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Six Sigma Champion Certification

What Is the Objective of This Chapter?

This chapter has two objectives. The first objective is to review the different levels of Six Sigma certification. The second objective is to provide you with sample Six Sigma Champion certification questions and answers. These questions and answers can be used as is, or modified to meet the particular needs of an organization's training and development programs.

Chapter 18, "Six Sigma Green Belt Certification," contains questions and answers for Green Belt certification. To obtain a Green Belt certification, a DMAIC project must be completed and approved by a Master Black Belt.

Description of Certification Examination

At this point, you are probably interested in obtaining certification as a Six Sigma Champion or Six Sigma Green Belt. This chapter provides information on one course of action that you can follow to attain certification as a Six Sigma Champion. Six Sigma Green Belt certification is discussed in Chapter 18.

Six Sigma certification can be obtained through a few certificate programs given by universities and many other organizations. Four types of Six Sigma certifications are offered:

- Champion
- Green Belt
- Black Belt
- Master Black Belt

Sample Champion Certification Examination Questions with Answers

Question: What is a process?

Answer: A process is a collection of interacting components that transform inputs (elements that the process needs to execute) into outputs (the results of the process) toward a common aim, called a mission.

Question: Where do processes exist?

Answer: Processes exist in all facets of organizations, as well as everyday life; for example, administration, sales, service, human resources, training, maintenance, paper flows, interdepartmental communication, and vendor relations are all processes you see at work. Importantly, relationships between people are also processes.

Question: What is variation in a process?

Answer: All processes exhibit variation in their output; these outputs can be measured. The distribution of these measurements varies, and the differences between these measurements are what we call process variation.

Question: What are the two types of variation?

Answer: Common variation is variation due to the design, management, policies, and procedures of the system itself; this type of variation is the responsibility of management. An employee cannot change the system she works in; only management can do that.

Special variation is external to the system; it disrupts the system from its routine generation of common variation. Special variation is the responsibility of front-line employees; however, front-line employees may need management's help sometimes to deal with a special cause of variation.

Question: Who owns the process? Who is responsible for the improvement of the process?

Answer: Process owners can be identified because they can change the flowchart of a process using only their signature.

Question: What are the boundaries of the process?

Answer: Boundaries make it easier to establish process ownership and highlight the process's key interfaces with other (customer/vendor) processes. Process interfaces frequently are the source of process problems, which result from a failure to understand downstream requirements; they can cause turf wars.

Question: Give some examples of process objectives and their metrics.

Answer:

Objective: Decrease the number of days from purchase request to item/service delivery.

Metric: Number of days from purchase request to item/service delivery by delivery overall, and by type of item purchased, by purchase.

Objective: Increase ease of filling out purchasing forms.

Metric: Number of questions received about how to fill out forms by month.

Objective: Increase employee satisfaction with purchased material.

Metric: Number of employee complaints about purchased material by month.

Objective: Continuously train and develop Purchasing personnel with respect to job requirements.

Metric: Number of errors per purchase order by purchase order.

Metric: Number of minutes to complete a purchase order by purchase order.

Question: How do we analyze flowcharts?

Answer: Process improvers can use a flowchart to change a process by paying attention to the following five points:

1. Process improvers find the steps of the process that are weak (for example, parts of the process that generate a high defect rate).
2. Process improvers improve the steps of the process that are within the process owner's control; that is, the steps of the process that can be changed without higher approval from the process owner.
3. Process improvers isolate the elements in the process that affect customers.
4. Process improvers find solutions that don't require additional resources.
5. Process improvers don't have to deal with political issues.

Question: Describe the three types of feedback loops.

Answer:

- **No feedback loop—**A process without a feedback loop will deteriorate and decay due to entropy.
- **Special cause only feedback loop—**A process in which all feedback is treated as special will exhibit a doubling or explosion in the variation of its output.
- **Special and common cause feedback loop—**A process in which feedback is statistically recognized as common or special will experience improvement of its output.

Question: Explain the Taguchi Loss Function. Draw a picture of it and be sure to explain what the picture implies.

Answer: Dr. Genichi Taguchi developed the continuous improvement view of quality when he invented the Taguchi Loss Function. The Taguchi Loss Function explains that losses begin to accrue as soon as a product or service deviates from nominal. Under his loss function the never-ending reduction of process variation around nominal without capital investment makes sense.

Losses incurred from unit-to-unit variation before process improvement (refer distribution A in Figure 2.7) are greater than the losses incurred from unit-to-unit variation after process improvement (refer to distribution B in Figure 2.7). As you can see, the Taguchi Loss Function promotes the continual reduction of variation of the output of a process around the nominal value, absent capital investment.

