



INTEGRATED INSTITUTE OF PROFESSIONAL MANAGEMENT

Our Accreditations



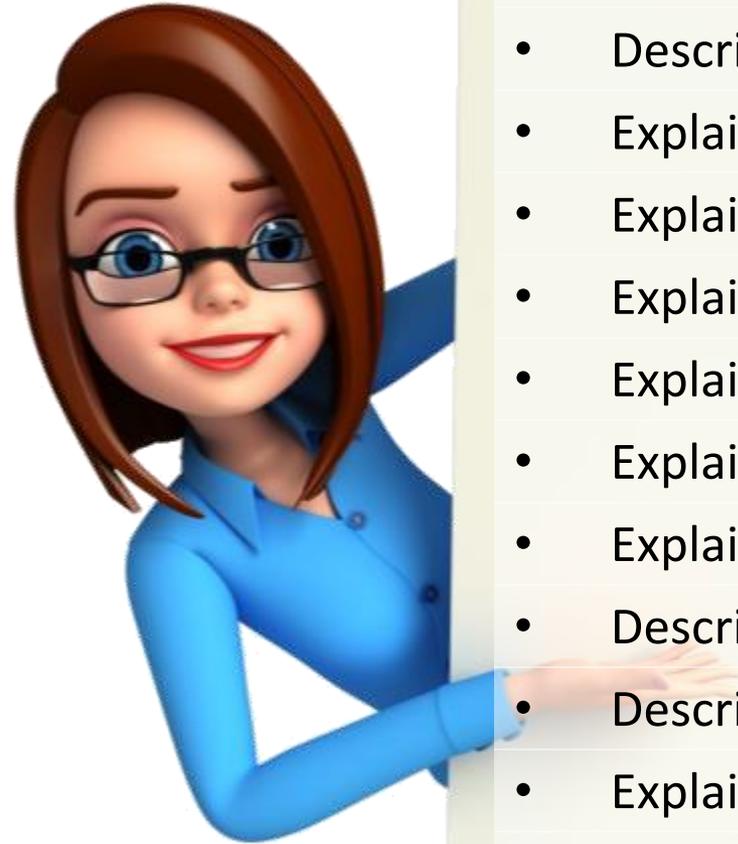
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Our Standards





Course Objectives



- Explain What is Total Quality Management (TQM)
- Describe the Evolution of TQM
- Explain Concepts in TQM
- Explain What is Cost Benefit Analysis
- Explain the Principles of TQM Pyramid
- Explain Kano's Five Types of Quality
- Explain Kinds of Measurements in TQM
- Explain the STINGER Principle
- Describe the Various Tools used in TQM
- Describe the Focus Areas of TQM
- Explain the Steps for the Quality Improvement Process
- Explain Four Absolutes of Quality Improvement Process
- Explain the Implementation of TQM
- Explain Deming's 14 Points to Improve Quality
- List the Benefits of TQM

Introduction

Look at the products given below.



So, what do you think is common among all the given products?

Introduction

Yes, they are all 'defective products'.

This means that each of the shown products has some or the other defect in it.



Introduction



As you can see, the glass sphere has an air bubble in it.



The matchstick's tip has sulphur missing on it.



The weaving of the cloth piece is not proper and uniform.



Introduction



No one would like to buy or use defective products. Hence, you can understand that it is very important that products as well as services that are delivered to customers should be free from defects to ensure customer satisfaction.

Introduction

When products and services are delivered with great 'quality', then such defect-free products and services help to build the prestige and brand of the company. Products with a good quality are of a superior grade or possess a degree or grade of excellence or worth.



Introduction

One of the methodologies used to eliminate defects and deliver high-quality products and services is Total Quality Management.



Introduction

‘Total Quality Management’ or ‘TQM’ is defined as a continuous pursuit for excellence by creating the right skills and attitudes in people. This is done to prevent possible defects and satisfy customers/users totally at all times.



Introduction

You should bear in mind that TQM is an organization-wide activity that has to reach every individual within an organization.

Let us now learn about the **'Total Quality Management'** or **'TQM'** in detail.



What is Quality?

Quality

Customer Satisfaction

Grade

Accuracy

Precision

Quality is the responsibility of each and everyone in the organization.



© IIPM International. All rights reserved. **Let us look at each in detail.**

What is Quality?

Quality

Customer Satisfaction

Grade

Accuracy

Precision

Quality is the responsibility of each and everyone in the organization.

Quality:

Quality is defined as “the degree to which a set of inherent characteristics fulfils requirements.”

What is Quality?

Quality

Customer Satisfaction

Grade

Accuracy

Precision

Quality is the responsibility of each and everyone in the organization.

Customer Satisfaction:

Customer Satisfaction is defined as “conformance to requirements and fitness for use”.

What is Quality?

Quality

Customer Satisfaction

Grade

Accuracy

Precision

Quality is the responsibility of each and everyone in the organization.

Grade:

Grade is defined as a design intent – is a category assigned to deliverables having the same functional use but different technical characteristics.

What is Quality?

Quality

Customer Satisfaction

Grade

Accuracy

Precision

Quality is the responsibility of each and everyone in the organization.

Accuracy:

Accuracy is defined as the degree of closeness to the actual value.

What is Quality?

Quality

Customer Satisfaction

Grade

Accuracy

Precision

Quality is the responsibility of each and everyone in the organization.

Precision:

Precision is defined as the granularity of measurement.

What is Quality Management?

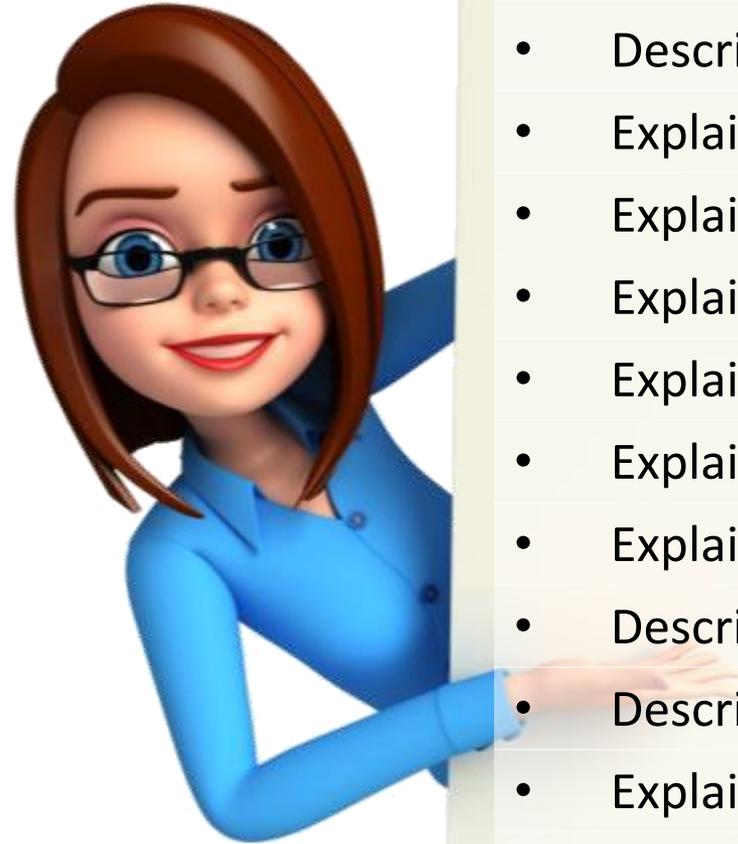


Quality management includes creating and following policies and procedures that meet the product's defined quality needs.

The aim of quality management is to ensure that the specified approach to quality is implemented for the processes.

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What is Total Quality Management (TQM)?

‘Total Quality Management’ or ‘TQM’ may be defined as a continuous pursuit of excellent quality by creating the right skills and attitudes in people to prevent defects and satisfy customers/users totally at all times.

You should understand that TQM is an organization-wide activity that involves an integration of various processes and has to reach every individual within an organization.



What is Total Quality Management (TQM)?

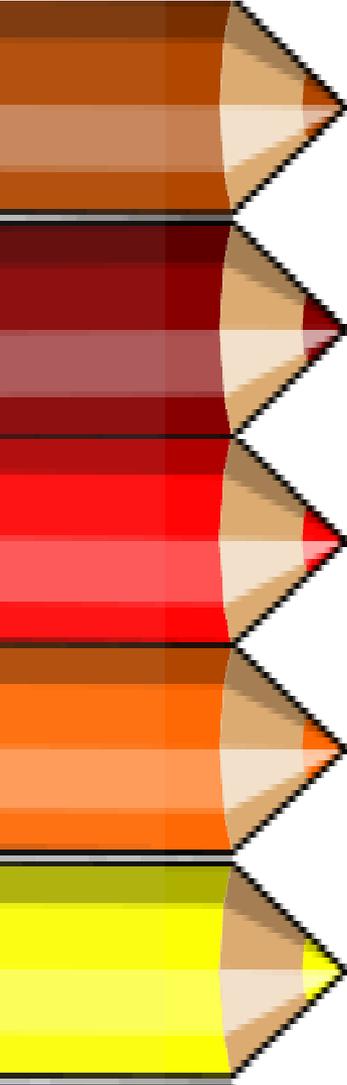
Oakland has defined TQM as follows:

- **“Total Quality Management (TQM) is an approach to improving the effectiveness and flexibility of business as a whole. It is essentially a way of organizing and involving the whole organization; every department, every activity, every single person at every level.”**

Zaire and Simintiras have defined TQM as follows:

