

Semester Project Steps

Step 1: Define the project.

1. Define the problem in terms of a gap between what is and what should be. (For example, "Customers report an excessive number of errors. The team's objective is to reduce the number of errors by 25% in 4 weeks.")
2. Document why it is important to be working on this particular problem:
 - Explain how you know it is a problem, providing any data you might have that support this.
 - List the customer's key quality characteristics. State how closing the gap will benefit the customer in terms of at least one of these characteristics.
3. Determine what data you will use to measure progress:
 - Decide what data you will use to provide a baseline against which improvement can be measured.
 - Develop any operational definitions you will need to collect the data.

Step 2: Study the current situation.

1. Collect baseline data and plot them. (Sometimes historical data can be used for this purpose.) A run chart or control chart is usually used to exhibit baseline data.
2. Develop flowcharts of the process(es).
3. Provide any helpful sketches or visual aids.
4. Identify any variables that might have a bearing on the problem. Consider the variables of what, where, to what extent, and who. Data will be gathered on these variables to localize the problem.
5. Design data collection instruments.
6. Collect the data and summarize what you have learned about the variable's effects on the problem. [Use histograms, Paretos, run charts, box-and-whiskers, etc.]
7. Determine what additional information would be helpful at this time. Repeat substeps 2 through 7 until there is no additional information that would be helpful at this time.

Step 3: Analyze the potential causes.

1. Determine potential causes of the current conditions:
 - Use the data collected in step 2 and the experience of the people who work in the process to identify conditions that might lead to the problem.
 - Construct cause-and-effect diagrams for these conditions of interest.
 - Decide on most likely causes by checking against the data from step 2 and the experience of the people working in the process.
2. Determine whether more data are needed. If so, **repeat substeps 2-7 of step 2**
3. If possible, verify the causes through observation or by directly controlling variables. (Design of experiments.)

Step 4: Implement a solution.

1. Develop a list of solutions to be considered.
2. Decide which solutions should be tried:
 - Carefully assess the feasibility of each solution, the likelihood of success, and potential adverse consequences.
 - Clearly indicate why you are choosing a particular solution.
3. Determine how the preferred solution will be implemented. Will there be a pilot project? Who will be responsible for the implementation? Who will train those involved? [GANTT chart, PERT diagram, 3W's (who-what-when)]
4. Implement the preferred solution.
