CERTIFIED
SIX SIGMA GREEN BELT

SIGMA PLUS INDUSTRIAL SOLUTIONS

Sigma+
Industrial Solutions

Six Sigma Green Belt Program

The Six Sigma Green Belt (CSSGB) works in beneath the supervision of a Six Sigma Black Belt, analyzes and fathoms quality issues, and is included in quality enhancement ventures.

A Green Belt has at slightest three working years' experience and has the knowledge and capability to demonstrate his or her skills in solving quality problems through the DMAIC concepts.

Examination

Each certification candidate is required to pass the online examination that consists of multiple-choice questions that measure comprehension of the body of knowledge.

Required Experience

Six Sigma Green Belts are employees who spend a few of their time on process improvement.

They analyze and fathom quality problems, and are involved with Six Sigma, lean, or other quality advancement projects.

Certified Six Sigma Green Belt (CSSGB)

In this body of Knowledge (BOK) include additional detail about the certificate six sigma green belt program and the cognitive level at which test questions are going to be written.

This information will provide guidance for the candidate preparing to require the exam.

The BOK t is meant to clarify the sort of content to be included within the exam. The descriptor in parentheses at the top of every entry refers to the utmost cognitive level at which the subject is going to be tested.

Main Heading

I. Define Phase

A. Overview of Six Sigma and Organization Goals

- The value of Six Sigma and the needs of implementation.
- The philosophy of Six Sigma for improving the business performance in terms of operational and financial key performance indicators.

- The evolution of Six Sigma.
- Six sigma projects and organization goals. The effect of six sigma on levelling the designed processes.
- Major Operational and Financials metrics used in the companies. (Understand)

B. Lean Principles

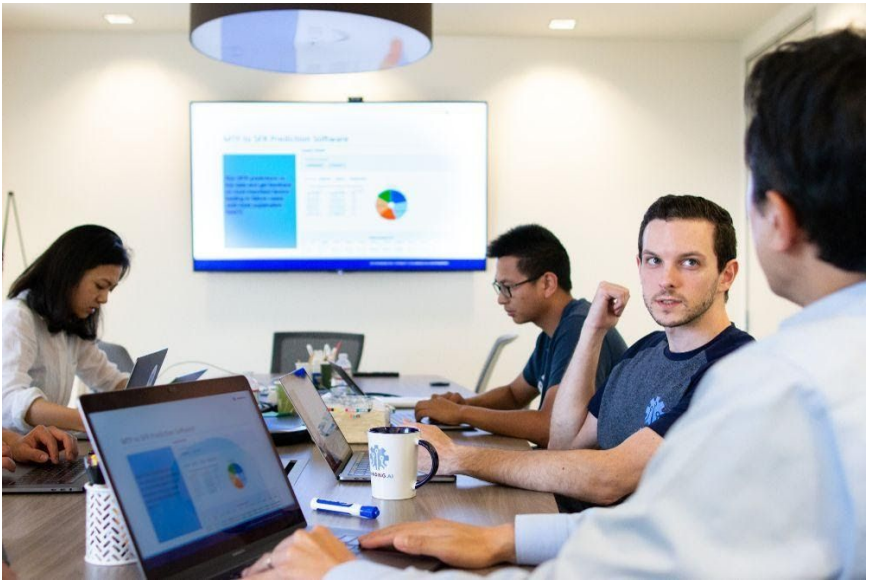
- Define the lean concepts such as: Continuous flow, KAN BAN, 5S, KAIZEN, TIMWOOD, TOC. (Apply)

C. Process mapping

- Define the process and use the Value Stream Mapping to identify the value added processes and the sources of wastes. (Understand)
- Define and describe process components and boundaries. Recognize how processes cross various functional areas and the challenges that result for process improvement efforts.
- Identify process input and output variables and evaluate their relationships using the supplier, input, process, output, customer (SIPOC) model. (Analyze)
- Identify the process owners and other stakeholders in a project. (Apply)

D. DMAIC & DMADV

- Define the DMAIC (Define, Measure, Analyze, Improve, Control) and its implementation.
- Define the DMADV (Define, Measure, Analyze, Design, Verify) and its implementation.