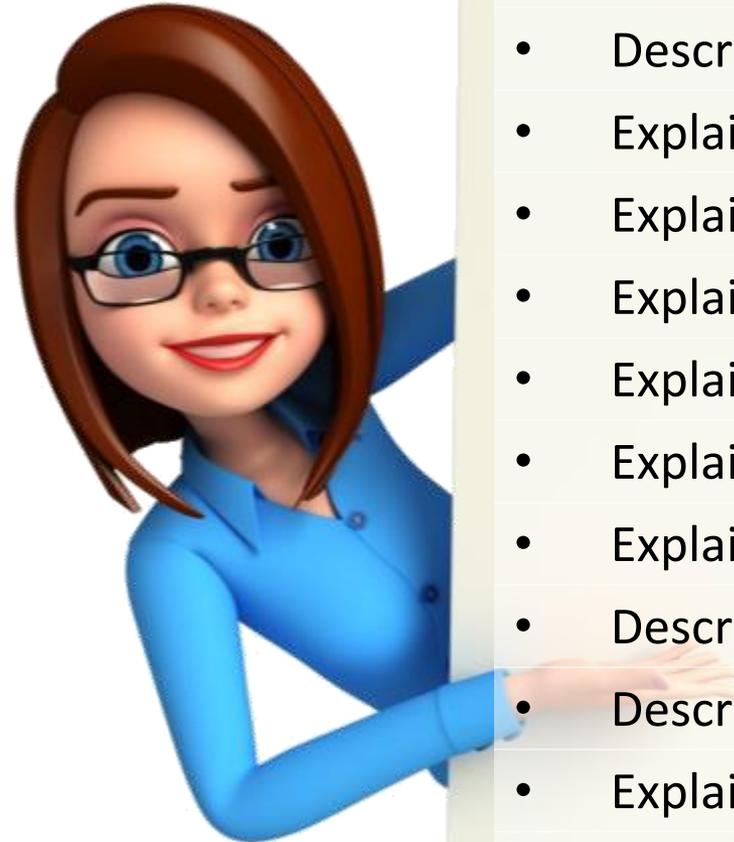
- **“Total Quality Management is the combination of the socio-technical process towards doing the right things (externally), everything right (internally) first time and all the time, with economic viability considered at each stage of each process.”**

Overview of Total Quality Management

- 
- It is a methodology for continuous improvement.
 - It is a methodology for creating products/ processes that perform at high standards.
 - It is a set of statistical and other quality tools arranged in unique way.
 - It is a way of knowing where you are and where you could be!
 - It is a Quality Philosophy and a management technique.

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Evolution of TQM

The evolution of Total Quality Management (TQM) in history has taken place in four stages. These four stages are:

- **Stage 1: Quality Inspection (QI)**
- **Stage 2: Quality Control (QC)**
- **Stage 3: Quality Assurance (QA)**
- **Stage 4: Total Quality Management (TQM)**

Stage 1: Quality Inspection

- **Stage 1: Quality Inspection (QI)**



The first stage of TQM evolution is 'Quality Inspection'. Human beings have always been conscious of 'Quality'.

However, the first conscious step towards quality was seen in the first stage of TQM development in the 1910s.

In the 1910s, the Ford Motors introduced its new 'T' Model car. However, before the new cars hit the market, Ford Motors employed teams of inspectors to compare or test the product with the project standard.

Stage 1: Quality Inspection

- **Stage 1: Quality Inspection (QI)**

.....
This 'quality check' was applied at all stages from production process to delivery.

The main aim of this 'quality check' was to separate products of poor quality from those of acceptable quality.

The poor quality products found by the inspectors were then separated from the acceptable quality product and scrapped, reworked or sold as lower quality.



Stage 2: Quality Control

- Stage 2: Quality Control (QC)



The second stage of TQM evolution is 'Quality Control'.

This happened during the era of industrial advancement when the quality was controlled through supervised skills, written specs, measurement and calibration.

This stage started during the Second World War, when manufacturing industries got their products' quality checked by inspections rather than the workers themselves.

Stage 2: Quality Control

- **Stage 2: Quality Control (QC)**

Inspection was carried out for statistical quality control.

Hence, there was a post production effort to separate the good product from the bad product that was then developed.

This era was more successful in quality control than the previous years due to the development of control charts and sampling methods by Shewhart and Dodge-Romig during the period 1924-1931.



Stage 2: Quality Control

- **Stage 2: Quality Control (QC)**



It was during this stage that Shewhart introduced the idea that quality control can help to distinguish and separate two types of process variation such as follows:

- The variations resulting due to random causes and
- The variations resulting due to assignable or special causes

Shewhart also proposed that if one can separate the variation due to special causes, then a process can be made to function predictably. He also designed a control chart for monitoring such process control and lower evidence of non-conformance.

Stage 3: Quality Assurance

- **Stage 3: Quality Assurance (QA)**



The third stage of TQM evolution is 'Quality Assurance'.

The third stage of the development encompasses all the previous stages.

This is to ensure quality assurance to provide sufficient confidence that a product or service will satisfy customers' needs.

Stage 3: Quality Assurance

- **Stage 3: Quality Assurance (QA)**

The advancement in TQM from the era of 'Quality Control' to 'Quality Assurance' was achieved by various developments such as:

- Use of intensive quality manuals
- Use of cost of quality
- Development of process control
- Auditing of quality systems
- Stress upon prevention of bad quality rather than detection of bad quality



Stage 4: Total Quality Management

- **Stage 4: Total Quality Management (TQM)**



The fourth stage of TQM evolution is 'Total Quality Management'.

'Total Quality Management' or 'TQM' involves the understanding and execution of quality management principles and concepts in all aspects of business activities.

Stage 4: Total Quality Management

- **Stage 4: Total Quality Management (TQM)**

.....
Total Quality Management requires that principles of quality management must be applied at every level, every stage and in every department of the organization.

Also, application of sophisticated quality management techniques should be used to feed the idea of Total Quality Management philosophy.



Characteristics of Different Stages of TQM

Various American experts are credited with the development of Total Quality Management from 1950 onwards. Experts such as Dr Joseph Juran, Philip Crosby and Dr Edward Deming have contributed significantly towards the continuous development of Total Quality Management. The given table shows the characteristics of the different stages of TQM as it evolved from 1910 onwards:

Stage	Characteristics
Quality Inspection (QI) (1910)	Identify sources of non-conformance
	Sorting
	Taking Corrective Action
	Salvaging
Quality Control (QC) (1924)	Self-inspections
	Use of Performance data
	Use of Quality manual
	Carrying out Product testing
	Quality planning
	Use of statistics
	Use of Paperwork control

Characteristics of Different Stages of TQM

Stage	Characteristics
Quality Assurance (QA) (1950)	<ul style="list-style-type: none"> Use of Quality manual Quality planning Quality costs Third-party approvals Using Process control Failure mode and effect analysis Monitoring of Non-production operations Carrying out Systems audits
Total Quality Management (TQM) (1980)	<ul style="list-style-type: none"> Having a Focused vision Internal customer Prevention Continuous improvements Performance measure Management leadership Interdepartmental barriers Company-wide application

MCQ

Q. Which of the following year represents the beginning of 'Quality Assurance' (QA)?

- 1910
- 1924
- 1950
- 1980

Click on the radio button to select the correct answer!

Aspects of Total Quality Management

The three aspects to Total Quality Management (TQM) are:



Let's look at each in detail. © IPM International. All rights reserved.

Quality Planning



Quality Planning

- Determine a plan for quality.
- A major task is preparation of the quality management plan.

Quality Assurance



Quality Assurance

- Determine if the processes are complying with the organizational (as well as project) policies and procedures.
- A major task is conducting regular process audits.
- Results of the audit are taking corrective and preventive actions.

Quality Control



Quality Control

- Measure specific process results such as a product against standards.
- A major activity is to inspect and verify the product, repair defects, and measuring whether the quality indicators are improving.

Did you know?

Roll your mouse over the icon, to learn more.

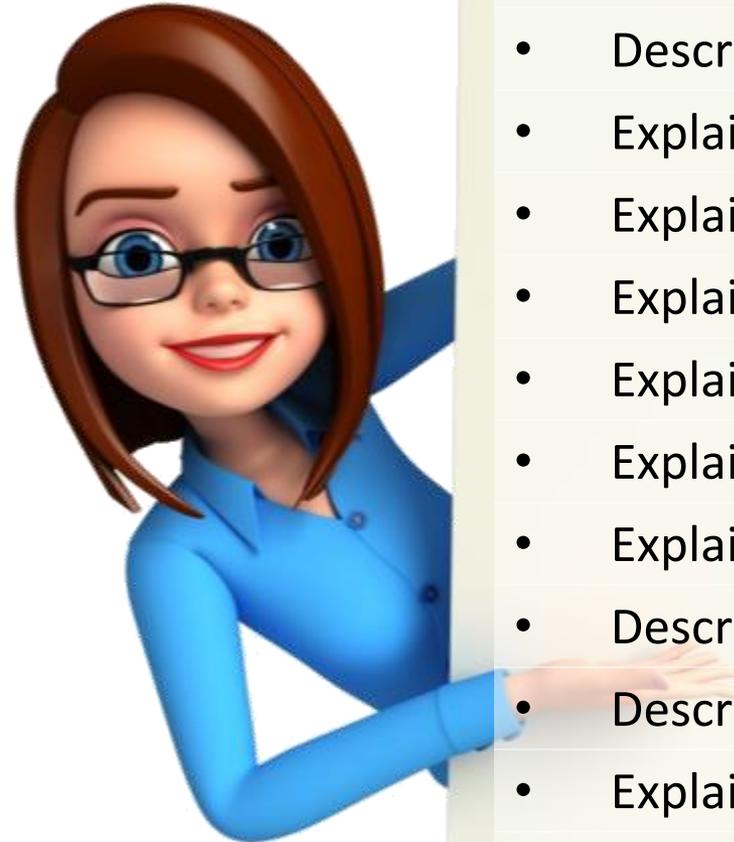
Did You Know?



TQM is an approach to improving the effectiveness and flexibility of business as a whole. It is essentially a way of organizing and involving the whole organization; every department, every activity, every single person at every level.

