

Calyptus Group
Process Improvement Methodology

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The Challenge

Today's global marketplace is characterized by sophisticated, demanding customers that require higher quality products and services at lower cost. In attempting to satisfy these customer needs and expectations, most companies quickly realize that simply working harder within the constraints of existing operating systems is not enough to remain competitive. Even recognized industry leaders that enjoy high market shares and impressive profits acknowledge that in order to be successful in today's marketplace, they need to reassess, in detail, how their companies operate and focus on achieving continuous improvement in every aspect of the organization. This is true regardless of whether the focus is on internal or external processes.

The Process Versus Functional Approach

Most organizations are designed to efficiently group related functions (marketing, engineering, operation, sales, finance). These traditional, functionally oriented companies tend to maximize functions while assessing the resulting effect on the company overall. They often have communication, rewards, and loyalty flowing vertically to optimize the function, and their control systems measure the effectiveness of products or services by inspecting the output and developing elaborate quality-related operations to fix the output prior to delivery to the customer.

By placing emphasis on each function independently, such companies hope to enhance the entire operation. However, work that flows through a company is highly interdependent. The marketing function, for instance, may wish to increase product sales by reducing price. This approach can only work, however, if the organization can deploy the operations to meet additional orders; if purchasing can supply the resources; and if engineering, distribution, product or service support, and finance collaborate to increase sales.

Typically, functionally oriented companies underutilize the entire organization system, and create waste, complacency, communication breakdowns, fire fighting, errors, needless costs, frustration, and, ultimately, dissatisfied customers. In contrast, the concept behind the process improvement approach is that a organization is made up of a number of cross-functional and interrelated processes, sub-processes, tasks, and subtasks that add value to resources (people, material, equipment, and methods) and transform them into outputs (products, services, and information) designed to satisfy customer needs and expectations. It is the effective blending and collaboration of these functions that allows a company to effect overall improvements that will result in increased customer satisfaction and productivity.

Communication, reward systems, cooperation, trust, and teamwork in process-oriented companies tend to flow vertically, horizontally, and diagonally. The proven results of this process orientation are satisfied customers, committed and satisfied employees, high quality, low cost, and high-value-added processes.

Origins Of Process Improvement

The process improvement concept is based on the works of Dr. W. Edwards Deming, Joseph M. Juran, Armand V. Feigenbaum, and others who have applied the systems approach to management along with problem solving and statistical techniques. Much of their work was based on the efforts of Walter Shewhart, a physicist with Bell Labs in the 1920s, who focused on bringing processes into statistical control by reducing variations over time. Under Juran's and Feigenbaum's concepts, every department and individual in a company is included in a commitment to continuous improvement that focuses on reducing variation, eliminating non-value-added work, eliminating waste and rework, and emphasizing satisfaction of customer needs and expectations.

Dr. Deming was instrumental in applying these techniques in Japan after World War II, where he was able to assemble many of the key industrialists and sell them on the process improvement approach. While much of Western industry focused on meeting specifications and standards, Japanese industry focused on continuously improving the effectiveness of every process of the organization and meeting customer needs and expectations in order to gain leadership in world markets. The coveted Deming Prize is awarded each year to the Japanese firm that has contributed most to continuous improvement and total quality management. In the service industry, companies such as Federal Express, Almerica, Ritz-Carlton Hotels, Bank of America, and Citibank, have embraced process improvement as the method to deliver world-class results.

What Is Process Thinking?

Everything a company does is part of a process. A process is defined as any interrelated group of work activities that receives inputs from a supplier and blends resources to transform and add value to the inputs in order to produce a product or service to meet customer needs and expectations. Many of these processes cross-functional boundaries and involve both internal and external customers and suppliers. A process or systems view of a company suggests that it is essentially a network of interdependent processes that flow horizontally across organizational boundaries rather than a group of independent, "vertical" functions.

One way to illustrate the process approach is through the conceptual Continuous Improvement Model (see Exhibit I). This model has three key elements: the process itself, the customers of the process outputs, and the suppliers of the process inputs. The goal of the process shown in the model is to meet both the current and future needs of the customer. A continuous feedback loop ensures that the process outputs continually meet customer needs and expectations and that the process itself is continuously made more effective and efficient.

The first step in process improvement is to clearly define the process to be improved and use data to verify why the process is in need of improvement. The next step is to identify the customers of the process output and determine their needs and expectations.

These customer requirements are then translated into process output targets. The process generates outputs that are measured against these output targets using data analysis. If the targets are met, it is likely that the customer needs have been met.