E. Basic Failure and Effect Analysis FMEA

- Use FMEA to evaluate a process or product and determine what might cause it to fail and the effects that failure could have. Identify and use scale criteria, calculate the risk priority number (RPN), and analyze the results. (Analyze)

F. Voice of Customer VOC

- Define the voice of the customer and describe how customer needs are translated into quantifiable, critical-to-quality (CTQ) characteristics. (Understand)

- Identify the internal and external customers of a project, and what effect the project will have on them. (Apply)
- Use quality function deployment (QFD) to translate customer requirements statements into product features, performance measures, or opportunities for

improvement. (Apply

G. Project Identification

- Describe the process of project selection based and the factors of selection. (Analyze)
- Create the project charter and define its major parameters such as, the work team, the business need, the problem statement, the expected soft and hard gains. (Understand)

II. Measure Phase

A. Process Analysis

- Develop process maps and review written procedures, work instructions, and flowcharts to identify any gaps or areas of the process that are

misaligned. (Create)

B. Probability and Statistics

- Basic Probability concepts such as the independent and mutually exclusive events, multiplication rules, permutations, and combinations. (Apply)
- Central limit theorem and its applications. (Understand)

C. Data Collection

- Types of Data. (Analyze)
- Data Sampling methods. Explain the different sampling methods and how it might impact the statistical results (Apply)
- Create the data collection plan, the source of data, the frequency of measurement, the responsible person of collecting the data, the type of statistical test to very the data quality. (Understand)

D. Measurement System Analysis MSA

- Calculate, analyze, and interpret measurement system capability using gauge repeatability and reproducibility (GR&R) studies. (Evaluate)

E. Process and Performance Capability

- The Voice of Process VOP and its specification limits (Evaluate)
- Define, describe, and conduct process capability studies, including identifying characteristics, specifications, and tolerances, and verifying stability and normality. (Evaluate)

- Process Capability (Cp, Cpk) and Process Performance (Pp, Ppk) with description of relationships between those indices. (Evaluate)
- Calculate the Sigma level from the process capability. (Evaluate)

III. Analyze Phase

A. Exploratory Data Analysis

- Multi-vari studies, select appropriate sampling plans to create multi-vari study charts and interpret the results for positional. (Create)
- Correlation and linear regression Describe the difference between correlation and causation. Calculate the correlation coefficient and linear regression and interpret the results in terms of statistical significance (p-value).(Evaluate)

B. Hypothesis Testing

- Distinguish between statistical and practical significance. (Apply)
- Determine appropriate sample sizes and develop tests for significance level, power, and type I and type II errors. (Apply)

- Conduct hypothesis tests to compare means, variances, and proportions (paired-comparison t-test, F-test, analysis of variance [ANOVA], chi square) and interpret the results. (Analyze)

V. Improve

A. Design Of Experiments DOE

- Define and describe terms such as independent and dependent variables, factors and levels, responses, treatments, errors, repetition, blocks, randomization, effects, and replication. (Understand)

- Interpret main effects analysis and interaction plots.

B. <u>Root Causes Analysis RCA</u>

- Use cause and effect diagrams and other problem-solving tools to identify the true cause of a problem. (Analyze)

C. <u>Lean tools</u>

- Waste elimination, Select and apply tools and techniques for eliminating or preventing waste, including pull systems, kanban, 5S, standard work, and poka-yoke. (Apply)

- Cycle-time reduction use various techniques to reduce cycle time (continuous flow, setup reduction). (Analyze)
- Kaizen and kaizen blitz, Define and distinguish between these two methods and apply them in various situations. (Apply)

VI. Control

A. Statistical Process Control SPC

- Describe the theory and objectives of SPC, including measuring and monitoring process performance for both continuous and discrete data. (Analyze)
- Define and distinguish between common and special cause variation and how these conditions can be deduced from control chart analysis. (Analyze)

B. Control Charts

- Identify, select, construct, and use control charts: X-R, X-s, individual and moving range (ImR or XmR), median, p, np, c, and u. (Apply)

C. Control Plan

- Assist in developing and implementing a control plan to document and monitor the process and maintain the improvements. (Apply)

C. Lean tools and process controls

- Total productive maintenance (TPM) Define the elements of TPM and describe how it can be used to control the improved process. (Understand)
- Visual factory Define the elements of a visual factory and describe how it can be used to control the improved process. (Understand)

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