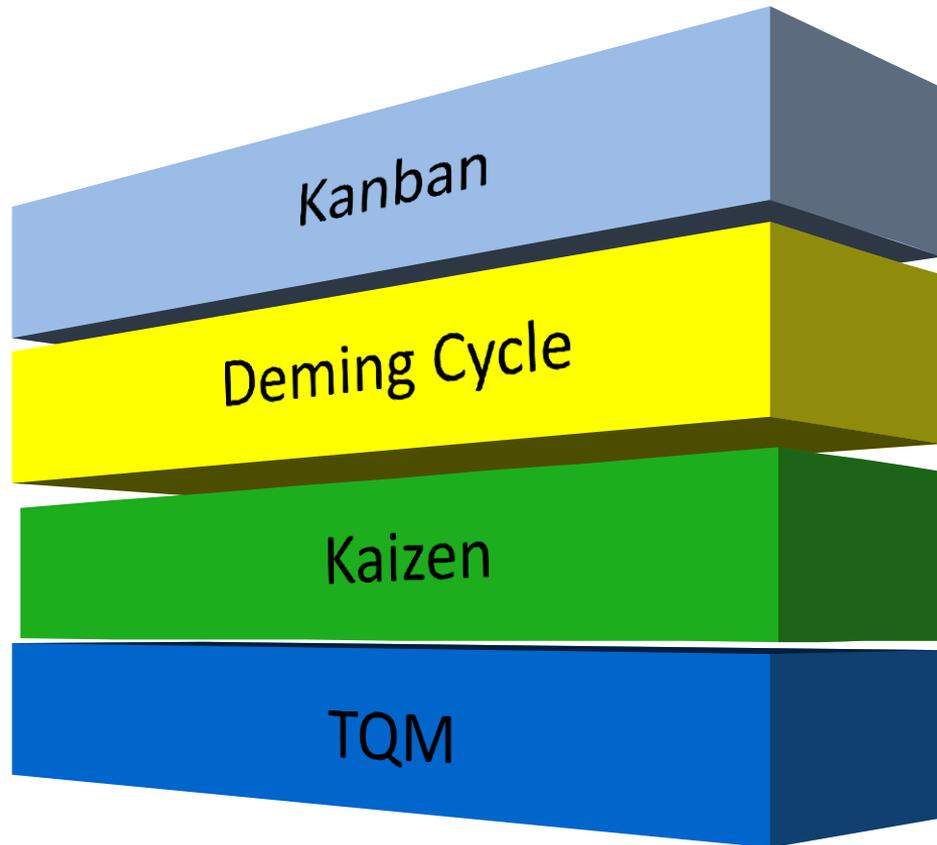
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Concepts in Total Quality Management

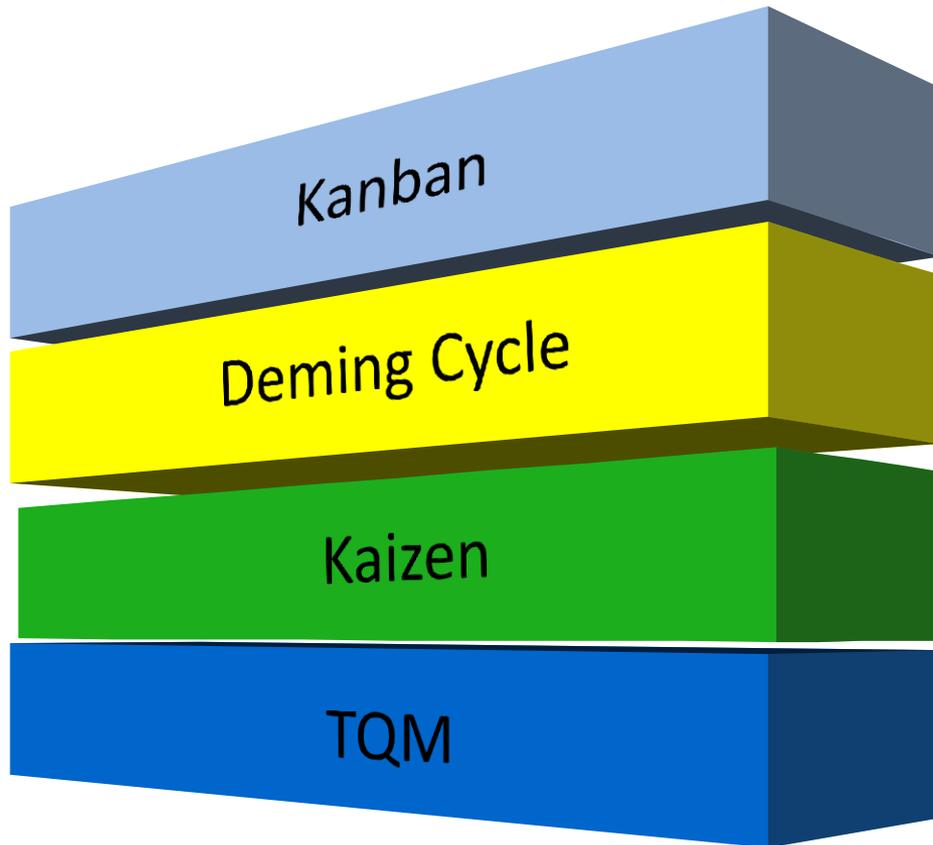
Some of the most important concepts in Total Quality Management (TQM) are:



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Total Quality Management (TQM)

Some of the most important concepts in Total Quality Management (TQM) are:

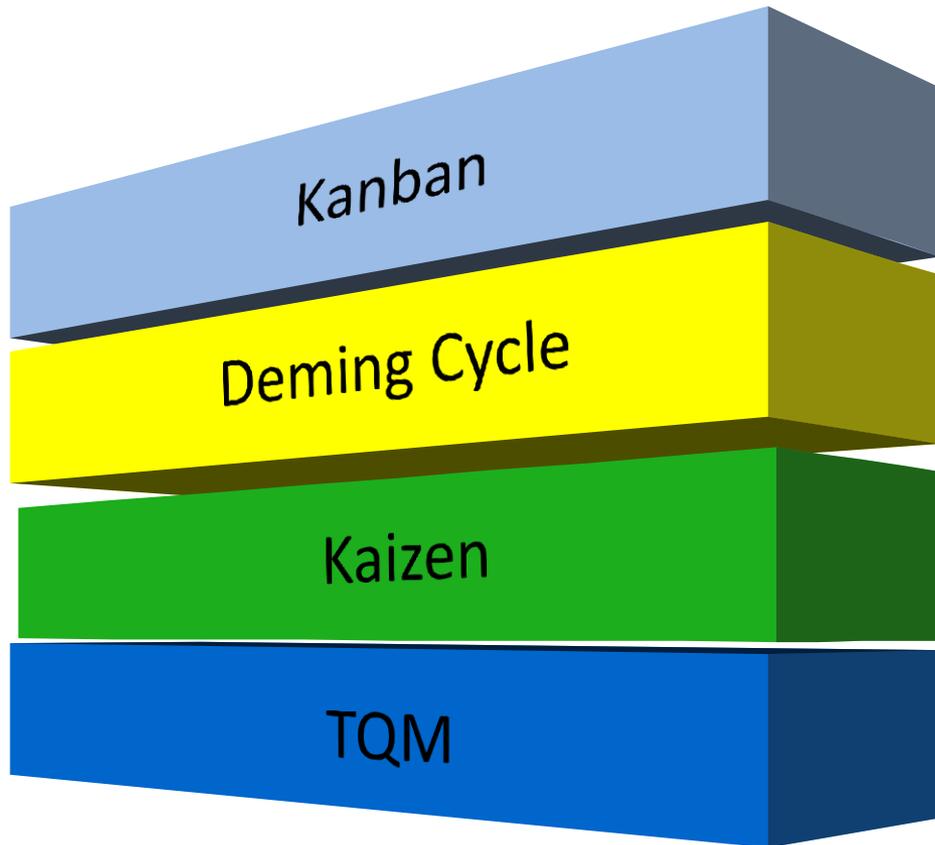


Total Quality Management (TQM):

- Total Quality Management (TQM) is an integrated management philosophy around quality and continuous improvement

Kaizen

Some of the most important concepts in Total Quality Management (TQM) are:

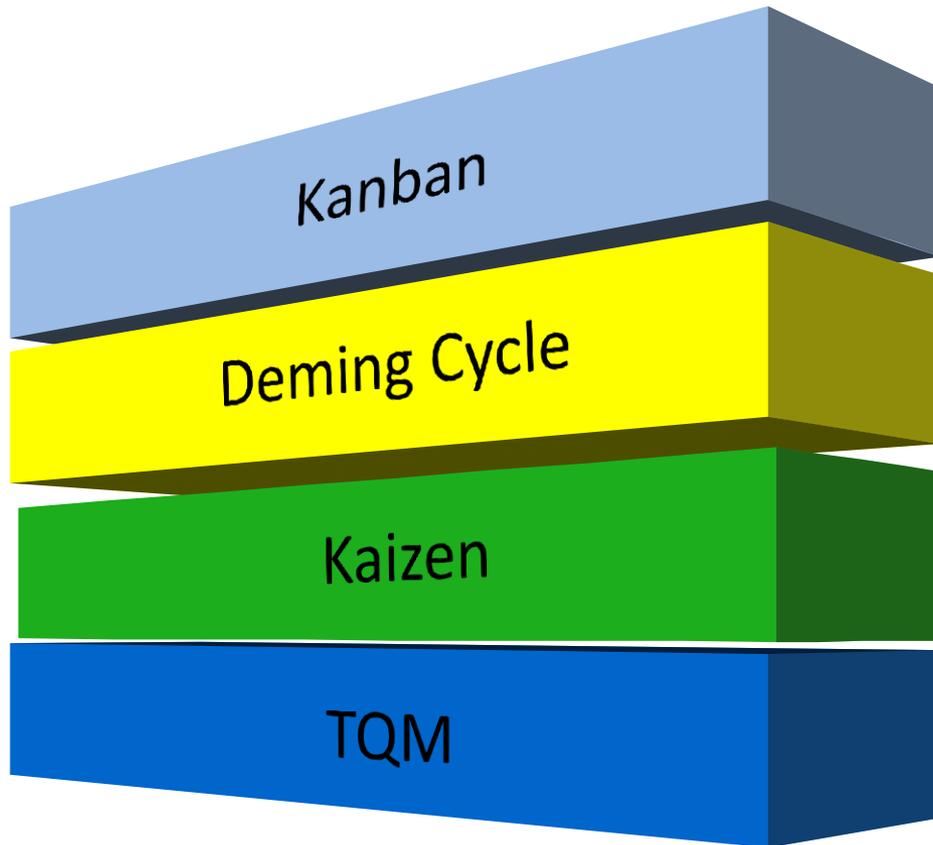


Kaizen:

- Japanese for “Change for better”.
- Small, continuous improvements

Deming Cycle

Some of the most important concepts in Total Quality Management (TQM) are:

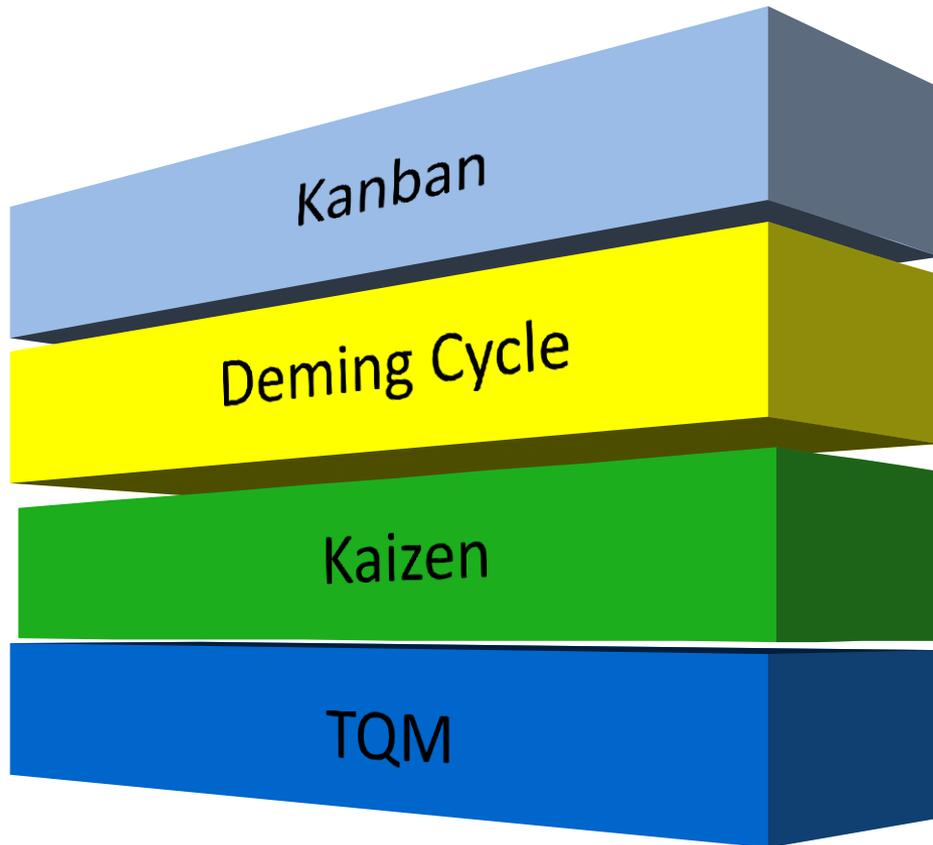


Deming Cycle:

- Plan-Do-Check-Act.
- A framework for process control and improvement

Kanban

Some of the most important concepts in Total Quality Management (TQM) are:



Kanban:

- A “pull-based” inventory management system based on the principle of Just-In-Time (JIT)

What is Quality Planning?

Quality Planning is the process of identifying quality standards that are applicable to your product and determining how your product will meet these standards.



Quality Planning

- **Quality is a specialized subject**
- **There are many texts and scholarly articles written by quality gurus like Crosby, Juran and Deming, which should be studied by project managers while planning for quality**
- **The common theme is that quality should be planned it should not be inspected or brought in as an afterthought**
- **There are many process frameworks that are used for quality planning, including ISO 9000, Total Quality Management (TQM), Six Sigma, etc.**
- **Your organization may also have a corporate quality policy which should be used to guide the quality planning processes for the project**

Quality Management Plan

The quality management plan describes how the company's employees will carry out the quality policy. It documents the outputs from the quality activities that were performed, the procedures used to complete the quality activities, and the resources required.



Quality Management Plan

The Quality management plan should clearly outline the quality goals.

It must also mention the specific activities that will be carried out to ensure quality.

It should also mention any specific quality standard or framework used in the process.

It must also say how the process will ensure that the plan is being carried out during execution (for instance by using metrics, checklists, etc.)

Quality Metrics

A quality metric is a standard of measurement that specifically defines what will be measured and how it will be measured.



Quality Metrics

Metrics can be defined for any area of the process.

For example:
Number of defects found

For example:
Percentage of tickets converted to product defects

For example:
Growth or decline in defects found over a given period, etc.

Quality Checklists

A quality checklist is a tool that lists a series of steps that must be taken to complete an activity or process. As each step is completed, it is marked off the list. This provides documentation that the steps were completed and can also be used to track when the step was taken and who performed the work.



Quality Checklists

Sample checklist for signing off a release could be:

All features completed and tested

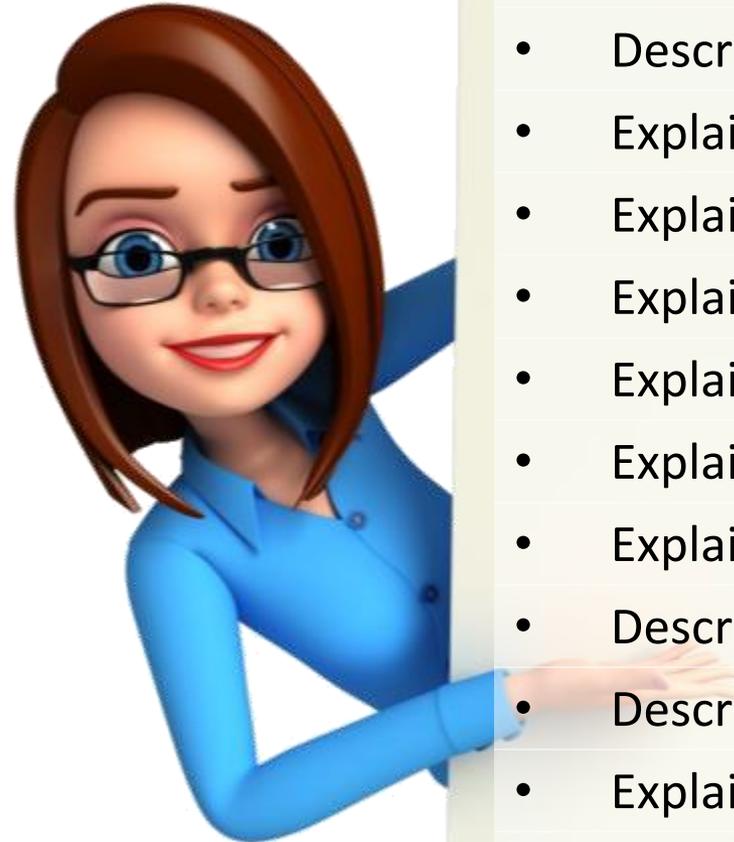
No priority-1 or 2 defects remaining

Stability testing completed

User acceptance testing completed,
etc.