After the process output is given to the customer, feedback is requested to determine whether the customer is satisfied with the output (as represented by the intersection of the process output and customer requirement circles on the model). If the customer is not satisfied, an investigation must occur to determine why this is the case. This new information can be used to generate revised process output targets and to suggest new process improvement opportunities. In many cases, in order to meet customer requirements, the process requirements of upstream suppliers must be changed, which means that suppliers must also improve their processes to provide the required inputs.

Process Improvement Principles

There is a customer-driven orientation and culture. Process improvement requires that people consider who their customers are, what their needs and expectations are, and how the process can be designed to meet them.

Everyone is a customer and a supplier. Everyone in an organization must think of his or her involvement in a process as both a supplier (supplying products, services, and information to downstream customers) and a customer (receiving products, services, and information from upstream suppliers).

Process improvements are data driven with the objective of reducing variation. Decisions to improve processes must be based on a thorough understanding of process variables. This requires collection, measurement, and analysis of process data. The data provided allow good process improvement management decisions and actions.

Process improvement requires total involvement and teamwork. Since everyone in the organization works within processes, it is everyone's job to help improve those processes. Process improvement responsibility cannot be delegated to a staff function off line from the process. Effective process improvement requires involvement from cross-functional teams.

Management's job is to improve processes. An employee's ability to perform as required to meet customer needs is dependent on the capabilities of the process. Thus, management must take action to improve the process rather than place blame for problems on employees.

Management systems and climate support encourage process improvement activities. Management must establish an environment that supports and encourages process improvement. In addition, management systems, strategy development, reward systems, performance evaluation systems, and financial systems, must encourage and be consistent with process improvement.

Continuous process improvement is an established discipline. A consistent process improvement methodology must be understood and used throughout the organization. A disciplined process improvement methodology will help to facilitate communication, instill a common language, and set the stage for optimizing cross-functional process improvement.

The Guidance Management Team

Process improvement (PI) is most effective when conducted with the guidance and support of top managers, who select process improvement opportunities that support overall company organization objectives and customer needs and expectations.

Typically, upper management creates a guidance management team made up of key process stakeholders managers who affect or are most affected by the process. This guidance management team, headed by a guidance management team leader, analyzes the process through the use of logic and data, clearly defines and initiates the process improvement effort, and selects the PI team leader and team members. After a formal kickoff meeting to ensure the PI team understands its objectives, the guidance management team provides continuing guidance and support, conducts periodic progress reviews, and helps the PI team take action to implement its recommendations. Much of the success of the PI team is dependent on the guidance management team's ability to secure the commitment of key stakeholders. These stakeholders must allow PI team members adequate resources and time to attend the team meetings and to conduct the necessary data collection and analysis off line from the meetings. These stakeholders must also resolve conflicts and remove barriers or obstacles that interfere with the success of the process improvement project.

The Process Improvement Team Leader

The process improvement team leader is selected by and responsible to the guidance management team. He or she directs the process improvement team throughout the project and works with the guidance management team to ensure that the PI team is properly oriented toward its process improvement effort. The PI team leader also coordinates the training of team members on the 6-Step Improvement Model, which, once understood, is used by the team as a guide for conducting a thorough analysis of the process and envisioning, recommending, and implementing the improved process. This individual also serves as the primary liaison to the guidance management team, ensuring that the PI team is adequately prepared for its periodic progress review meetings.

Since the PI team leader oversees the PI team meetings, he or she must be knowledgeable in the areas of process thinking, the use data to understand and analyze the process, and the basic process improvement tools. Furthermore, since the leader is charged with the specific responsibilities of motivating the team members, surfacing and resolving internal team issues, enforcing the process improvement discipline, and developing and maintaining a PI plan through scheduled (generally weekly) meetings, he or she must be recognized by the team as having clout and group dynamics skills.

Process Improvement Team Members

The PI team members (who represent their stakeholders) are selected across functions on the basis of their participation in the process, their knowledge of how the process currently works, or their specialized knowledge in a particular area (such as customer order management or accounts receivable). Generally, the scope of the effort is bounded in such a way that the team has fewer than 10 members.

6-Step Improvement Model

The 6-Step Improvement Model (see Exhibit II) is a structured series of steps used to implement the Continuous Improvement Model. The guidance management team uses the model to define and clarify the process improvement project. The process improvement team also follows the model as a disciplined process improvement methodology.

Many times, as process improvement teams conduct their analyses, they uncover additional information that necessitates rethinking or revalidation of tentative conclusions made in previous steps. This continuous feedback ensures that the team's analysis at each step builds on and revalidates the analysis at previous steps. Some of the issues raised in a particular step may overlap with those considered during a previous step; however, the redundancy is intentional to ensure that new information can be used to revalidate previous conclusions. A brief description of these seven steps is presented below.

