Continuous Improvement

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Value Stream Mapping

The Journey to Security, Resiliency and Reliability

Every year children around the world wait impatiently for the arrival of Santa to leave them all the wonderful gifts they wished for. Santa and his elves have a year to prepare for that one magical night to fulfill children's hopes and dreams of the newest video game console, the latest tablet, or even the classic Red Ryder Carbine Action 200-shot Range Model air rifle - just don't shoot your eye out! But as the world grows by millions of people each year, it is important for Santa and his elves to look at the process and see where inefficiencies can be reduced to ensure continued timely delivery of toys around the world. This type of analysis might look something like this.

Much like Santa having to deal with more complexity in the world, organizations from all industries should continuously adjust their processes to ensure they deliver high quality products efficiently. In our industry, examples include: how can you reduce the time it takes to prepare for an audit? Or, how can efficiencies be realized when you implement programs such as vegetation management or protection equipment maintenance? Value Stream Mapping is one way to improve any process, just like in the Santa's Workshop example linked above.

What is a Value Stream Map?

A Value Stream Map (VSM) is a tool used to visualize a process in enough detail to uncover where waste exists, how much time each process step takes to complete, the number of resources needed to complete the process, and much more. It is rooted in the Continuous Improvement (CI) concept of Lean Six Sigma which is an improvement philosophy that values proactively preventing defects over detecting them after the fact and promotes standardizing work

processes to reduce wasted time, according to the American Society for Quality. VSMs "facilitate clear communication and collaboration, encourage continuous improvement of a process, and enable culture change within an organization," according to an article by Purdue University. The focus is on increasing value-added steps and reducing non-value-added steps. Non-value-added time accounts for almost 50% of total time in many processes, according to Villanova professor Tina Agustiady.

To improve a process using a VSM, the first step is to depict the current state. Holding a Kaizen Event with an impartial facilitator usually works well when developing the VSM. This activity involves holding a brainstorming session focused on improving an existing process. You should include all the stakeholders of the process, set up one or more sheets of paper across a wall to give yourself enough room to properly draw out the process, and have a stack of sticky notes on which to write all the steps. You want to go from left to right, starting with the first step and working your way to the last step, while collaborating and having discussions throughout the event. You need to think about how long each step takes. You can come up with an educated guess based on experience, or if possible, you can also use employee timesheets to get a representation of the time associated with different activities. You need to know the number of personnel involved in the process, and the results of the current state may show not only waste that needs to be eliminated but a need for more, or less, personnel.

Analyze the Current State

Once your current state is depicted, then it is time to analyze the process. Where are areas of waste, a common one being waiting (e.g., a compliance department waiting for an SME to provide you with the needed compliance documentation)? You can identify steps that may be taking longer than they should and if they can be shortened. What are the bottlenecks and dependencies on external parties? In what areas do we need more resources, or can we maintain productivity with less resources?

This is also the time to get management that is already familiar with

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the process involved in analyzing the current state. They should review your VSM and assign numerical values for the steps, e.g., 9 for the "must have" value-added step, down to a 3 or 1 for those non-value-added steps. This will help measure the value of each step in the process.

Create the Future State

What do you want the process to look like, for example, when you want to reduce the time to get all the required documentation for a NERC compliance audit? Is there a system you can incorporate that makes this step more efficient, such as implementing a new database or replacing the current database for more efficient communication among departments? How can you improve how compliance evidence is stored and updated, including a quick feedback loop and request for information feature?

Maybe there are steps you need to add to make the process more robust – it's not always just about removing steps and reducing time – it's about value. Your protection equipment maintenance process may show the need for change to add critical steps, such as ensuring a relay is put back into service the way it was before testing and maintenance, adding safety instructions you may have uncovered from previous lessons learned, or adding steps to have another worker double-check that all testing requirements of NERC standard PRC-005 have been met.

You can also use a VSM to identify the need for internal controls. Internal controls can add value to any process. One example of a process that can be improved using controls is patch management required by CIP-007-6 R2. If you mapped out and analyzed the current state of your patch management process, you may see that integrating controls could help create an improved future state. For example, adding a

verification control where a secondary person reviews and approves the patch testing outcome to ensure accuracy before installation and validation could catch potential issues earlier in the process and save time overall. The future state, when implemented, is not the end of the process. It should be periodically reviewed due to changing conditions, hence the overall objective of continuous improvement.

We practice what we preach. And we can help!

The RF Entity Engagement group uses VSMs to see all the process steps within our core and project work, one example being the Assist Visit process. Although we start with the visualization like any VSM development, we customized it by transferring it to a spreadsheet that suits our purposes as a service organization and that includes cycle time calculations and how much we are utilizing our human resources.

We have several staff members who are trained in facilitation techniques in accordance with the International Association of Facilitators (IAF) through our RF Facilitation Community of Practice where members collaborate, learn, and practice facilitation techniques. This allows RF the ability to help entities develop a VSM and assist with a variety of other issues. If you'd like us to help you improve your process using VSMs, please contact us.

Thank you all for what you do to keep our grid secure, resilient, and reliable. Whether you celebrate Hanukkah, Kwanzaa, Christmas, or any other holiday this winter season, I wish a safe and happy holiday to all of you!

VSM Resources

The following are resources that provide more details about Value Stream Maps. They may include VSM examples with much more detail than you need for your process, so you can customize the VSM to your needs.

Value Stream Mapping:

- *How to Visualize Work and Align Leadership for Organizational Transformation: Book*

- *Mindtools: Value Stream Mapping*

- *American Society for Quality (ASQ): What is Value Stream Mapping (VSM)?*

- *A Lean Journey: Five Simple Ways to Make Your VSM A Valuable Improvement Tool*