Objectives

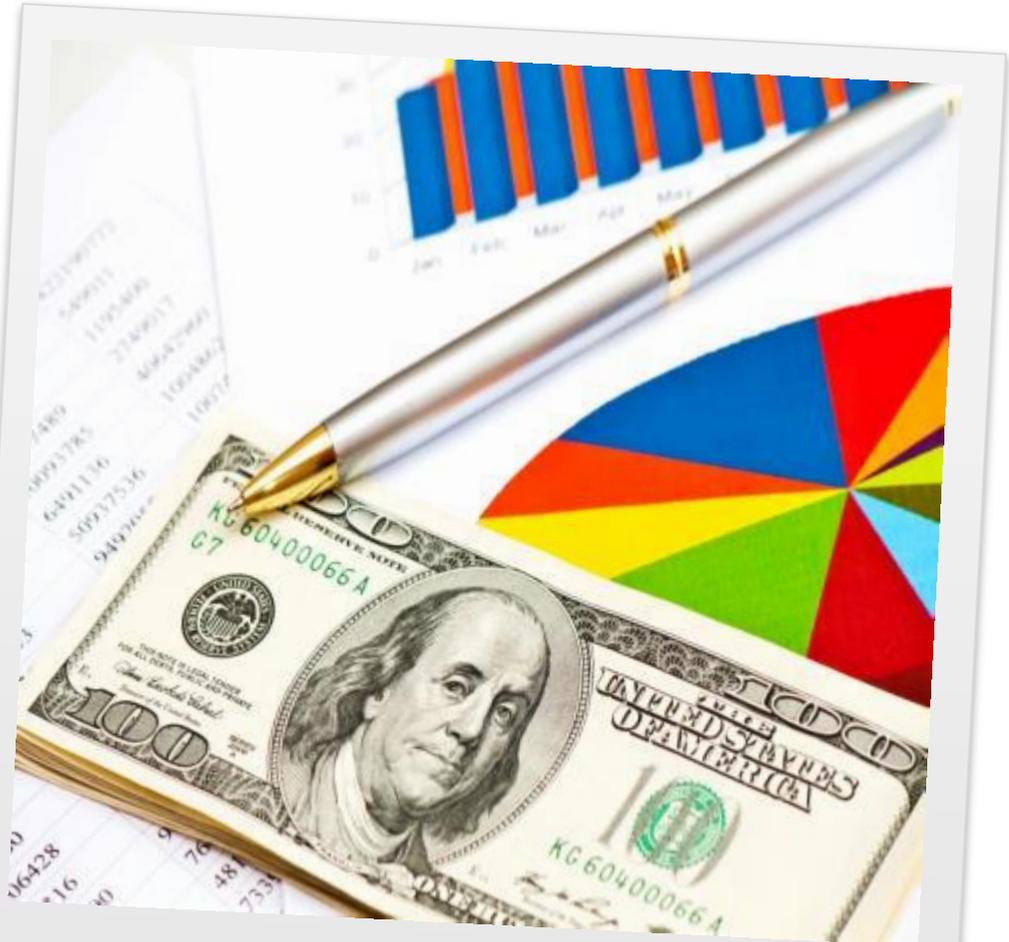
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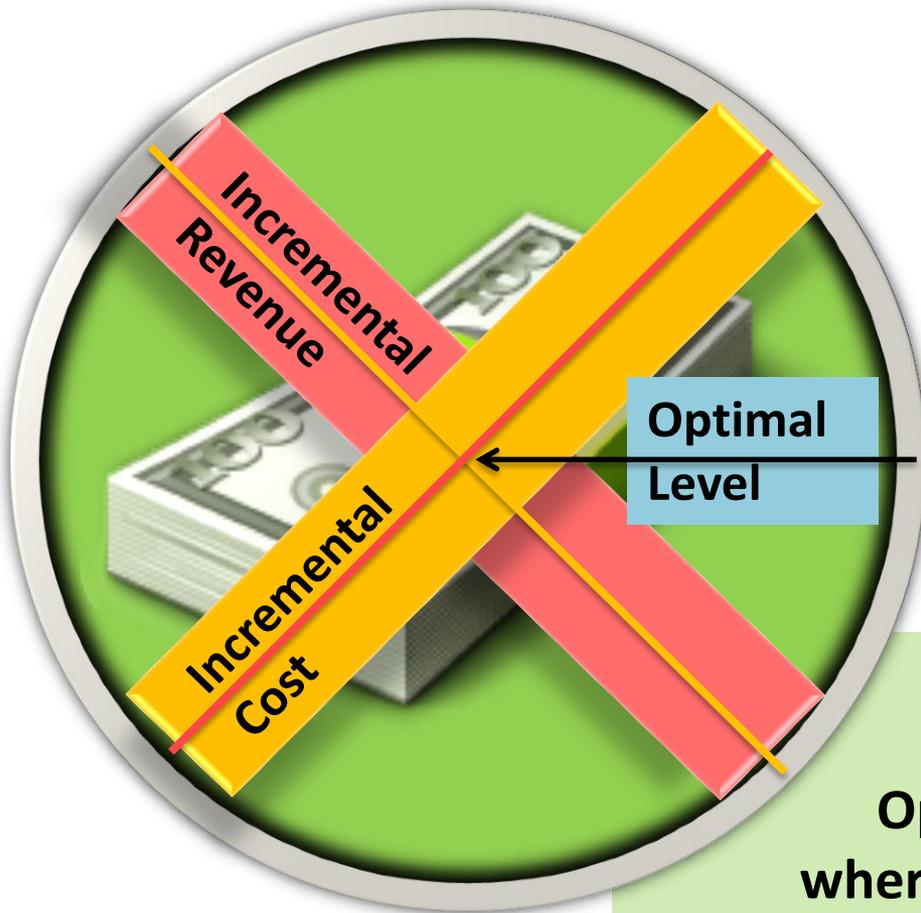
Cost Benefit Analysis

Cost-Benefit Analysis compares the cost of improving quality with the additional benefits that improved quality will provide

You should understand that 'Quality comes at a cost'.



Cost Benefit Analysis



Optimal quality is reached at the point where the incremental revenue from improvement equals the incremental cost to secure it.

Cost of Quality

Cost of Quality includes all costs incurred over the life of the product by investing in preventing non – conformance to requirements and ensuring that the product conforms to requirements.



Cost of Quality

The two main elements of Cost of Quality are:



Let's look at each in detail.

Cost of Conformance

- Cost of Conformance is the investment made or money spent)in preventing failures, that is, in trying to ensure that the product conforms to the specifications.
- Cost of Conformance includes:
 - Prevention costs
 - ❖ Training
 - ❖ Documentation
 - ❖ Equipment
 - ❖ Time to do it right
 - Appraisal costs
 - ❖ Testing
 - ❖ Destructive testing loss
 - ❖ Inspections



Cost of Non-Conformance



Cost of
Non-Conformance

- Cost of Non-Conformance is the money spent during or after the project in recovering from or addressing failures.
- Cost of non-conformance is sometimes called failure cost.
- Cost of Non-Conformance includes:
 - Internal failure costs
 - ❖ Rework
 - ❖ Scrap
 - External failure costs
 - ❖ Liabilities
 - ❖ Warranty work
 - ❖ Lost business

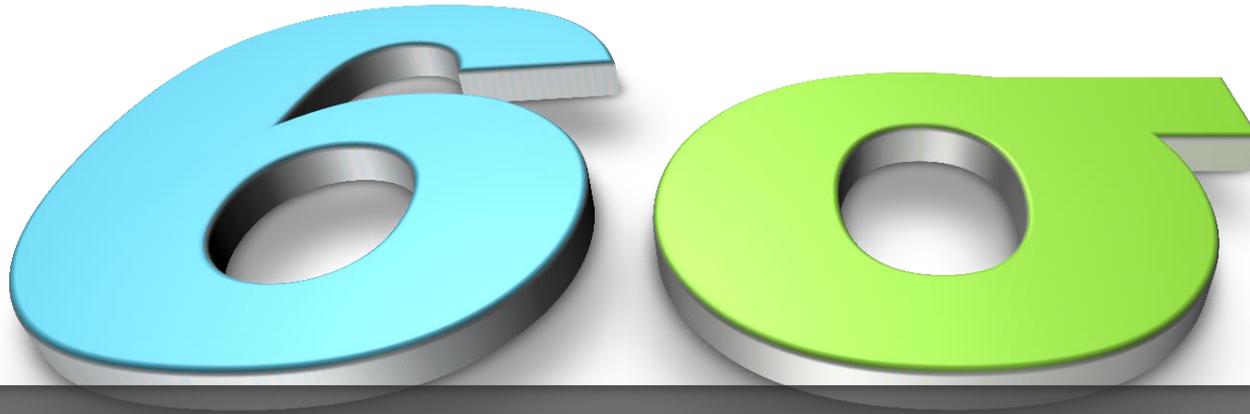
MCQ

Q. What does the acronym 'COQ' stand for?

- Cost of Quality
- Continuous Optimum Quality
- Commitment of Quality
- Conformance to Quality

Click on the radio button to select the correct answer!

What is Six Sigma?



Six Sigma is the measure of quality that strives for near perfection.

It is a disciplined, data-driven methodology focused on eliminating defects.

A Six Sigma defect is defined as anything that falls outside of a customer's specifications.

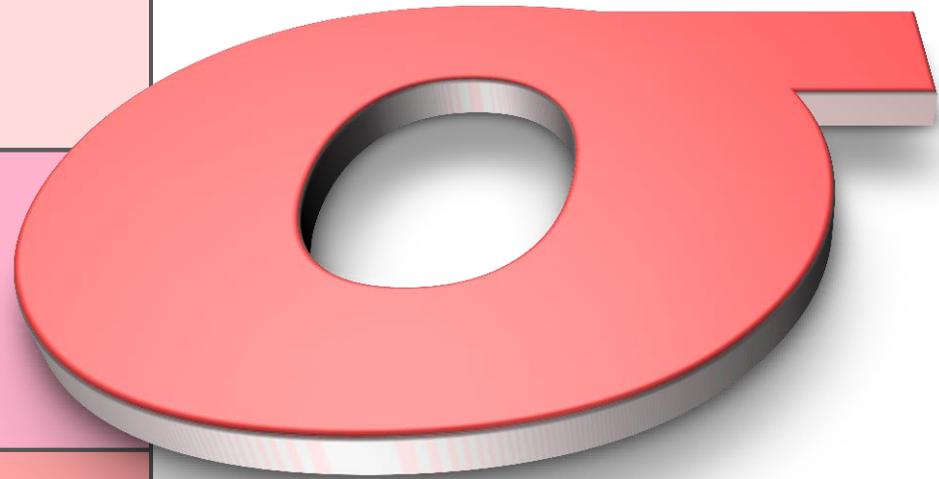
Six Sigma is a reference to a statistical measuring system, equivalent to just 3.4 defects per every million opportunities (Snee, 2003).

What do we mean by Sigma (σ)?

Sigma stands for standard deviation

It represents the average variation from the mean (average) value

The smaller is the standard deviation the smaller is the amount of variation in the process.



Real Life Example

Let us now look at a real life example to understand the spread of TQM across countries.

Real Life Example

It has been found that TQM has been widely accepted across the globe and almost every organization tries to follow and implement TQM. However, experts have found that most organizations rush into TQM to prove to the world that the TQM philosophy is being followed in their organization. The organizations do this without a proper understanding of TQM. Most of the times organizations fail to understand the difference between TQM and quality control.

Let us now try to understand the spread and acceptability of TQM across several countries.



Real Life Example

'Made in Japan' was similar to meaning 'poor-quality products' throughout the 1950s. However, today it means exactly the opposite. Japanese products are now world renowned for their quality, technology and ingenuity. This is the reason that Japanese products are much desired by consumers throughout the world. This complete turnaround has been achieved by Japan due to the implementation of total quality management in every walk of life. In 1949, a special group was organized in the Union of Japanese Scientists and Engineers with an aim to providing an educational programme to promote quality control in Japanese companies.



Real Life Example

In 1950, Dr W.E. Deming from the United States was invited to deliver a lecture on 'Statistical Quality Control' (SQC). The years 1946 to 1950 were declared the years of 'Statistical Quality Control' (SQC). This led to the setting up of various statistical control techniques and quality control education programmes for a stringent quality control. However, it was found that the top management remained distant from these quality control activities. Then, in 1954, Dr J.M. Juran's lecture on 'Planning and Practice in Quality Control' changed the face of quality in Japanese companies.