Step 1: Select the Process

It is in Step 1 that the process improvement team is formed and the guidance management team conducts the initial "kickoff" meeting to initiate, orient, and direct the process improvement team. Typically, the guidance management team will have identified the process improvement opportunity and what it hopes the process improvement team will accomplish. The guidance management team should have assembled preliminary, high-level data to support the reasons for selecting the project such as to improve customer satisfaction, to improve process effectiveness or efficiency, or to apply new or competitive discriminating technologies.

The process improvement team then takes steps to further understand the nature and objectives of the project, verify the existing data, and collect other data as necessary to better understand why the process needs improving and the value the improvement will bring to the customers and the company. The PI team then develops its preliminary goals and a work plan to implement the process improvement project. Calyptus Consulting advises clients that projects should be structured to be completed within 4-6 months. At this point, the PI team is ready to move to Step 2: Current Situation.

Step 2: Describe the Current Process

In Step 2, the PI team attempts to understand the characteristics of the current process and how significant and widespread the process problems are. The PI team collects data to answer questions such as "Where are the process problems?", "What is the magnitude of the process problems?", and "In what areas and how much have the customers complained?" "Why does it take so long to process an order from a customer?" It is important to consider what measurements are selected, how the data are

collected, the timing of data collection, and the measurement tools selected. It is also important to define the problem as a process -one that typically involves many functions. The PI team bounds the process with a specific beginning or "trigger" and a specific ending -- resulting in a well-defined output.

The team then develops process flowcharts that outline how the process currently works, detail the structural flow of the sub processes that make up the process, and identify the organizations involved in the process. These boundaries are adjusted, as necessary, with approval of the guidance management team to ensure the process improvement project is manageable. The PI team also identifies the customers of the process (external and internal to the process), determines their needs and expectations, and tries to understand the level of customer satisfaction.

A thorough understanding of the process is possible only when the factors that influence its outputs are defined, measured, and understood. During this analysis, process weaknesses are identified in terms of both the flow of the process (non-value-added tasks) and the performance of the process (sub processes that are not performing as designed). Once the process problems and weaknesses are fully categorized and verified, the PI team can move to Step 3: Problem Analysis.

Step 3: Analyze Causes

In this step, the PI team conducts cause-and-effect analysis to determine the root causes of the process problems detailed in Step 2. As the analysis points to potential causes or symptoms, the PI team collects and analyzes additional data to narrow the causes to the most significant ones. Many times the PI team may have to conduct a small test to verify the cause-and-effect relationship.

At the conclusion of Step 3, the PI team prepares a formal presentation to the guidance management team using extensive use of logic, data, statisticals, and techniques, and diagrams. Upon approval from the guidance management team, the PI team moves to Step 4: Solutions to begin to develop, evaluate, select, and implement an improved process.

Step 4: Define Potential Solutions

After the PI team examines the reasons for the process problems and supports its findings with data in Step 3, the PI team uses its knowledge of the process and the needs and expectations of the customer to put in place an improved process. First, the PI team develops an evaluation and selection plan that establishes the criteria for evaluating various process improvement alternatives. The team then uses envisioning techniques, such as brainstorming, to generate alternative solutions that will eliminate causes and process weaknesses, effectively and efficiently improve the process outputs, and satisfy customer needs and expectations. The PI team further develops these alternatives (perhaps combining ideas), evaluates them against the evaluation criteria, and selects the best alternative. Consensus decision-making tools are used to reach agreement. This recommendation, along with adequate supporting data from the evaluation process, is presented to the guidance management team.

Step 5: Implement the Recommended Solution

Upon approval by the guidance management team, the PI team designs and conducts a pilot of the improved process. It then collects data to evaluate and verify the process improvement or it reevaluates the alternative solution or pilot implementation of the pilot is less than successful.

Once a successful pilot has been run, the PI team develops a detailed implementation plan, considering the procedural and organizational barriers that must be addressed. Once the implementation plan is approved by the guidance management team, the improved process is implemented within the organization. During the implementation period, the results of the improved process must be verified.

The PI team remains intact during the implementation period to ensure that the improved process is performing as expected. The process improvements are verified through feedback and data to ensure the process continually meets customer needs and expectations. The process outputs are also evaluated against the process output targets to ensure that the process itself is running smoothly. Minor adjustments in the process may have to be made and then observed to understand the impact of the outputs. Once the process is stable and the results are predictable, the PI team moves to Step 6: Process Standardization.

Step 6: Standardize the Improved Process

The PI team is responsible for ensuring that the support systems within the company that allow the process to function are coordinated and compatible with the improved process. If the support mechanisms, such as procedures, policies, and training, are outside the realm of the PI team, the PI team must raise the issues through the guidance management team and push to get them resolved. In many cases, particularly where company procedures are in need of modification, these procedural issues must be resolved in Step 4: Solution Development prior to implementing the process.

