

FUNDAMENTAL OF INDUSTRIAL MANAGEMENT

Unit -2 Organizational Aspects of Quality Assurance	<ul style="list-style-type: none">• Quality Assurance (QA): Introduction, Definition, Management principles in QA, QA in different stages, Quality Planning.• ISO: Introduction, ISO 9000 series of standard, Benefits of ISO.• ISO 9001, Benefits of ISO 9001.• Quality survey: Scope, Types of audit, inspection methods, Quality budget, Vendor Quality Rating
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Quality Assurance (QA):

Quality Assurance (QA) - “all planned and systemic activities necessary to provide adequate confidence that a product or service will satisfy given requirements for quality”.

- Quality assurance is oriented toward preventing defects.
- It is defined by those activities that modify the development processes to prevent the introduction of defects.
- Quality assurance is more concerned with the processes that produce the final product and making sure that quality is part of each phase.
- QA is about maturing the process towards minimum defect.
- It is about balancing methodology, leadership, and technology.
- It is about taking into account human factors as well as technological ones.

Management principles:

- 1 Customer focus
- 2 Leadership
- 3 Involvement of people
- 4 Process approach
- 5 System approach to management
- 6 Continuous improvement
- 7 Factual approach to decision making
- 8 Mutually beneficial supplier relationships



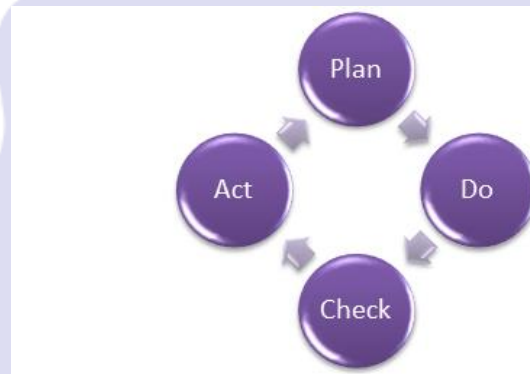
QA in different stages:

Quality assurance has a defined cycle called PDCA cycle or Deming cycle. The phases of this cycle are:

- Plan
- Do
- Check
- Act

These above steps are repeated to ensure that processes followed in the organization are evaluated and improved on a periodic basis. Let's look into the above steps in detail -

- **Plan** - Organization should plan and establish the process related objectives and determine the processes that are required to deliver a high-Quality end product.



- **Do** - Development and testing of Processes and also "do" changes in the processes
- **Check** - Monitoring of processes, modify the processes, and check whether it meets the predetermined objectives
- **Act** - Implement actions that are necessary to achieve improvements in the processes. An organization must use Quality Assurance to ensure that the product is designed and implemented with correct procedures. This helps reduce problems and errors, in the final product.

Quality Planning:

Systematic approach to understand the customer requirements and ensuring that all requirements met. By planning the quality one has to respect some principles:

- **Customer satisfaction comes first:** Quality is defined by the requirements of the customer.
- **Prevention over inspection:** It's better to avoid mistakes than to inspect the result and repair the defects.
- **Management responsibility:** Costs of quality must be approved by the management.

- **Continuous improvement:** Becoming better is an iteratively structured process

Quality Planning

- This is a planning activity. Indeed, in PMBOK (Project Management Body of Knowledge), it's classified under the Planning Process Group.
- The key outputs are Quality Management Plan, Quality Improvement Plan, Metrics, Checklists.
- To arrive at these outputs, the key activities are Determining relevant quality standards (leads to metrics and checklists), Determining how to arrive at these standards (to arrive at the management and improvement plans).

Let's take an example of building a house. Prior to the start of the actual building, key metrics for success are determined. Most of these metrics have to do with the requirements of the customer: 900 sq. ft of usable floorspace, no direct morning sunlight coming in, good air circulation, good fengshui etc. Some metrics are company standards and impact the reputation of the company e.g. quality of the workmanship.

Quality Planning would then be to come up with a plan to determine eg. how to measure these metrics or checklists, when to do so, if there's a need for external consultants (eg. fengshui master) etc.

ISO (International Standard Organization):

ISO is a International Standard Organization

- To improve the management of business or benchmark the company's performance against other businesses around the world.
- To develop and provide international standards in response to market needs.
- To provide the guidance for applying and enforcing the standard them to ensure your business satisfies internationally recognized procedures

ISO 9000:

Quality is something every company strives for and is often times very difficult to achieve. Complications concerning efficiency and quality present themselves everyday in business, whether an important document cannot be found or a consumer finds a product not up to their expectations. How can a company increase the quality of its products and services? The answer is ISO 9000.

As standards go, ISO 9000 is one of the most widely recognized in the world. ISO 9000 is a quality management standard that presents guidelines intended to increase business efficiency

and customer satisfaction. The goal of ISO 9000 is to embed a quality management system within an organization, increasing productivity, reducing unnecessary costs, and ensuring quality of processes and products.