Real Life Example

The period between 1955 and 1960 was denominated as the 'Years of Total Quality Control (TQC)'. It was during this period that quality control activities were supported by top management.

Also, company-wide quality control programs were launched. Ishikawa has outlined the following key considerations for implementing successful company-wide quality control programmes in Japanese companies:

- Involvement of top management
- Stress on training and education
- A schematic organization of quality
- Use of non-official quality control circles
- Awarding achievements
- Having lots of patience



Real Life Example

In earlier years, the world markets were dominated by American businesses. However, in the late 1970s, American companies realized a threat from Japanese corporations. The American companies soon realized that the key to Japan's success lied in quality management and quality control. Hence, American companies started to focus on quality management and the statistical techniques proposed by Deming, Feigenbaum, Crosby, Juran and Geoffrey. It has been found that conventional American industries are still not practising quality management in its totality.



Real Life Example

Studies have also found that most US manufacturers are in the preliminary stages of quality control implementation. Also, most American companies extensively use quality control techniques in manufacturing processes, but most of them do not use quality control techniques in design and engineering, research and development and other areas. Also, as compared to Japanese firms, American firms do not have a higher level of worker involvement and do not use simple SQC tools. Lack of top management participation in quality management programs has been the main cause of failure of quality practices in American companies.



Real Life Example

In Europe, some countries such as Germany, the UK, France and Italy have been the forerunners in adopting TQM.

However, studies have indicated that majority of the companies in the UK still have conventional attitudes towards quality management.

However, the enormous changes in the European market have acted as a driving force for TQM implementation.



Real Life Example

Today, majority of the European companies tend to focus on quality improvement processes, quality-related education and the relationship of the companies to the outside world in pursuing quality. The quality improvement in European countries has received a new force due to the adoption of BS 5750 and ISO 9000; although the industries previously had a conventional approach towards quality matters. Focus on quality improvement is supported by a commitment from the top management commitment through better investment and rewards.



Real Life Example

The products manufactures in the developing nations have today become synonymous with poor quality products.

In fact, some of these countries were well-known a few centuries ago as the best manufacturers of quality goods.

However, they are now known to produce poor quality products.

Many factors have contributed to this change such as severe restraints on their economies, missing political will, missing education and training and lack of dedication.



Real Life Example

Studies have found that companies in these developing nations do not understand the concepts of quality management.

Quality is regarded as an optional extra and so their production function is kept detached from the quality function.

However, now some planned efforts towards quality are being made in some of the developing countries due to changes in global markets, an increase in competition, changes in import-export policies and increased customer consciousness.



Real Life Example

The following are some of the key aspects that most organizations in the developing world suffer from:

- **Deficiency of employee involvement and participation in quality improvement process**
- **Low level of education**
- **Regarding quality as an optional extra and not a necessity for development.**
- **Conventional belief that 'quality costs money'**
- **Outdated technologies**
- **Deficiency of communication and trust between suppliers, dealers, management and trade unions**



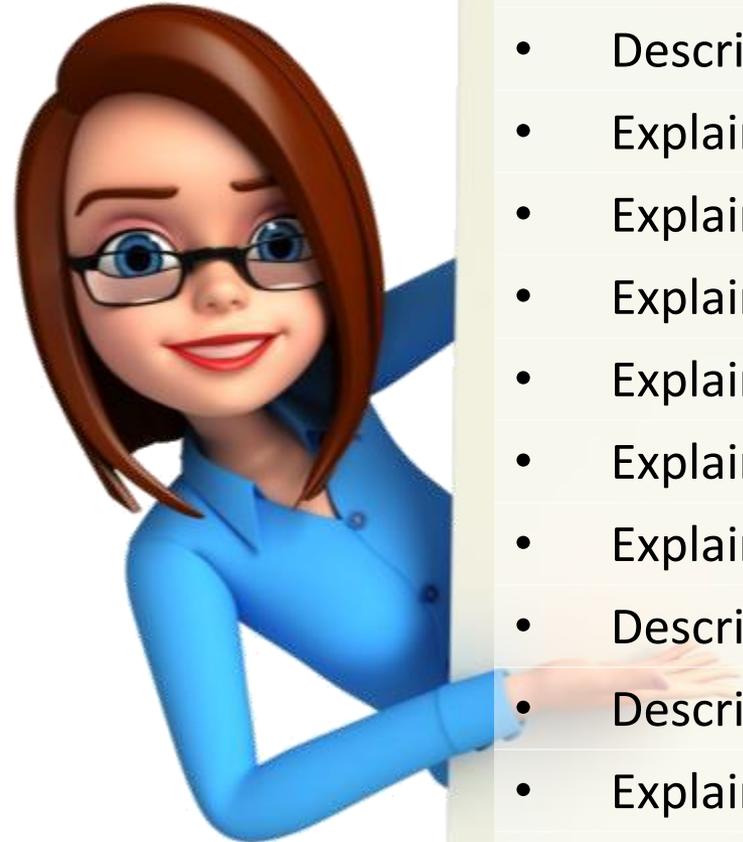
Real Life Example

- **Disorganized and neutral attitude of customers**
- **Deficiency of laid down quality standards and poor test facilities**
- **Deficiency of management commitment and motivation**
- **Insignificant amounts of capital investment in technologies, research and development and employees' education, etc.**
- **Deficiency of political support**
- **Unwanted social tensions such as violence, religious fundamentalism, terrorism, etc.**

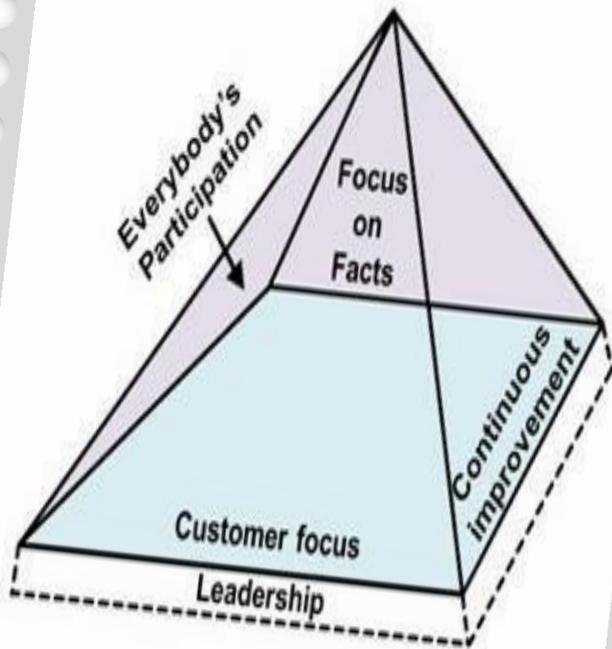


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The TQM Pyramid



There is a need to build a brand new management pyramid as 'The Quality Journey' firmly believes in demolishing out-of-date management pyramids.

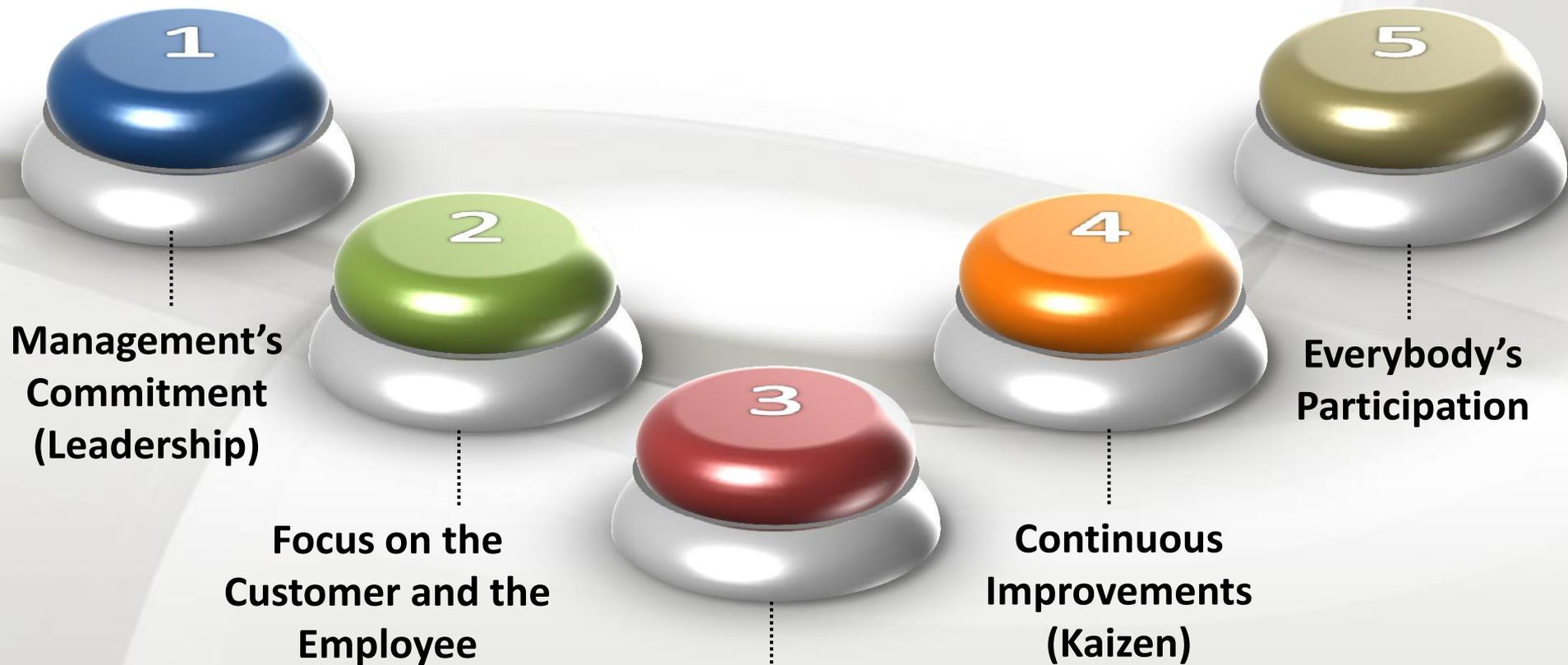
This new pyramid known as the 'TQM pyramid' is built such that it can live up to the vision and demands inbuilt in the definition of TQM.