As an additional action in Step 6, the PI team develops and leaves in place an ongoing process measurement system to ensure that participants in the process are measuring the process effectiveness and level of customer satisfaction on a continuing basis. The PI team will reassemble periodically to monitor the process and ensure its stability.

PI Tools and Techniques

Process improvement requires the disciplined use of fairly simple, commonsense quality management tools. For most PI efforts, the seven basic tools are used in conjunction with structured problem solving to define processes, identify opportunities for improvement, and assess the effectiveness of process improvements.

Flowcharts

Flowcharts visually depict the process as a series of steps with start, stop, and decision points.

Cause-and-Effect Diagrams

Cause-and-Effect Diagrams (fishbone charts) structure the cause-and-effect relationship of complex problems. The effect or problem is established and the causes, broken down into categories (such as people, methods, equipment, materials, and environment), are created to assist in defining the cost curve of problems. This technique is particularly effective when used to organize brainstorming sessions. When identifying the causes of problems, it is effective to ask "Why" up to five times to get to the root of the problem -- rather than to simply identify a symptom.

Pareto Charts

Pareto Charts are used to categorize events that are displayed in order of relative magnitude. This approach helps to visually prioritize the most vital categories.

Scatter Diagrams

Scatter Diagrams display the correlation of two characteristics to see whether the variables are related. They are used to determine the extent of the cause-and effect relationship between two variables.

Histograms

Histograms are used to display the frequency distribution of events so as to show the amount of variation in a set of data taken from a process.

Run Charts

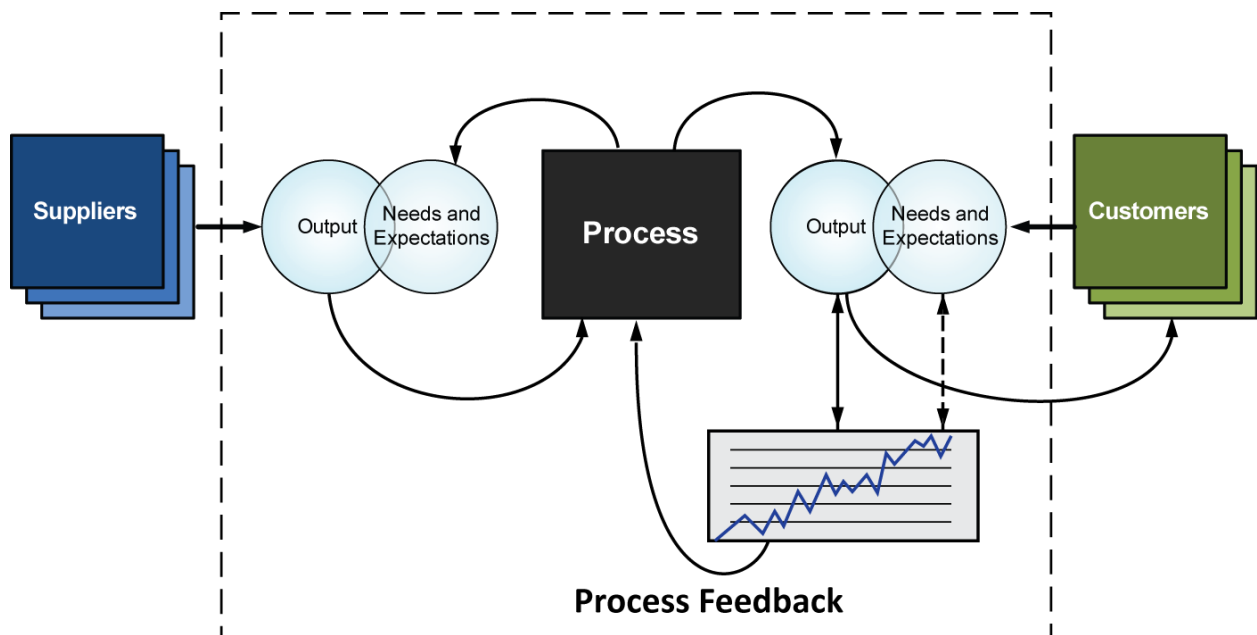
Run Charts are used to plot process measurements over time. Run charts display how a characteristic of the process performs over time, what the average is, and whether there appears to be a trend in the process over time.

Control Charts

Control Charts are run charts with statistically derived control limits. Control charts display the way the process currently performs. They are used to determine whether the process is consistent or stable and how much the process varies over time. If the process is stable but is not performing as expected, management must take action to change the way the process is performed. Results must then be monitored on a control chart to see whether improvement was made.

Lean management and six sigma techniques are also used where appropriate.

Exhibit I Continuous Improvement Model



Potential Management Steering Committee Actions in Support of CI Teams