ISO 9001 is applicable to businesses and organizations from every sector. The process oriented approach makes the standard applicable to service organizations as well. Its general guidelines allow for the flexibility needed for today's diverse business world.

Importance ISO 9000:

The importance of ISO 9000 is the importance of quality. Many companies offer products and services, but it is those companies who put out the best products and services efficiently that succeed. With ISO 9000, an organization can identify the root of the problem, and therefore find a solution. By improving efficiency, profit can be maximized.

As a broad range of companies implement the ISO 9000 standards, a supply chain with integrity is created. Each company that participates in the process of developing, manufacturing, and marketing a product knows that it is part of an internationally known, reliable system.

Not only do businesses recognize the importance of the ISO 9000, but also the customer realizes the importance of quality. And because the consumer is most important to a company, ISO 9000 makes the customer its focus.

ISO 9000 Management principles:

1. A Customer Focus

As stated before, the customer is the primary focus of a business. By understanding and responding to the needs of customers, an organization can correctly targeting key demographics and therefore increase revenue by delivering the products and services that the customer is looking for. With knowledge of customer needs, resources can be allocated appropriately and efficiently. Most importantly, a business's dedication will be recognized by the customer, creating customer loyalty. And customer loyalty is return business.

2. Good Leadership

A team of good leaders will establish unity and direction quickly in a business environment. Their goal is to motivate everyone working on the project, and successful leaders will minimize miscommunication within and between departments. Their role is intimately intertwined with the next ISO 9000 principle.

3. Involvement of people

The inclusion of everyone on a business team is critical to its success. Involvement of substance will lead to a personal investment in a project and in turn create motivated, committed workers. These people will tend towards innovation and creativity, and utilize their full abilities to complete a project. If people have a vested interest in performance, they will be eager to participate in the continual improvement that ISO 9000 facilitates.

4. Process approach to quality management

The best results are achieved when activities and resources are managed together. This process approach to quality management can lower costs through the effective use of resources, personnel, and time. If a process is controlled as a whole, management can focus on goals that are important to the big picture, and prioritize objectives to maximize effectiveness.

5. Management system approach

Combining management groups may seem like a dangerous clash of titans, but if done correctly can result in an efficient and effective management system. If leaders are dedicated to the goals of an organization, they will aid each other to achieve improved productivity. Some results include integration and alignment of key processes. Additionally, interested parties will recognize the consistency, effectiveness, and efficiency that come with a management system. Both suppliers and customers will gain confidence in a business's abilities.

6. Continual Improvement

The importance of this principle is paramount, and should be a permanent objective of every organization. Through increased performance, a company can increase profits and gain an advantage over competitors. If a whole business is dedicated to continual improvement, improvement activities will be aligned, leading to faster and more efficient development.

Ready for improvement and change, businesses will have the flexibility to react quickly to new opportunities.

7. Factual approach to decision making

Effective decisions are based on the analysis and interpretation of information and data. By making informed decisions, an organization will be more likely to make the right decision. As companies make this a habit, they will be able to demonstrate the effectiveness of past decisions. This will put confidence in current and future decisions.

8. Supplier relationships

It is important to establish a mutually beneficial supplier relationship; such a relationship creates value for both parties. A supplier that recognizes a mutually beneficial relationship will be quick to react when a business needs to respond to customer needs or market changes. Through close contact and interaction with a supplier, both organizations will be able to optimize resources and costs.

ISO 9000 and ISO 9001

In ISO 9000 documents, most people learn about vocabulary associated with improving processes. Understanding vocabulary is essential to executing plans for improvement related to ISO 9000 documents. The documents do not include numerous actionable items that could result in improvements. On the other hand, if your company wants to know what to do for improvement, employees should read the requirements featured in ISO 9001. They will tell employees what is required of them to improve their processes within the company.

Benefits of ISO 9001

ISO 9001 aims to provide a practical and workable Quality Management System for improving and monitoring all areas of your business.

Achieving the ISO 9001 standard is not about establishing a set of procedures that are complicated and difficult to manage. The aim is to provide a workable management system that is suitable for your organisation. With the right support and the knowledge of your employees, you will end up with a system that will improve all areas of your organisation.

Implementing an effective and robust ISO 9001 Quality Management System (QMS) will help you to focus on the important areas of your business and improve efficiency. The management processes that are established throughout your business will provide a sound foundation, leading to increased productivity and profit. This in turn will improve your customer acquisition and retention.

Some of the main benefits of ISO 9001 certification include:

- Suitable for both small and large organisations
- Better internal management
- Less wastage
- Increase in efficiency, productivity and profit
- Improved customer retention and acquisition
- Consistent outcomes, measured and monitored
- Globally recognised standard
- Compatible with other ISO standards

Audit:

- An audit is a “systematic, independent and documented process for obtaining audit evidence like records, statements of fact or other information which are relevant and verifiable
- To evaluate it objectively to determine the extent to which the audit criteria like set of policies, procedures or requirements are fulfilled.” are not.
- To identify the area of improvements

Audit Types:

1. Process audit:

This type of audit verifies that processes are working within established limits. It evaluates an operation or method against predetermined instructions or standards to measure conformance to these standards and the effectiveness of the instructions. A process audit may:

- ✓ Check conformance to defined requirements such as time, accuracy, temperature, pressure, composition, responsiveness, amperage, and component mixture.
- ✓ Examine the resources (equipment, materials, people) applied to transform the inputs into outputs, the environment, the methods (procedures, instructions) followed, and the measures collected to determine process performance.
- ✓ Check the adequacy and effectiveness of the process controls established by procedures, work instructions, flowcharts, and training and process specifications.

