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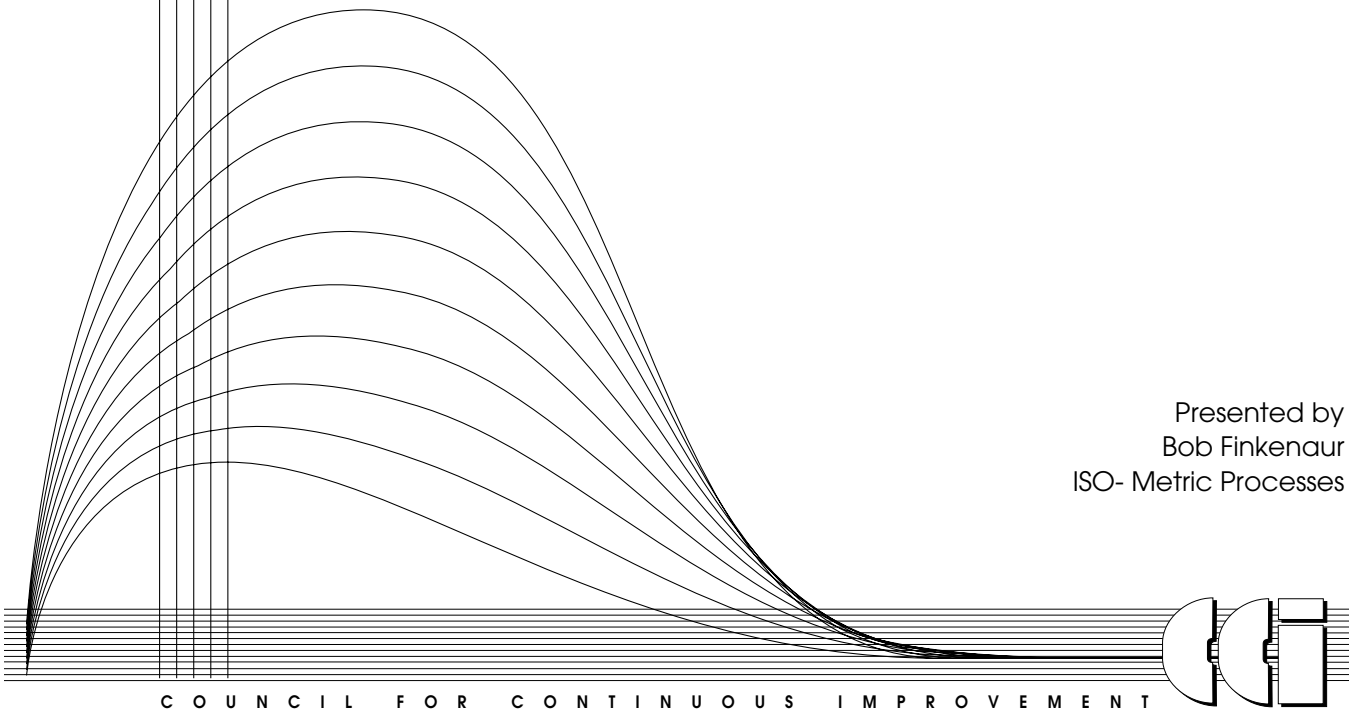
Process Management and Cycle Time Reduction



Presented by
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ISO- Metric Processes

COUNCIL FOR CONTINUOUS IMPROVEMENT

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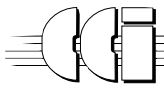
Executive Summary

Bob Finkenaur of ISO-Metric Processes describes the application of process management tools to the challenge of cycle time reduction in all functional areas. In an exercise, participants are challenged to reduce cycle time of an example process by 70%.



Process Management and Cycle Time Reduction

When Bob Finkenaur, a principal of ISO-Metric Processes, addressed a breakout meeting on the topic of process management and cycle time reduction at the April 1995 General Session of the Council for Continuous Improvement (CCI), he emphasized that his teachings were based on several fundamental truths: Total quality management (TQM) targets the processes in all functional areas of an organization. The employees who work in a given process are the real experts on improving that process. Customers, in addition to being the source of the paycheck, are also the most valuable advisors and mentors for an organization.

