

# Selecting Six Sigma Projects

Sometimes just determining which projects to undertake isn't enough.

Six Sigma is project-intensive. Large firms, such as General Electric, report completing as many as 7,000 Six Sigma projects in a single year. Even much smaller companies can complete several hundred projects per year. But this should come as no surprise, as projects are the means by which Six Sigma converts knowledge into bottom-line results.

However, not all Six Sigma projects produce bottom-line benefits; many produce only local improvements. In my June column I described how to use the theory of constraints (TOC) to decide where in the process to conduct Six Sigma

projects. But we need to go even further. In addition to telling us where to conduct Six Sigma projects, knowing the process constraints also helps us determine

what the focus of the project should be.

Six Sigma projects address three different areas of potential improvement: quality, cost and schedule. Critical characteristics in the product, process or service are identified using CTx notation: Critical-to-quality characteristics are designated CTQ; critical-to-cost, CTC; and critical-to-schedule, CTS. This classification scheme, combined with the TOC, can help focus Six Sigma projects by defining project deliverables in terms of their impact on one or more CTx characteristics.

Consider the simple process in Figure 1. The process is producing a product for which there is a market demand of 20 units per week. However, the best this process can deliver is seven units per week because that's the best step C can do.

Applying the TOC strategy described in the June column, we know that Six Sigma projects that affect step C should be given priority, those affecting steps D and E second priority, and those affecting A and B third priority. This tells us where

to focus our efforts. The CTx information can help us determine what to focus on.

Assume that you have three Six Sigma candidate projects all focusing on process step C, the constraint. The area addressed is correct, but which project should you pursue first? Assume that one project will improve quality, another cost, and another schedule. Does this new information help? Definitely! Table 1 shows how this information can be used.

Projects in the same priority group are ranked according to their impact on throughput. The same thought process can be applied to process steps before and after the constraint. The results are shown in Table 2. (Note that Table 2 assumes that projects before the constraint don't result in problems at the constraint.) Remember, impact should be measured in terms of throughput.

Knowing the project's throughput priority will help you make better project selections among project candidates. Of course, the throughput priority is just one input into the project selection process; other factors—for example, integration with other projects, a regulatory requirement or a better payoff in the long-term—may lead to a different decision.

### About the author

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Figure 1: A Simple Process with a Constraint

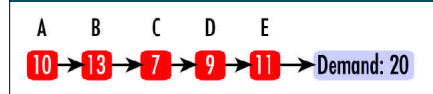


Table 1: Throughput Priority of CTx Projects That Affect the Constraint

Project Type	Discussion
CTQ	Any unit produced by the constraint is especially valuable because if it's lost, additional constraint time must be used to replace or rework it. Because constraint time determines throughput (net profit of the entire system), the loss far exceeds what appears on scrap and rework reports. CTQ projects at the constraint have very high priority.
CTS	CTS projects can reduce the time required for the constraint to produce a unit, which means that the constraint can produce more units. This directly affects throughput. CTS projects at the constraint have very high priority.
CTC	As the constraint determines throughput, the constraint's downtime results in lost throughput for the entire system. This makes the cost of constraint downtime extremely high. The cost of operating the constraint is usually miniscule by comparison. Also, CTC projects often have an adverse effect on quality or schedule. Thus, CTC projects at the constraint are low priority.

Table 2: Project Throughput Priority vs. Project Focus

	CTx	Before the constraint	At the constraint	After the constraint
Characteristic addressed is critical to...	Quality	*	***	***
	Cost	**	*	**
	Schedule	*	***	**
		*	Low throughput priority	
		**	Moderate throughput priority	
		***	High throughput priority	