2. Product audit

This type of audit is an examination of a particular product or service, such as hardware, processed material, or software, to evaluate whether it conforms to requirements (i.e., specifications, performance standards, and customer requirements).

3. System audit

An audit conducted on a management system. It can be described as a documented activity performed to verify, by examination and evaluation of objective evidence, that applicable elements of the system are appropriate and effective and have been developed, documented, and implemented in accordance and in conjunction with specified requirements.

- ✓ A **quality management system audit** evaluates an existing quality management program to determine its conformance to company policies, contract commitments, and regulatory requirements.
- ✓ Similarly, an **environmental system audit** examines an environmental management system, a **food safety system audit** examines a food safety management system, and **safety system audits** examine the safety management system.

An audit may also be classified as internal or external, depending on the interrelationships among participants. Internal audits are performed by employees of your organization. External audits are performed by an outside agent. Internal audits are often referred to as first-party audits, while external audits can be either second-party or third-party.

First-party audit

Performed within an organization to measure its strengths and weaknesses against its own procedures or methods and/or against external standards adopted by (voluntary) or imposed on (mandatory) the organization.

An internal audit conducted by auditors who are employed by the organization being audited but who have no vested interest in the audit results of the area being audited.

Second-party audit

An external audit performed on a supplier by a customer or by a contracted organization on behalf of a customer.

A contract is in place, and the goods or services are being, or will be, delivered.

Second-party audits are subject to the rules of contract law, as they are providing contractual direction from the customer to the supplier. Second-party audits tend to be more formal than first-party audits because audit results could influence the customer's purchasing decisions.

Third-party audit

Performed by an audit organization independent of the customer-supplier relationship and is free of any conflict of interest. Independence of the audit organization is a key component of a third-party audit. Third-party audits may result in certification, registration, recognition, an award, license approval, a citation, a fine, or a penalty issued by the third-party organization or an interested party.

Inspection:

Procedure in which a part or product feature, such as a dimension, is examined to determine whether or not it conforms to specification is called inspection

Many inspections rely on measurement techniques, while others use gaging methods

Gaging determines simply whether the part characteristic meets or does not meet the design specification

Gaging is usually faster than measuring, but not much information is provided about feature of interest

Types of Inspection

-Inspection involves the use of measurement and gaging techniques to determine whether a product, its components, subassemblies, or materials conform to design specifications

-Inspections divide into two types:

1. Inspection by variables - product or part dimensions of interest are *measured* by the appropriate measuring instruments
2. Inspection by attributes – product or part dimensions are *gaged* to determine whether or not they are within tolerance limits

Manual Inspection

1. Inspection procedures are often performed manually
2. The work is boring and monotonous, yet the need for precision and accuracy is high
3. Hours may be required to measure the important dimensions of only one part
4. Because of the time and cost of manual inspection, statistical sampling procedures are often used to reduce the need to inspect every part

Sampling inspection

1. When sampling inspection is used, the number of parts in the sample is usually small compared to the quantity of parts produced

-Sample size may be 1% of production run

2. Because not all of the items in the population are measured, there is a risk in any sampling procedure that defective parts will slip through

-The risk can be reduced by taking a larger sample size

-Fact is that less than 100% good quality must be tolerated as the price of using sampling

Vendor Quality Training

Vendor rating is the result of a formal vendor evaluation system. Vendors or suppliers are given standing, status, or title according to their attainment of some level of performance, such as delivery, lead time, quality, price, or some combination of variables.

The motivation for the establishment of such a rating system is part of the effort of manufacturers and service firms to ensure that the desired characteristics of a purchased product or service is built in and not determined later by some after-the-fact indicator.

The vendor rating may take the form of a hierarchical ranking from poor to excellent and whatever rankings the firm chooses to insert in between the two.

For some firms, the vendor rating may come in the form of some sort of award system or as some variation of certification.

Much of this attention to vendor rating is a direct result of the widespread implementation of the just-in-time concept.

7 C's Principles

1. Competency— managerial, technical, administrative, and professional competence of the supplying firm.
2. Capacity—supplier's ability to meet physical, intellectual and financial requirements.
3. Commitment—supplier's willingness to commit physical, intellectual and financial resources.
4. Control—effective management control and information systems.
5. Cash resources—financial resources and stability of the supplier. Profit, ROI, ROE, asset-turnover ratio.
6. Cost—total acquisition cost, not just price.
7. Consistency—supplier's ability to exhibit quality and reliability over time