Most people are interested in process management in relation to ISO 9000 certification, Mr. Finkenaur suggested. "ISO 9000 is about documenting your processes, implementing what you have documented, keeping records to show that you have implemented those processes, and regularly reviewing and improving your processes."

Mr. Finkenaur, however, considers cycle time reduction (CTR) to be the most significant benefit of process management. Cycle time reduction provides the most wide-spread benefit to a company, reviving faltering operations or preventing trouble in the first place. "Why is cycle time so important? Why do I push it so hard? Everything in a healthy company cycles. Hiring, happens again and again. Training, likewise. Developing new products and projects. Manufacturing products over and over. Calls from the customers. Sales order processing. The moment it stays still, that's a bad day. We're talking about hundreds of operations that repeat themselves. A small amount of wasted time in one iteration of one of those cycles — what's the big deal? But, when you consider that the small amount of wasted time is repeated many times over the year, now that small amount of wasted time grows."

In spite of what its detractors may say, cycle time reduction does not mean working harder, longer, faster, or with reduced quality, Mr. Finkenaur emphasized. "Reduced cycle time environments actually produce better quality," he said. "CTR means working smarter. I'm really talking about taking these processes that cycle over and over again, and optimizing them by taking out the wasted time, the non-value-added activities. That's how we get cycle time reduction. Process management is the tool we use to do that."

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Benefits of Cycle Time Reduction

For those still unconvinced, Mr. Finkenaur presented an extensive list of the benefits of cycle time reduction: improved quality and reliability, reduced inventory, lower costs and higher margins, shorter time to market, firmer sales forecasts, increased effectiveness of the sales force, vastly improved white collar productivity, acceleration of process improvement, significantly improved use of assets, elevated customer satisfaction, greater market share, and a healthier company.

Cynics attack the idea that cycle time reduction improves quality and reliability, Mr. Finkenaur noted, but removing unneeded steps from a process also reduces the opportunity for defects to be introduced. Furthermore, in an unoptimized process (especially in manufacturing), products are more likely to be damaged on the production line due excess handling and exposure. Reduced cycle time also increases the opportunities to learn from the manufacturing cycle and apply those lessons to improving future product generations faster. The accelerated results also generate deeper support for the TQM process. All of these effects lead to improved quality and reliability.

Relating cycle time to inventories, Mr. Finkenaur suggested that inventories have been important for providing spares for backup because of low product reliability. With improved reliability, the need for spares (and inventory) will be decreased. In addition, cycle time reduction usually results in the acceleration of the manufacturing process, which means less "finished goods" inventory. "If you're going to be able to ship product faster (because it takes less time to build it), you can react faster to the orders when they come in. When you have less finished goods inventory and less material or product going through the manufacturing cycle, you have less raw material and parts inventory."

Cycle time reduction helps lower costs (thus increasing margins) for many of the same reasons. Shorter cycles mean reduced per-cycle labor cost. Reduced development cost is another significant benefit. Improved quality and reliability means less rework and scrap costs. In a short cycle time culture, cost reduction programs produce their results faster.

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"90% of people would say shorter time to market defines cycle time reduction," Mr. Finkenaur said. "I'm not saying that isn't so, but it is only one benefit of cycle time reduction. It is a result of a decreased development cycle, and it is also the result of our improved ability to see customers' actual requirements for the product, producing fewer design changes in mid-stream. Shorter time to market also means introduction of the new product under reduced pricing pressures and a longer participation in the market window."

With reduced cycle time, customers will not need to estimate their future requirements as far in advance, so sales forecasts are likely to be more accurate. The effectiveness of the sales force will also be increased because they will spend less time monitoring the progress toward delivery and less time processing customer sales order changes.

"Cycle time reduction can vastly improve the productivity of your white collar workforce," Mr. Finkenaur said. "An improvement on the order of magnitude of 105% is possible (going beyond an individual department into other operations). Only the white collar process can take a communication which goes around the world in a second and keep it from getting to your office for two days, right?"

