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ACADEMIC Leader

Campus in Crisis? Process Optimization Can Help

Kathleen (Katie) Brown and Jessica de Perio Wittman ▪ December 14, 2020

Assessment, academic success, and retention are at the forefront of higher education. When budgets and programs are systematically reduced, higher education institutions can face these challenges by applying process optimization techniques. In times of crisis, cross-functional teams employing these techniques create direct change in higher education environments. This article provides college and university presidents, provosts, deans, and other senior leadership with a foundation on process optimization methodologies, such as Lean Six Sigma and Agile. It also also provides a primer for department and unit heads on the application of specific tools and techniques.

Step 1: Cross-functional teams must identify institutional issues

Academic leaders are facing significant upheaval and unprecedented challenges as a result of the COVID-19 pandemic. Universities and colleges must respond quickly and adopt methods to properly address the fluid nature of these challenges.

At first, most institutions created COVID-19 committees to specifically address how to reopen their campuses. But defining these committees as COVID-19 committees creates misperception that most, if not all, issues qualify as pandemic problems. Academic leaders must acknowledge that these committees are focusing on tackling a range of problems that upset business continuity. They must look beyond the COVID-19 umbrella and identify tangible issues or problems.

Process optimization is best implemented with a cross-functional team. A COVID-19 committee is a good example of a cross-functional team. Most of these committees already possess several stakeholders from various departments and units throughout the institution. Once created, the cross-functional team identifies individual issues and problems that affect day-to-day operations.

Step 2: Select a process optimization methodology

Once they have identified an issue, leaders must determine the most appropriate process optimization methodology and whether their issue can be measured using qualitative or quantitative data. Below are a few practices to choose from:

> **Six Sigma (quantitative):** A statistics-based methodology that uses quantitative models to address process improvement, Six Sigma incorporates a technique called DMAIC ("define, measure, analyze, improve, control"), which focuses on finding the cause of errors and mistakes by concentrating on reducing the discrepancies in outcomes. The Sigma represents the population standard deviation, which is a measure of the variation in a data set collected to analyze the process. The Six Sigma process mean is six standard deviations from the nearest specification limit.
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> **Lean (qualitative):** Coined by James P. Womack and Daniel T. Jones to describe their study of the Toyota Production System, Lean uses a technique called PDCA ("plan, do, check, act"), which focuses on assessing the value and need for a particular workflow to determine how to get rid of waste, rework, and downtime. Lourdes M. Slater (2019) states that the eight wastes of Lean are "Defects, Overproduction, Waiting, Non-Utilized Talent, Transportation, Inventory, Motion, and Extra-Processing (commonly referred as DOWNTIME)" (p. 42). "Repeatability and stability" are core tenets of Lean. By consistently collecting reliable data, universities and colleges can remove the anomalies that cause inefficiencies. By doing this, they will be able to streamline the workflow while still achieving the desired result and increasing productivity.
>
> **Lean Six Sigma (LSS) (qualitative and quantitative):** A process improvement strategy that combines the Lean and Six Sigma methods, LSS analyzes and evaluates processes while improving efficiency. LSS incorporates the DMAIC method. In LSS, the Lean technique's focus is on a team effort to reduce waste, while Six Sigma's focus is on analyzing statistical data and design to improve variation through reduction.
>
> **Waterfall project management (qualitative and quantitative):** In this approach, leaders tackle projects in a linear fashion by completing each distinct stage before proceeding. It is assumed that

each key step in the project must be completed before moving on. This structure works well with a predictable project, but it can add unnecessary time (waste) if there is potential for an unknown variable. This approach requires senior leadership to make a big plan up front and then execute. A phased campus reopening is an example of waterfall project management.

Agile project management (qualitative and quantitative): The Agile approach allows for the structure to evolve as the nature of the work changes. It employs a collaborative, leaderless team that spreads responsibility and accountability among various team members. Everyone collectively serves as the project manager. Developing and application of a contact tracing plan in real-time due to student behavior is an example of Agile project management.

Step 3: Identify the tools you will need to tackle the institutional issue

Each process optimization methodology comes with its own set of tools. The problem or issue will help determine which tools to use. Universities and colleges may also tailor the use of these tools to expedite a successful project.

