Six Sigma and Service Operations

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Six Sigma methods were mainly applied in areas of manufacturing when first introduced. Soon, many recognized that such methods offered opportunities in non-manufacturing areas. For example, Motorola and General Electric realized billions in savings using Six Sigma methods in manufacturing—billions were also saved in many service areas. Any company can design and manufacture best-in-class products, but may still cause customer dissatisfaction by sending invoices with incorrect prices. Service industries, such as health care, education, government, publishing, sales, banking and insurance, can dramatically improve business performance by simply improving in-house processes.

Improving Service

Manufacturing operations offer tangible products for customers—process output is visible and may be touched and experienced. However, service operations deliver an intangible product to customers. Service operations waste far lest material than many manufacturing facilities. Six Sigma tools may be deployed to solve complex manufacturing problems, but may not be required to achieve dramatic improvement in a service environment. However, basic principles of Six Sigma methodology are equally applicable in service operations.

Motorola applied Six Sigma principles in publication, sales, corporate accounting and legal departments. Six Sigma has also been applied in warehouse, distribution, payroll and human resource departments in many other companies. Citibank once worked with Motorola University to apply Six Sigma in its banking operations—waste was minimized, errors were prevented and customer response time significantly improved.

Practical Application

To apply Six Sigma methodology to service operations, begin by defining services offered and what services are expected by the customer. Service must be defined so that performance may be measured and to ensure that customer requirements are met. Second, understand the intended customer base and their expectations. Expectations can be categorized into three areas—basic, competitive and delight. Basic expectations include a high level description of the requirements that should be understood by the supplier. Competitive expectations include requirements communicated by the customer in a quantifiable and measurable manner. Delight expectations include the anticipation of future customer needs—innovative solutions for customer convenience that go beyond customer expectations. The understanding of each of these categories is essential when creating value for the customer.

Next, identify what the service operation needs to fulfill customer requirements and create delight. Establish quantifiable characteristics of each need to ensure that all requirements are met. Such needs could include: information or material; machines or tools; hardware or software; methodology or procedures; and employee training.

To drive dramatic improvement, consider the purpose of the operations' service and customer needs to establish a baseline—include the understanding of current process flow (constraints and performance levels). Evaluate all aspects of the service process: efficiency; cost; time-to-deliver; and non-value added activities. Review various performance parameters that relate to delivery of service throughout the operation (Table 1).

Steps	Time to Complete	Time to Complete	Quality of Service (Low, Medium or High)	Time to Complete
	Current	New	Current	New
Receive a request for product development.	N/A	N/A	N/A	N/A
Gather information, including business objectives.	On-going	Define up front by a target date	L	H
Receive project authorization for resources.	2 weeks	1 week	H	H
Validate customer requirements.	4 weeks	1 week	L	H
Define product specifications.	3 weeks	2 weeks	M	M
Review and approve product specification.	2 Weeks	0.5 week	M	H
Form product development team.	1 week	0.5	M	M
Develop a realistic and thorough project plan.	4 weeks	2 weeks	L	H
Approve a project plan.	1 week	Included in step 7	M	N/A
List project needs.	2 weeks	1 week	L	H
Assign responsibilities, milestones and accountability.	1 week	Included in step 7	L	N/A
Establish product review process.	1 week	Included in step	L	N/A

TABLE 1: An example of an engineering process analysis checklist.

One challenge found in the non-manufacturing process is the ability to identify clear deliverables (unit), to identify beginning and ending points and to measure process performance. To establish controls and accountability for each process, define the expected outcome of the process. The expected outcome could come in the form of a report, document, design, brochure or a happy customer (internal or external). Also define the quality of the expected outcome. Many often understand what is necessary to meet the expectations of a customer, but not how well such expectations should be met.

Another challenge often encountered is identifying various opportunities for errors—usually found in information, material or components—at each step of the process. Focus on practical opportunities for error, not *every possible* opportunity that exists. The ultimate goal of Six Sigma is to reduce the opportunities for error to improve the process.

For example, in the invoicing process, opportunities for error may include: product shipment information; billing information; pricing; payment terms; and line items. Before finalizing the opportunities for error count, evaluate practicality by asking

questions such as: Does an unacceptable error rate exist for these opportunities? Focus on opportunities for error that offer potential for process improvement, not those that only make the numbers look better.

The implementation of Six Sigma methodology in service or manufacturing operations often requires similar strategies. Those who lead the effort must be aware of applicability of Six Sigma tools, metrics and training—each must be modified to accommodate any service environment.