Lecture –8

Quality Control



METHODS OF QUALITY CONTROL

The purpose of quality control is to assure that processes are performing in an acceptable manner. Quality control can be done in the following ways:

A. **INSPECTION**

B. **STATISTICAL PROCESS CONTROL**

1.Acceptance sampling

i.Single sampling plan

ii.Double sampling plan

iii.Multiple sampling plan

2.Control charts

i.Control chart for variables

a. Mean chart

b. Range chart

ii.Control chart for attributes

a. "P" chart

b. "C" chart

A. INSPECTION:

Monitoring in the production process can occur at three points: before production, during production and after production.

The logic of checking conformance before production is to make sure that inputs are acceptable.

The logic of checking conformance during production is to make sure that the conversion of inputs into outputs is proceeding in an acceptable manner.

The logic of checking conformance of output is to make a final verification of conformance before passing goods on to customers.

The purpose of inspection is to provide information on the degree to which items conform to standard. The basic issues are:

- How much to inspect and how often.
- At what points in the process inspection should occur.
- Whether to inspect in a centralized or on-site location.
- Whether to inspect attributes or variables.

B. <u>STATISTICAL PROCESS CONTROL:</u>

Statistical process control is to evaluate the output of a process to determine its acceptability. Managers take periodic samples from the process and compare them with a predetermined standard. If the sample results are not acceptable, they stop the process and

take corrective actions. If the sample results are acceptable, they allow the process to continue. Statistical process control van be two types:

1.Acceptance Sampling

2.Control Charts

1. Acceptance Sampling:

Acceptance sampling is a form of inspection that is applied to lots or batches of items either before or after a process instead of during the process.

The purpose of acceptance sampling is to decide whether a lot satisfies pre-determined standards. Lots that satisfy these standards are passed or accepted, those that do not are rejected. The followings are some of the different kinds of sampling plan:

i.Single Sampling Plan:

In this plan one random sample is drawn from each lot and every item in the sample is examined and classified as either 'good' or 'defective'.

ii.Double Sampling Plan:

A double sampling plan allows for the opportunity to take a second sample if the results of the initial sample are inconclusive.

iii.Multiple Sampling Plan:

A multiple sampling plan is similar to a double sampling plan except that more than two samples may be required.

2. Control Charts:

A control chart is a time-ordered plot of sample statistics. It is used to distinguish between random variability and non-random variability. Two types of control charts are used:

i. Control Charts for Variables

ii. Control Charts for Attributes

i. Control Charts for Variables:

Variables mean product or service characteristics such as weight, length, volume or time that can be measured. Mean and range charts are used to monitor variables.

a. Mean Chart: A mean chart sometimes referred to as an 'X bar' chart is used to measure the mean.

b. Range Chart: A range chart or 'R'- chart is used to monitor the mean and the variability of the process distribution.

ii. Control Charts for Attributes:

Attributes mean product or service characteristics that can be quickly counted for acceptable quality. Two charts commonly used for quality measures based on product or service attributes are the 'P' chart and 'C' chart.

a. 'P' Chart: 'P' chart is used for controlling the proportion of defective products or service generated by the process. The quality characteristic is counted rather than measured and the entire item or service can be declared 'good' or 'defective'.

b. 'C' Chart: When the goal is to control the number of defects per unit, a 'C' chart is used.

QUALITY CERTIFICATION

Quality Certification:

Many firms that do business internationally recognize the importance of quality certification. The purpose of international organization for standardization (ISO) is to promote worldwide standards that will improve operating efficiency, improve productivity and reduce costs. The ISO is composed of the national standard bodies of more then 100 countries. Some 180 technical committees conduct the work of ISO.

ISO-9000 Series:

The ISO 9000 series is a set of international standards on quality management and quality assurance. These standards are critical to doing business internationally. They must go through a process

that involves documenting quality procedures and on-site assessments.

Series	Indications
ISO-9000 (Guidelines for use)	Helps companies determine which standards of ISO-9001, 9002, 9003 applies.
ISO-9001 (Quality system)	Outlines guidelines for companies that engage in design, development, production, installation and servicing of products or services.
ISO-9002 (Quality system)	Similar to ISO-9001 but excludes companies engaged in designing and development.
ISO-9003 (Quality system)	Covers companies engaged in final inspection and testing.
ISO-9004 (Guidelines for use)	The guidelines for applying the elements of the quality management system.

The above table shows that, ISO-9001, 9002 & 9003 are well-defined standards while ISO-9000 and 9004 only establish guidelines for operations.

ISO-14000:

The International organization for standardization (ISO) introduced new set of standards in 1996; ISO-14000 is intended to assess a company's performance in terms of environmental responsibilities. It is developed to control the impact of an organization's activities and outputs on the environment. The ISO 14000 standards can lead to benefits such as reducing the cost of waste management, conserving energy and materials, lowering distribution costs and improving corporate image.

Model Questions:

1. Describe, in details, the Methods of Quality Control.
2. What is Quality Certification? Discuss the themes of ISO-9000 series and ISO-14000.

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