Tool set 1: Six Sigma (SS), Lean (L), and Lean Six Sigma (LSS)

DMAIC is best used for optimizing and stabilizing specific business processes. It can be applied to existing processes, and it incorporates financial implications and project schedule development. (SS, LSS)

The **project charter** is part of the *D* or *define* stage in DMAIC. It enables a team to define the project, and it provides an overview and serves as an agreement between management and the team regarding scope, objectives, and participants. (SS, LSS)

A **Pareto analysis** separates out the vital few causes from the trivial many. The Pareto Rule is sometimes called the 80/20 rule because 80 percent of the problems are due to 20 percent of the vital causes or factors. This tool graphically separates the aspects of a problem to help a team direct its improvement efforts. (SS, LSS)

Supplier-input-process-output-customer (SIPOC) authenticates processes at a high level. It visualizes the process from the supplier's inputs to the products or services customers receive. (SS, LSS)

Process mapping (also known as **value stream mapping** or **functional flowcharting**) allows the entire organization to understand and agree on how to produce value in customers' eyes and how to identify where waste occurs. The map includes data points such as cycle time of processes, work in progress, and idle time. (L, LSS)

A **Kaizen** event is a three- to five-day planned team meeting, often across departments or projects. The team addresses inefficiencies in a particular process or addresses a specific problem in the PDCA cycle. (L, LSS)

The **PDCA** cycle starts with the *plan* phase, in which the team recognizes an opportunity and plans for change. The team then enters the *do* phase, in which they test the change. Often, testing is a small study. After completing the study, the team performs a *check* by reviewing the tests, analyzing the study, and identifying what is learned from the experience. In the *act* phase, the team decides on the action based on the results of the study. If the PDCA cycle is unsuccessful, the cycle is repeated with a different plan.

Alternatively, a successful PDCA cycle enables the team to apply what has been learned to a wider scope.(L)

A **cause-and-effect (or root-cause) analysis** allows teams to identify and explore all potential factors related to the root of the problem. Examples of causes include workforce, machines, methods, materials, or the environment. (L, LSS)

A **Kanban** system is a visual to-do list made up of segments that represent each work stage of a project. The goal is to not start a new project in a given stage until a prior project in that stage is complete. (L, LSS)

Rapid improvement workshops (RIW) focus on local processes to quickly tackle obvious problems or issues. (L, LSS)

Tool set 2: Waterfall project management

The typical steps in a Waterfall project are requirements, design, implementation, testing, deployment, and maintenance. First, the cross-functional team investigates and analyzes the business's needs and recommends solutions to the project manager. The project manager selects a solution. After receiving the solution, the team documents all the technical specifications, procedures, processes, testing criteria, and metrics required and then implements the solution, adhering to the specifications, procedures, and timelines that were laid out earlier. Following implementation, the team must test the deliverable against the standards and metrics determined for success during the design phase. If the deliverable fails, then the team revisits the implementation phase to identify errors. If the deliverable is successful, the team releases the deliverable to their users. The team would continue to maintain and support the project if issues arise.

Tool set 3: Agile project management

User stories reflect just-in-time customer needs and the reasons behind them. The storyteller addresses the need of the user in a simple format: "As a _____, I need to be able to _____, so that I can ____." Each blank identifies information necessary for the team to determine the best outcomes for the customer. For example, "As a student living on campus, I need to be able to safely obtain campus dining, so that I can make use of my purchased meal plan." The team would then use this user story to address the residency concerns of this particular student type.

Sprints allow teams to break their work into smaller tasks that they can complete within a fixed duration cycle.

Scrum is a series of rituals in which team members quickly check in with one another, provide assistance if needed, foster accountability, and provide retrospective updates on goal progression.

Agile boards (simplified Kanban boards) can be used to track progress throughout a project.

Step 4: Put it all together and move forward

To tackle current challenges, leadership should identify problems and decide on methodologies and tools best suited to tackle them. Cross-functional teams generate useful data for outcome-driven decision-making and future projects. Project management will then drive services, initiatives, and programs aimed at improving the entire institution. When done properly, process optimization enables leadership to open

up a dialogue with department and unit heads to uncover areas of improvement and facilitate a better experience for the campus community.

Reference

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