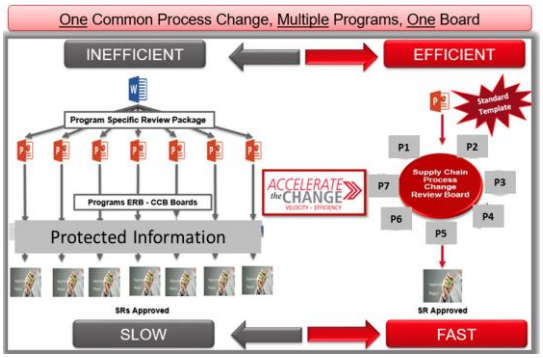

Figure 5
SR Process Current vs Future State

In order to put the future state process to the test, the team generated formal documentation or command media that provides instructions, guidelines and run rules on how the pilot would operate. These included updating the configuration control plans for the programs participating in the pilot which will avoid conflicting command media and potential audit findings.

RESULTS

The new process became online as soon as the command media and the program configuration plans were released. This enabled the team to go live with the project pilot and start processing SR's through the preliminary review, joint peer and subject matter expert reviews and preparing the SR's for the change review board.

Pilot Results

Year to date, twenty SR's have been processed using the new process. All of them have been approved for a first pass yield of 100 percent which is better than the established goal. The average cycle time of the new process is 24 days, which is better than the established goal. From a cost avoidance perspective, by using the new process, the organization has avoided to host 100 individual program review board meetings which are estimated to cost approximately $20,000 each for a year to date savings of approximately $2,000,000.

CONCLUSION

The team main objectives were achieved and the new process exceeded the team expectations. The first pass yield was improved from 30% to 100%, which is mainly driven by the use of the standardized SR template that facilitates the supplier's ability to provide all information needed by the team to review and approve the changes. The average cycle time was improved from 114 days to 24 days. This improvement was mainly driven by the elimination of repetitive activities in the likes of peer reviews and engineering review board meetings.

In the near future, the next project phase would be to deploy the new process for all programs and suppliers to benefit from a streamlined and optimized process. In order to do this, the organization would need to socialize the project and leverage the project framework and lessons learned to facilitate onboarding additional suppliers with ease.

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