The TQM Pyramid is a simple pyramid with a base foundation and four sides.

Hence, TQM is built and relies on the five principles represented by the four sides and base of the TQM Pyramid.

The TQM Pyramid

The five principles by which TQM is characterized are:



Management's Commitment (Leadership)



TQM requires a complete commitment from the management or leadership of a company. Also, it is crucial that the management should formulate quality goals, quality policies and quality plans in conformity with the four sides of the TQM Pyramid.

Also, it is crucial that the formulated goals, policies and plans must be clear and meaningful to all employees of the firm.

The quality goals of a company help in giving a clear indication to all employees as to what is going to be achieved regarding quality.

Management's Commitment (Leadership)



Whereas, the quality policies of a company help in describing in more detail about how employees have to achieve those quality goals.

Meaningful action plans should then follow the formulation of quality goals and quality policies.

Companies should focus on both short-term plans or one-year plans and long-term plans or about three-year plans.

Also, these plans should undergo an annual quality audit and the plans should be revised annually in accordance with the findings of the audit.

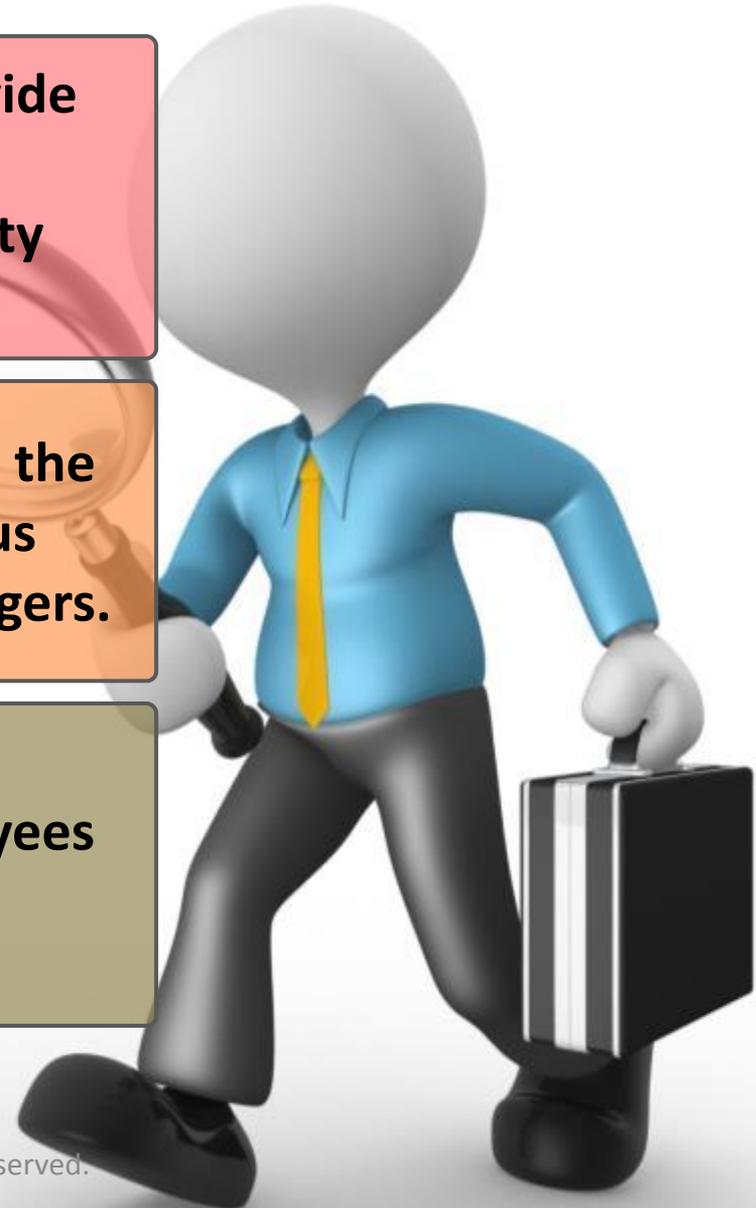
Annual Quality Audit

- **A crucial component of TQM is the annual quality audit.**
- **Hence, it is natural that it requires the active participation of the top management.**
- **An active participation by the top management in the annual quality audits would prove that it has understood the TQM message.**
- **Such active participation by top is also crucial for drawing up new action plans and reinforcing to the employees that the customer is top priority; and not the product.**



Annual Quality Audit

- **These annual quality audits help to provide understanding of the problems that the company has faced in realizing the quality plan.**
- **It is during this annual quality audit that the top management can put forward various relevant questions to department managers.**
- **By asking these questions, the top management can check whether employees are earnestly trying to accomplish the company's quality goals.**



Annual Quality Audit

The following are the important questions that the top management should seek from the department managers:

- What are quality problems and defects are faced by the company?
- How have 'customers', that is, both internal and external customers been identified?
- How have customers' necessities and anticipations been identified?
- How have managers and employees tried to satisfy customers?
- What do customers think of our products and services and how has this information been collected?



Benchmarking

- **Benchmarking is a technique that uses similar activities as a means of comparison.**
- **Benchmarking essentially relies on comparisons**
- **Comparisons could be with your own past performance or with competitors or industry standards or any well known standard**
- **Benchmarking lets you know where you stand with respect to the benchmark and what is the gap between current and desired level**
- **Commonly used benchmarks could be with regard to productivity, defect rate, cost/schedule performance, etc.**

Role of Management in TQM Implementation

It is just not enough that the management is committed towards TQM. It is equally crucial that the management should also undertake the further implementation of TQM. The following are the key points that management ought to do for implementing TQM:

- **Management must carefully consider and be in agreement about goals, stipulations and obstructions that are present to the introduction of TQM.**
- **Management must have the bravery to break away from set standards and customs.**
- **Management must convey that every function and every job has its own customers and suppliers.**



Role of Management in TQM Implementation

- **Management must extremely quickly build up a system to propose the carrying out of continuous improvements throughout the firm.**
- **Management must ascertain active participation from each and every employee in the company in the form of a team such as a work team, quality circle etc.**
- **Management must explain to employees the reasons that make carrying out the changes necessary and that the management would involve everyone in the company.**
- **In order to build a new 'quality organization', management must appoint a manager for quality improvements and should be allowed to have direct access to top management.**



Focus on the Customer and the Employee



The service management movement of the 1980s was all about focusing on the customer and the customer's demands and anticipations.

However, the approach towards focusing on the customer is a little different in TQM.

In TQM, focusing on the customer means:

- **Focusing on Both External Customers and Internal Customers**
- **Exceeding Customer's Expectations to Create Customer Satisfaction**

Focus on the Customer and the Employee



Focusing on Both External Customers and Internal Customers: TQM conveys that apart from focusing on external customers and their expectations and demands, it is also essential to focus on so-called internal customer and supplier relations.

Exceeding Customer's Expectations to Create Customer Satisfaction: TQM conveys that it is not enough to just fulfil the customer's expectations in order to create customer satisfaction.

Let us look at each in detail.

Focusing on Both External Customers and Internal Customers

TQM conveys that employees are also a part of the company's processes. Hence, only when companies have good, devoted and satisfied employees can quality be improved at a lower cost which will then further lead to lower production costs.

So, TQM suggests that before trying to satisfy your external customers, you must first strive to satisfy your employees so favourable conditions are created that will help them to produce and deliver quality. Another aspect with respect to focusing on internal aspect of the company is to look at the internal processes within a company.



Focusing on Both External Customers and Internal Customers

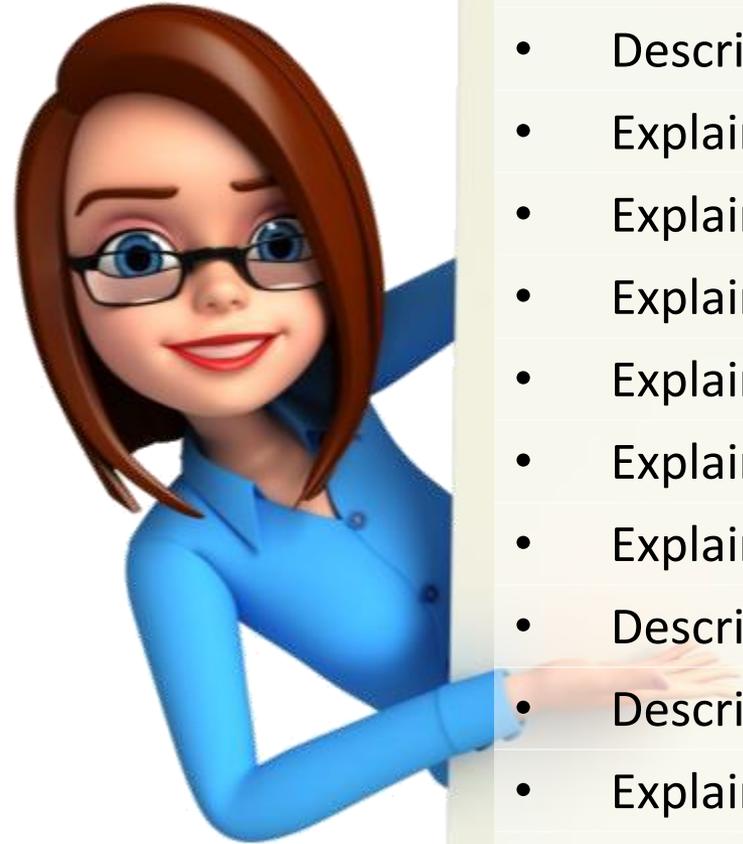
This is because improvements ought to be process-oriented. A company is nothing but a series of connected processes, of which employees are a part. Therefore, quality improvement can be achieved by the management by looking at the company's processes.

