

# Six Sigma Project Report Template

Pat Hammett, PhD

The University of Michigan

Comments

* The following template provides guidelines for preparing a Six Sigma written certification project report. Your report should be similar in organization and contain similar headings. Subheadings and length of each section will vary based on your findings and writing style. For a complete sample report using the template, see “Sample Project Report”.
* The information in your report should follow the DMAIC Six-Sigma Problem Solving Methodology. This includes a description of the project, key points in the problem-solving process, and detailed support for your conclusions and any recommendations. Reports should be approximately 7-15 single-spaced pages (excluding appendices), including tables and figures. Black Belt reports should be more comprehensive and thus may be longer.
* Please use the headings in this report template in your written report. In addition, some general guidelines for grammar and format are provided for reference.
* We recognize some information contained in this template is repetitive across sections. However, since different audiences will read your report to various degrees of depth, we believe it is essential to repeat certain information. Ultimately, we want you to produce a high quality, professionally-presented report that has sufficient detail to help other Six Sigma practitioners utilize and build upon your project findings.

Title of Report

Submitted to:

Name, Title

Department/Organization

Address (optional)

Prepared by:

Name, Title

Department/Organization

Address (optional)

Date Submitted

Note: Do not put a page number on title page. Begin numbering with the Executive Summary.

**Executive Summary**

The Executive Summary presents the major information contained in the report. Its readers are typically managers who need a broad understanding of the project and how it fits as a coherent whole. These readers do not need a detailed understanding of the various steps taken to complete your project. The intent of the Executive Summary is to allow readers to learn the essence of the report without reading the entire document. Subsequently they will determine whether the report is relevant to their needs, or gain an overview before focusing on the details. **We consider writing a concise (typically one-page) and comprehensive Executive Summary a critical element of a Six Sigma project report.** The Executive Summary should NOT include terms, abbreviations, or symbols unfamiliar to the reader. Readers should understand the content of the Executive Summary without reading the rest of the report.

The Executive Summary should include a problem statement, summary of approach used, and major project findings and recommendations.

* Problem Statement/Description
* Concisely describe the problem (few sentences)
* Identify the time period of the problem
* Quantify the degree of the problem and its impact on the business (if possible)

*Example:* During the past year, the average # of incoming calls with complaints per card-year has increased by 20%. These additional calls have resulted in additional staffing and facility costs of ~$100K per year. This project identifies several reasons for this increase in calls and provides solutions to reduce them.

* Summary of Problem-Solving Approach (methods used to solve problem)

*Example:* We formed a cross-functional problem solving team comprised of several departments. This team used the Six Sigma DMAIC problem solving process to identify opportunities for improvement. First, we conducted a qualitative process analysis to identify potential causes for the number of complaint calls. Next, we set up a data collection plan at two call centers. Here, we conducted an observational study over a two-month period of various key input variables versus the number of complaint calls to determine the major causes of our increase in calls. From this study, we were able to identify several recommendations for our call centers.

* Major project results or findings and recommendations – KEY information

*Example:* A major finding in our project is the majority of increased complaint calls (about 70%) are the result of either confusion with using our new ATM screen menus or delays in providing customers new ATM cards that are lost or stolen. Our analysis resulted in several recommendations to our ATM format menus. In addition, this project has led to the implementation of a new internal procedure for sending customers replacement ATM cards when they are lost or stolen. In an initial verification study of these new procedures, we have significantly reduced complaint calls resulting in a projected savings of $50,000 in reduced call center staff resources.

**1.0 Improvement Opportunity: Define Phase**

Discuss the problem you addressed. Explain how you identified your specific Six Sigma project. Where possible, integrate visuals and data summaries using tools such as a Pareto chart or information from an internal company report of current performance. Some topics that should be included in this section are:

**1.1 Problem Statement/Discussion of the process being examined**

* Include your problem statement. This section will likely repeat information from Executive Summary.
* Include a written description of the process and any potential performance issues. This is a good place to include a process map, flow chart, or a SIPOC diagram.

**1.2 Identification of key measures used to evaluate the success of your project**

* Examples: PPM Defective, DPMO, costs, quality yield, error rates, processing or order-filling time or % conformance, machine cycle time, # complaints, etc.

**1.3 Discussion of project scope**

* Include discussion of scope, particularly if you chose to limit your project from a larger problem statement, or due to time constraints/span of influence concerns.