The use of assets is significantly improved by CTR, Mr. Finkenaur noted. "We now have less cash tied up in inventory, development projects, and receivables (or we have cash tied up for less time). One of the projects you will work on in process management is your accounts receivable process — you will get receivables in faster. One of the goals that is now being seriously pursued by many American companies is the idea of *zero working capital*. Working capital is the cost of inventory plus receivables minus payables." To illustrate the trend, he presented a chart from Fortune listing companies on the road toward zero working capital (in order of how long they have been pursuing this goal) from Quaker to McDonnell Douglas, who just launched the effort [*see Mr. Finkenaur's handout, reproduced as attachment 9504.06a*]. Using inventory reduction to reduce working capital will produce a one-time cash infusion into the company. In addition, the interest expense for borrowed working capital funds will be permanently reduced.

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"The most glorious thing of all about this is the improvement it gives you in customer satisfaction," Mr. Finkenaur said. "When you are able to reduce your manufacturing and development cycles down to the shortest amount of time, the customer sees you as far more responsive — indeed you are. With a shorter waiting time for the product, the customer will find fewer reasons to change the order; this reduces the possibility of configuration errors from the changes to the order." CTR yields shorter response cycles and improved up time, while reducing the spares inventory required by the customer. These factors add up to reduced cost of ownership for the customer. All of these customer benefits should, in turn, lead to increased customer loyalty and greater market share.

Mr. Finkenaur presented a list of ranges of typical cycle time improvements taken from a book by Philip R. Thomas, called *Competitiveness Through Total Cycle time — An Overview for CEOs* [*see attachment 06a*] to illustrate results that attendees might expect from cycle time reduction efforts.

Assessing Processes

The potential for cycle time improvement in an organization can be unlocked with the key of *process management*, Mr. Finkenaur emphasized.

Citing Rummler and Brache's book called *Managing the White Spaces on the Organizational Chart*, he noted that most companies are organized in vertical silos based on functions like marketing, engineering, service force, manufacturing, etc. At the top of each function is a manager or director who feels great ownership of that organization. As a result, within its boundaries that organization usually works well. The problem arises because, for most of the processes in the company, no single organization is responsible for the entire process. New product development, for instance, involves marketing, engineering, manufacturing and service.

"In the vernacular of process management," Mr. Finkenaur said, "we have a problem of 'hand-offs.' When the process is handed off from one function to another, problems occur. *White spaces* in the organizational chart are places where hand-offs occur and problems result."

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Process management begins with the decision as to which process to improve. Mr. Finkenaur listed four critical factors to consider when making that decision:

- Highest importance to the customer
- Highest impact on the business
- Greatest need for improvement (what hurts the most)
- Greatest opportunity for improvement (the greatest improvement for the least effort and expense)

He recommended using a matrix to prioritize processes for improvement [*see attachment 06a*], taking each process and rating its importance (on a scale of 1–5) in terms of each of the four factors.

Mr. Finkenaur uses a three-phase process for continuous improvement: assessment, analysis, and improvement. "Once you know which process needs fixing, you find out how bad it really is, analyze the source of those problems and decide what you need to do about them, then develop and execute your improvement plan."

The assessment phase begins by determining the customers' problems with the process output and establish the priorities for improvement. "You are going to ask the customers what their priorities are for you to fix," Mr. Finkenaur said. "Then you will walk through that process and figure out exactly how it works today. You're going to collect improvement recommendations from the process participants (who are your employees) while you document the process as it is.

Mr. Finkenaur recommends using a time-based process map to document the process [*see attachment 06a*]. This map has x and y axes, with the x axis being time. "You divide the y axis into rows, assigning each row to one of the process participants. You can see in the handout that we have given the first row to the customer, the second to the marketing representative, the third to systems engineers, and so on. Then the process is described as you move to the right. There is no question about who is doing each step — you can tell just by looking at it. You can tell the order in time that the process follows. Because we assume time moves to the right, this step occurs after that step. We can see that these two steps occur simultaneously, because they're right above each other. I recommend this technique." [*See Proceeding 9407.10, "The Power of Process Mapping," for a detailed discussion of a similar technique.*]

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Process Analysis

The second phase begins by examining the process map to identify opportunities to improve the flow. "This exercise is where the bulk of your cycle time reduction possibilities are found," Mr. Finkenaur said. (Root-cause analysis is used for individual steps in the process that show internal performance problems, he noted, but the greatest cycle time opportunities are in the process flow from step to step.)

