**Seven Quality Control Tools**

**In Project Management**

**For**

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Quality Control can be improved by using seven tools. International Journal for Scientific Research says that these are: 1) Flow chart, 2) Cause and Effect Diagram, 3) Check sheet, 4) Pareto diagram, 5) Histogram, 6) Scatter plot, and 7) Control charts.

**Flow chart:** A diagram of inputs, processes, and outputs within a system. (POMBOK)

A flow chart is a useful tool in quality improvement because it is used to communicate, to anyone, what happens at each stage, using symbols and just a few words. It shows how a project process is supposed to work step by step, this could save time and improve a project’s tasks.

A flow chart should begin with an elongated circle for the start of the chart. Rectangles then are used to show directions or actions that need to be taken. Diamonds are used in a flow chart to symbolize that a decision is required at this point. Parallelograms are used, in flow charts, to show an input or an output. (MindTools)

**Cause and Effect Diagram:** A decomposition technique which helps to trace an undesirable effect back to its original source. (POMBOK)

A cause and effect diagram can help determine the root cause of a problem, find bottlenecks in a process, and point out where and why a process is not functioning properly. It was first developed as a tool for quality control.

The first step to using this diagram tool is to identify the problem, draw a line and label the issue. Second, is to identify the major factors that are involved and draw an angled line for each factor. Third, identify the possible causes or each factor and attach lines to those factors. Forth, study this diagram to find the root cause of the problem in the process. (MindTools)

**Check sheet:** A tally sheet which can be used as a checklist when gathering data. (POMBOK)

Check sheets are a tool that has a list of items and some indicator of how often that item occurs. Checklists are tools that can make data easier to process because the information is provided on how often a certain item occurs.

Check sheets are helpful in drawing attention to something that occurs often. They can also help to remind personnel that something needs to be done. They also work better with another tool called a histogram. (MindTools)

**Histogram:** A bar chart used specifically to describe a central tendency, dispersion, and shape of a mathematical distribution.

A histogram is very useful when it is numerical data that is being studied. It must have at least 50 consecutive data points from a single process. With this data, a graphical representation can be generated from the data. It is basically a quantitative measurement of the data that was input into the graph.

This tool is used to measure the information, it is sometimes used to compare to other similar projects as a comparison to how well the project is progressing. It is also useful for comparing data by rows of data and their individual values. It is commonly used for quality improvement, like comparing how many defects occurred on separate projects.

**Pareto Diagrams:** A type of histogram, which is organized by frequency of occurrence and shows how many results were generated by each kind of cause. (POMBOK)

This tool translates very well to quality problems. It is known to have been formulated to present the idea of 80% of the wealth is owned by 20% of the population theory. It has sense been used to develop a hierarchical order to problems within processes, which can show that 80% of problems are caused by 20% of potential sources.

This diagram is used to identify nonconformity items and summarize all kinds of data. It is most often used in presentations to management to inform them of certain data. (MD+DIadmin)

**Scatter plot diagram:** A chart which uses a regression line to explain or predict how a change in an independent variable will change a dependent variable. (POMBOK)

A scatter diagram shows a relationship between two variables; it does not show that causes the other, but that they are related to each other. Once values are placed on a X/Y graphical chart, the relationship can then be seen and a line drawn between the center of the values, also giving a reference for above the mean average or below as well.

It is generally a quantitative measuring tool, and can be used as a tool for projects and improving control of certain tasks. This then gives managers a visual representation of where tasks are in comparison to each other or even which tasks need more improvement.

**Control charts:** A display of data over a time-period and against predetermined control limits. This allows a centerline to be established which can assist in detecting trends of plotted value.

A control chart shows statistical upper and lower limits, of data, drawn on either side of a task or process average. This statistical information can then show whether a process is falling within the upper and lower limits.

If this chart is being used in a manufacturing process, this chart can show trends and whether certain things have gotten out of control. It can measure results over time and show an estimate of a process and if it is within upper and lower limits. Such a tool can point out problem areas and assist managers on sample groups of wire length on spools or cut rebar sections being sold, for instance, to determine if waste is occurring too often.

These seven tools are often used to improve control on quality. Often, they assist managers by giving visual information on charts and graphs, which assists them in presenting this information to management or allowing them to see trends which they can then inform those who can then make some changes on their process. This then improves quality of products by improving processes.

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