**2.0 Current State of the Process: Measure Phase**

**2.1 Current Performance Level**
Summarize current performance. Note: You should describe the data set used to summarize performance by discussing how the data was collected, the sample size, the period of data collection, and if there were any measurement system concerns. Integrate visuals such as tables and figures to summarize performance.

Some metrics and analysis tools that could be used here:

* **Current State of Key Y Outputs** (i.e., Project Metrics)

Summarize performance using one or more of the following:

1. Quality yields (% conformance or % defective)
2. Process capability summary (either as PPM/DPMO measure, or using a process capability indices)
3. Descriptive statistics summary tables, (If the project examines a Y variable that involves continuous data (e.g., length, time, etc.), you may want to discuss whether your problem appears related to a mean off target and/or a variation issue relative to your specifications.)
4. Do not present long, bulky data set tables in the main report, place them in an appendix.
* **Distribution/Data Patterns of Key Y Outputs** - Identify distribution of metric and/or discuss any data patterns based on the current state data
1. Some possible tools to use:
2. Histogram, Box Plot, Pareto Chart
3. Statistical Process Control charts and/or Run (Trend) charts
4. If possible, identify if problem is a chronic and/or a sporadic problem
* **Measurement System Analysis (Optional)**

Discuss the validity of your measurement data either qualitatively (in words) or quantitatively using tools such as a Gage Repeatability and Reproducibility Study, Repeated Measurement Study, Accuracy Study, etc. If appropriate, discuss the strengths and limitations of your data collection approach.

**2.2 Identification of Key Variables**

* Identify Key Product/Process Output Variables (KPOV’s) examined and/or list potential Key Product Input Variables (KPIV’s).
* Sample Tools that might be used here include P-Diagram or a Cause-Effect Diagram. Or, simply include a summary paragraph with a list of potential variables.

**2.3 Identification of Target Performance Levels or Project Goals**

* Target Performance Levels (Required) - Identify the desired performance levels or improvement amounts of your performance metric

Examples of Current and Target Performance Level Assessments:

* Our current process requires 15 days to complete a special order and we wish to reduce this time to less than 7 days. Or,
* We currently are operating at 20,000 PPM Defective and we wish to reduce this level to less than 1000 PPM Defective.
* We want to reduce our reject rate from 10% to less than 1%.

**3.0 Analysis and Findings: The Analyze Phase**

Analyze gaps between current performance and target performance levels, explaining possible sources of variation. Include subtopics and subheadings that reflect your case. Include visuals and supporting analyses from various methods discussed in the course including cause-and-effect diagrams, stratification analysis, scatter plot analysis, correlation analysis, etc.

In this section, you should discuss the relationships between your KPIVs and KPOVs (X’s and Y’s). For example, you should discuss variables that have a direct cause-and-effect relationship or those input variable settings (or range of settings) in which your outputs are robust.

For most reports, your analysis will include both a qualitative and quantitative assessment. For a qualitative assessment, you might include a cause-and-effect diagram summarizing potential issues, a process map, or simply a discussion of the results from brainstorming sessions and interviews with affected employees. For your quantitative analysis, you should provide some data analysis that demonstrates a more systematic and comprehensive assessment of your key output variable and/or the main causes for lack of performance. Please recognize the purpose of the project is to solve a problem and not necessarily to use a specific quality analysis tool or method. Thus, try to use the tool/method appropriate to solving the problem even if the tool used is fairly simple.

In many cases, reports should also include analyses and results for insignificant or unimportant variables. Here, identifying variables or (variable settings) that do not affect your key Y variables provide additional opportunities for cost savings. For example, a project may discover that one may allow a wider tolerance for a certain feature or process step and still meet next-process customer requirements. Here, widening the tolerance may yield an additional cost saving.

**Information that must be included in this section:**

* You must demonstrate your understanding of course concepts and tools by showing evidence of the use of at least one data analysis tool/method discussed in this course (at least three for Black Belt reports). You should support this requirement by including at least one table, graph, or diagram within the main body of the text. (e.g., You might include a Pareto chart, Stratification analysis table, Cause-and-effect diagram, Scatter plot, Correlation analysis, Process control chars, Experimental results, Value stream map analysis, Value-add analysis, Measurement systems analysis if your report involves improving a measurement system.) Tables and figures must be integrated into the main body of your report; additional analysis/material may be included in an appendix.
* We encourage the use of additional data analysis tools and may request re-submittal of a project to include additional analysis if appropriate.

Note: The tools used in the Analyze Phase may also apply to other phases such as Improve or Measure Phase. Feel free to include where appropriate to make an effective argument.