Question: Explain the origin of the 3.4 DPMO in Six Sigma management.

Answer: If a process generates output that is stable, normally distributed, and centered on the nominal value, which occupies only one half the distance allowed by specifications (see center normal distribution in Figure 17.1), then the process will produce only two defective parts per billion opportunities, one defect on each side of the specification limits. If the process mean is allowed to vary 1.5 standard deviations in either direction for the above process (see right and left normal distributions in Figure 17.1), then the process will produce 3.4 defects per million opportunities at the closest specification limit.

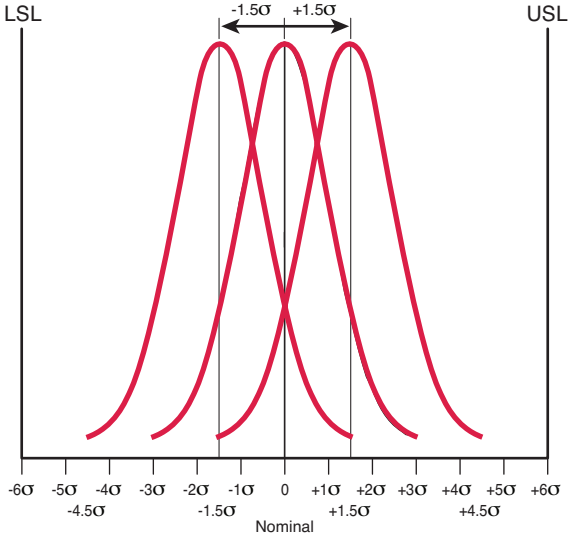

Figure 17.1 Technical definition of Six Sigma

Question: Construct a dashboard explaining the relationship between the mission statement and Six Sigma projects. Make sure you include objectives and indicators in your answer.

Answer:

Mission: To be A, B, and C						
President		Vice Presidents (V.P.)		Direct Reports (DR)		
Objectives	Indicators	VP Objectives	VP Indicators	DR Objective	DR Indicators	DMAIC DMADV Projects
A	A1	A11	A111			
	A2	A21	A211			
			A212			
		A22	A221			
B	B1					
C	C1					

Question: What are the steps of the Define phase of the DMAIC model?

Answer:

- Activate the Six Sigma team.
- Create the project charter.
- Perform SIPOC analysis.
- Perform Voice of the Customer analysis.
- Define the CTQ(s).
- Create final project objective.
- Perform tollgate review: Go-no go decision point.

Question: What are the steps of the Measure phase of the DMAIC model?

Answer:

- Create operational definitions of CTQs.
- Form data collection plan for CTQ(s).
- Perform measurement analysis.
- Collect and analyze baseline data.
- Estimate process capability for CTQ(s).
- Perform tollgate review: Go-no go decision point.

Question: What are the steps of the Analyze phase of the DMAIC model?

Answer:

- Create detailed flowchart of current state process.
- Identify potential Xs for CTQ(s).
- Perform Failure Modes and Effects Analysis (FMEA) to reduce the number of Xs.
- Develop operational definitions of Xs.
- Form data collection plan for Xs.
- Validate the measurement system for Xs.
- Collect data on the Xs.
- Test of theories to determine critical Xs.
- Develop hypotheses/takeaways about the relationships between the critical Xs and CTQ(s).
- Perform tollgate review: Go-no go decision point.

Question: What are the steps of the Improve phase of the DMAIC model?

Answer:

- Generate alternative methods for performing each step in the process represented by one or more critical Xs to improve the stability, shape, variation, and mean for all the CTQs.
- Select solutions.
- Create a flowchart for the future state process.
- Identify and mitigate risk elements for new process using FMEA.
- Run a pilot test of the new process.
- Collect and analyze the pilot test data.
- Make a go-no go decision

Question: What are the steps of the Control phase of the DMAIC model?

Answer:

- Reduce the effects of collateral damage to related processes.
- Standardize improvements (International Standards Organization [ISO]).
- Develop a control plan for the Process Owner.
- Identify and document the benefits and costs of the project.

- Input the project into the Six Sigma database.
- Diffuse the improvements throughout the organization.
- Champion, Process Owner, and Black Belt review the project.

Takeaways from This Chapter

The purpose of this chapter is to present an example of a Six Sigma examination for the Champion level of certification. Of course, individual providers of certification may modify the list of questions. The authors believe that if a student can answer the certification questions presented in this chapter, she understands the material necessary for a Six Sigma Champion certificate.