The flow analysis looks for missing steps, redundant steps (not necessarily repeated steps, but two steps performing the same function), or steps out of order. Next hand-offs are analyzed. There should not be too many organizations involved, and hand-offs should be well defined. Each internal customer/supplier pair should have a written specification.

Next the analysis examines whether any serial steps should be converted to parallel steps or if parallel steps should be converted to serial steps [*see example charts in attachment 06a*]. "The benefit of a parallel flow is that many different functions are involved. The disadvantage is that there are too many hand-offs."

Adjacent process steps separated by long physical distances represent another potential area for cycle time reduction. If the distances can't be reduced, perhaps the number of trips can be minimized. Some processes may be compressed vertically or horizontally [*see charts in attachment 06a*].

Flow analysis also looks for bottlenecks in the process, such as batching practices, steps where lack of information or material stops the process, or steps with extraordinary or erratic processing times.

By far the most significant cycle time reduction, however, comes from eliminating non-value-added steps. Mr. Finkenaur played a videotape from the American Management Association to expand on the concept of identifying and eliminating non-value-added steps. The video claimed that as much as 75% of the time can be taken out of almost any process by eliminating non-value-added steps. It listed three criteria for qualifying a step as "value-added." First, the step adds value if the customer recognizes it as important. Second, it adds value if it physically changes the thing — not just moving it from one in-box to another, filing it, or copying it. Third, value is added if the step is done right the first time. According to the video, only 10%-15% of the steps in a process add value, and those steps typically represent only 1% of the time in the process, so eliminating 75% of the time in a process is not a far-fetched notion.

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Mr. Finkenaur listed examples of non-value-added steps [*see attachment 06a*]. "The value is added to something the first time you touch it. If it comes back through because you didn't do it right the first time, you aren't adding any further value. Auditing, checking, and inspecting are all 'just-in-case' steps. Don't put in time consuming steps, get rid of the things wrong that require you to check." He presented a chart showing two extremes of testing: after each step in a long sequence, or only at the end of the sequence. More effective than either extreme, he suggested, is a strategy of identifying the step most likely to cause problems and checking only that one. "Do you really need checking steps at all?" he asked. "Is the cost of checking for it more expensive than what we're trying to prevent from happening?"

From this process analysis comes a recommendation for improving the process — an action plan for implementation. "At some point in time — six months or a year later — in the spirit of total quality and total continuous improvement, you look at it again to make sure that the things you did actually produced the improvements you were hoping for."

Exercise

Mr. Finkenaur presented an exercise based on a fictitious company called Productivity Improvement Products, Inc., or PIPI, which designs, produces, and markets training materials. "PIPI sells a series of five-day training courses focused on enhancing the productivity of their customers' operations," Mr. Finkenaur explained. "The training is delivered by an employee of the organization who is trained to conduct a course. Customers have asked them to work on their lead time. PIPI's president has asked us to work on their order processing process."

Mr. Finkenaur drew a process map as he explained the process in detail for participants. He asked them to look at the process map for any redundant steps, opportunities to convert serial to parallel steps, bottlenecks, non-value-added steps, checking steps that could be eliminated, or any other opportunities to reduce the time length of the process. He gave them worksheets and allowed 15 minutes to analyze the process and redraw the process map. "Show how you would reorganize the process and tell us what the improved cycle time is, in terms of work-days."

In their analysis of the process, participants found redundant forms that required unnecessary reconciliation, serial steps in finance that could be performed in parallel, as well as bottlenecks and checking steps that could be eliminated.

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One step in the process that generated discussion was the credit check. "Do you really need to do a credit check?" Mr. Finkenaur asked. "Go back and look at how many times your customers have failed to pay you in the past. When they did, how much did it cost you? How much is it costing you to pay the salaries of a group of people who are checking on those things? You've got to check that."

Conclusion

The prizes of process management, Mr. Finkenaur concluded, are the ISO 9000 registration and cycle time reduction. "There is little you can do for your company that would help it in a broader way than cycle time reduction," he emphasized. He reiterated the substantial time savings that are available (from 20% to 105% in various processes).

Recommended Reading

Competitiveness Through Total Cycle time: An Overview for CEOs, by Philip R. Thomas

Managing the White Spaces on the Organizational Chart, by Rummler and Brache.

attachments

9504.06a Mr. Finkenaur's handouts