**4.0 Recommendations: The Improve Phase**

Specify your criteria for choosing a recommendation. Identify alternative ways to improve performance. Try to evaluate how well alternatives will be able to meet target performance goals. Present conclusions regarding alternatives and identify a recommended solution. Consider presenting the material in the following subtopics with appropriate second-level headings.

**Alternative Solutions Considered**

**Recommended Solution**

Historically, improvement recommendations fall into a few general categories.

These include (but are not limited to):

* Provide new training for operators to more effectively perform tasks (e.g., To address customer concerns, or adopt best work practices)
* Standardize procedures or processes
* Make adjustments to settings of key process input variables
* Redesign process flow (e.g., Reorganize the flow of parts/documents/information through your system)
* Install new process monitoring or automatic defect detection system (e.g., Install monitoring systems for either X’s or Y’s)

**5.0 Monitoring and Control: The Control Phase**

Identify the method of control to prevent reoccurrence of problems. Control phase recommendations might include:

* Training and Standard Operating Procedures
* Design Control/Change Management Control Procedures
* Supplier Control/Process Setup Control Processes
* Source Inspection (in-process controls such as poke-yoke devices)
* End of Process Quality Inspection and Process Monitoring/Tracking Systems
1. Quality Audits
2. Statistical Process Control with control charts
3. 100% Inspection (usually not recommended as long term strategy)

Comment: We realize it might not be possible to include data that supports an actual improvement was made to your process because of project time constraints. If this is the case, please discuss the potential benefits of implementing your recommendations.

**6.0 Summary/Conclusion**

Briefly restate the problem, the process followed to reach a solution, and the chosen solution. List the potential benefits of the chosen solution. If your results or recommendations are incomplete or sensitive to your company, please try to discuss potential benefits in relative terms. (e.g., 20% reduction in error rates or a 10% cost savings). If appropriate, explain any further action to be taken, including the responsible team members and schedule.

In this section, you may wish to identify opportunities to apply your recommendations to other similar processes. You may also wish to discuss lessons learned to help others.

**Appendices**

Use appendices to present information that is too bulky to be presented in the body of the report or only interest a few readers. For example, large diagrams or charts, computations, software package graphics, test data, and texts of supporting documents should appear in appendices.

Appendices have the following characteristics:

* Titled "Appendix," not "Figure" or "Table"
* Usually lettered rather than numbered
* Referred to at appropriate points in the body of the report so they are accessible to the readers who wish to reference them

Only use an appendix when the data is not relevant to the report but might be of interest to some readers. We expect most if not all tables and graphs to be in the main body of the report.

**General Guidelines for Writing Reports**

The following list presents reminders to help you write reports that are easy to read and understand. You do not have to follow every one of these recommendations. How you present your written argument depends on your situation. These tips are offered as basic guidelines. For more information about techniques for writing clearly, consult a writing handbook or a writing website such as: http://www.plainlanguage.gov/

* Know your audience and purpose when writing.
* Choose and organize your content around your purpose and audience.
* Use frequent, informative headings and subheadings. Headings and subheadings help readers preview and review the major sections of information.
* Divide material into short sections.
* Introduce the sequence of sections that follow to let readers know what's coming in the report.
* Limit each paragraph to one topic.
* Vary structure and length of sentences. However, prefer short, direct sentences.
* Use "you" to speak to the reader. Use "I" or "we" to refer to events in which you were involved. Note: Using "I" or "we" is now widely accepted in technical writing.
* Be concise. Avoid unnecessary words.
* Select appropriate diction. Prefer clear, simple language. Avoid inflated, obscuring words.
* Prefer active voice. Use the passive voice only when the identity of the agent is irrelevant.
* Be consistent in tenses. Prefer present tense.
* Prefer active verbs to abstract nouns.
* Use terms consistently to refer to the same object.
* Use lists.
* Use parallel grammatical structure for ideas or facts of equivalent importance (often presented in lists). For example, Instead of Accidents can be either personal injury producing or cause property damage Write Accidents can either produce personal injuries or cause property damage Or Accidents can either injure people or damage property.
* Use visual cues to guide readers such as:
1. Bullets or numbers to signal items in a list
2. Indented lists
3. Boldface to emphasize key points
* Use good document design: Use plenty of white space; avoid all uppercase letters and underlining; use serif typefaces (such as Times New Roman used here); and use left justified, ragged right margins.
* Display material suited to visual presentation in well-designed, clear visuals such as; tables, charts, and diagrams.