The first step towards becoming a 'TQM company' is to ensure that employees know what both internal and external customers want/expect of them. Employees can then use this information to start improving the processes.



Objectives

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- List the Benefits of TQM



Exceeding Customer's Expectations to Create Customer Satisfaction

1

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The concept of exceeding customer's expectation to create customer satisfaction has been associated with Professor Noriaki Kano of Tokyo Science University. Professor Noriaki Kano proposed an expanded concept of quality which he formulated in 1984. According to Professor Kano, the following are the five types of quality:

Expected/Must-be Quality

1

Expected / Must-be Quality

2

- **‘Expected Quality’ or ‘Must-be Quality’ means the level of quality that is expected by your customers from your product.**
- **This means that companies should have a thorough knowledge about what the customers expect in order to build products of expected quality so as to live up to the customers’ expectations.**
- **Also, you should understand here that if these ‘expected quality’ parameters are not fulfilled by a product, then customers tend to surely become dissatisfied.**

3

4

5

Proportional Quality

1

2

Proportional Quality

3

4

5

- **‘Proportional Quality’ or ‘One-dimensional Quality’** means that if the product or service-or an attribute of a product or service lives up to some agreed physical condition then for some people satisfaction will be the result and if not, then dissatisfaction will become the result.
- You should understand here that what is proportional quality to one customer may be regarded as expected or value-added quality by another customer.

Proportional Quality

1

2

3

4

5

Proportional Quality

- *In the earlier years, quality management was dominated by this 'one-dimensional quality view'.*
- *However, in today's world TQM has gained importance because customers are more complicated to satisfy easily.*
- You should understand that if the people will be satisfied with the quality to be provided by one customer may be regarded as expected or varied quality by another customer.

Exciting/Charming/Value-Added Quality

1

2

3

**Exciting /Charming /
Value-Added Quality**

4

5

- **Most of the customers do not get satisfied when a product just meets their expectations.**
- **For such customers, expected quality in a product would just help to remove the dissatisfaction rather than create customer satisfaction.**

Exciting/Charming/Value-Added Quality

1

2

3

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5

Such customers demand more for creating satisfaction.

This 'more' is what Kano calls 'exciting quality' or 'charming quality' or 'value-added quality'.

The 'exciting quality' or 'value-added quality' means that the company has added one or more qualities to the product or service in addition to those that the customer expects.

- For such customers, the company must help to remove the dissatisfaction that prevents customer satisfaction.

Exciting/Charming/Value-Added Quality

1

2

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These extra qualities help to provide the customer extra value and create customer satisfaction and make him happy, satisfied, or excited with the product.

'Value-added quality' has a tremendous effect on customer satisfaction, while costs are often minimal.

However, you must bear in mind that it is not a static concept and that after a while, 'value-added qualities' become expected qualities.

- More
 - For such
- help to reduce customer dissatisfaction and increase customer satisfaction.

Indifferent Quality

1

2

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- A product or service consists of a large number of quality attributes.
- Out of these, some quality attributes are such that customers will always be neutral or indifferent if a specific attribute is or is not inherent in the product.
- This is the characteristic of 'indifferent quality'.

Indifferent Quality

Reverse Quality

1

2

3

4

5

- Some specific quality attributes are such that customers would become dissatisfied if that specific quality attribute is inherent in the product/service.
- On the other hand, customers become satisfied if these quality attributes are not present.
- Therefore, you can understand that these attributes have a reverse effect on customer satisfaction.
- Such quality attributes are known as 'reverse quality'.

Reverse Quality

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Roll your mouse
over the icon,
to learn more.

Did you
know?

Did You Know?

In 1989, a Gallup Survey of American corporate leaders undertaken for the American Society for Quality Control clearly showed that in an their eagerness to improve the processes, many firms totally forget their external customers.



MCQ

Q. Which of the following means the level of quality that is expected by your customers from your product?

- Value-added Quality
- Indifferent Quality
- Must-be Quality
- Proportional Quality

Click on the radio button to select the correct answer!

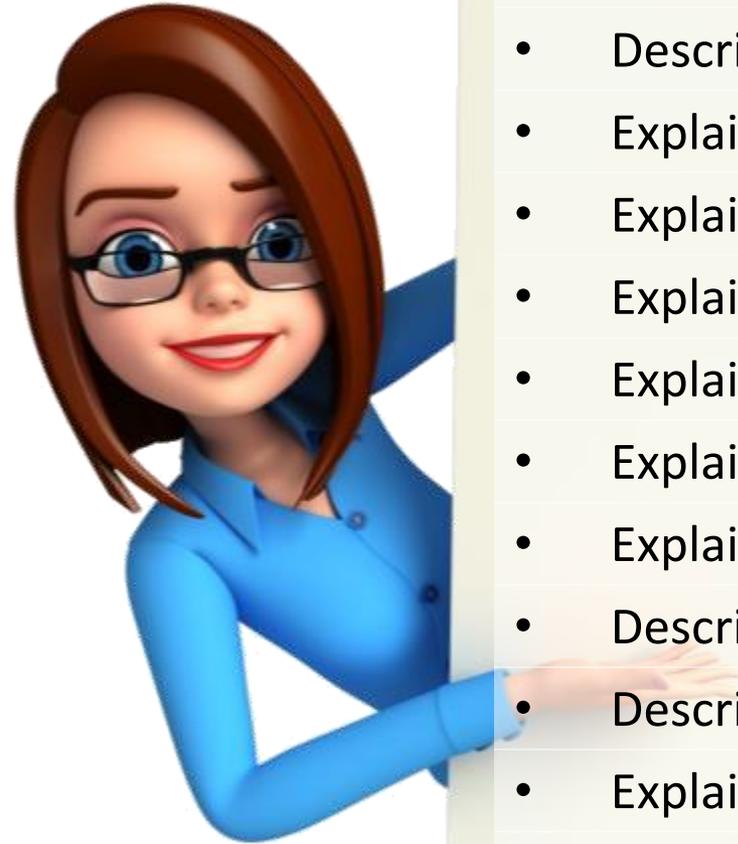
Focus on Facts



Focusing on various facts such as knowledge of customers' experiences of products and services is crucial before the processes necessary for creating customer satisfaction can be improved.

In order to achieve this, TQM requires that companies must set up a system for the continuous measurement, collection and reporting of quality facts.

Objectives



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Kinds of Measurements in TQM

The following are the kinds of quality measurements that are needed in TQM:

- **Customer Satisfaction Index (CSI)
or External Customers' Satisfaction**
- **Employee Satisfaction Index (ESI)
or Internal Customers' Satisfaction**
- **Quality Checkpoints and Quality Control Points**

Let us look at each in detail.

Customer Satisfaction Index (CSI) or External Customers' Satisfaction

- **Customer Satisfaction Index (CSI) or External Customers' Satisfaction**

You should always bear in mind that the various quality parameters to be used for measuring customers' satisfaction would vary greatly from one product to another.

The main use of the Customer Satisfaction Index (CSI) is to provide the company with a tool to choose the critical attributes of customer satisfaction and to allocate resources to these areas.



Customer Satisfaction Index (CSI) or External Customers' Satisfaction

- **Customer Satisfaction Index (CSI)
or External Customers' Satisfaction**

Here, we assume that customers evaluate the company on n different attributes or sub-areas, both with regard to quality of individual areas and the importance of these areas.

We let the resulting evaluation for the 'x' sub-area be C_i and the associated importance W_i .



Customer Satisfaction Index (CSI) or External Customers' Satisfaction

- **Customer Satisfaction Index (CSI) or External Customers' Satisfaction**

Hence, the overall customer satisfaction or the 'Customer Satisfaction Index' or 'CSI' is then calculated as a simple weighted average, as given below:

$$CSI = w_1 c_1 + w_2 c_2 + \dots + w_n c_n$$



Employee Satisfaction Index (ESI) or Internal Customers' Satisfaction

- **Employee Satisfaction Index (ESI) or Internal Customers' Satisfaction**

In TQM, satisfying external customers depends on having satisfied internal customers. TQM focuses not only on product quality but also 'human quality'.

Hence, TQM is all about ingraining quality into people. TQM believes that if a company can successfully inculcate quality in its employees, it would automatically create quality products.



Employee Satisfaction Index (ESI) or Internal Customers' Satisfaction

- **Employee Satisfaction Index (ESI) or Internal Customers' Satisfaction**

Every business is made up of three basic building blocks: hardware, software, and 'human ware'. TQM starts with 'human ware'. Hence, only when a company has taken care of its human quality aspects can it then focus on hardware and software aspects. Employee satisfaction is the key control points of 'human quality', which should be measured and balanced in the same way as customer satisfaction.



Quality Checkpoints and Quality Control Points

- Quality Checkpoints and Quality Control Points

We can measure the quality of the result of any process, that is, we can measure whether we are satisfied with a particular result.

When measuring the quality of a process result, we say that we have established a 'quality control point'.



Quality Checkpoints and Quality Control Points

- Quality Checkpoints and Quality Control Points

The most common internal quality measurement that can be used in most firms and processes as a control point is:

Total Defects per Unit = Number of Defects/Number of Units Produced or Tested

A defect is anything which causes customer dissatisfaction, whether specified or not. A unit was any unit of work.



Quality Checkpoints and Quality Control Points

- Quality Checkpoints and Quality Control Points

Imai in his famous book Kaizen in 1986 recommended supplementing quality control points with so-called 'quality check points'.

Imai calls 'Quality Control Points' as 'R Criteria' or 'Result Criteria', while he calls 'Quality Checkpoints' as 'P Criteria' or 'Process Criteria'.



Quality Checkpoints and Quality Control Points

- Quality Checkpoints and Quality Control Points

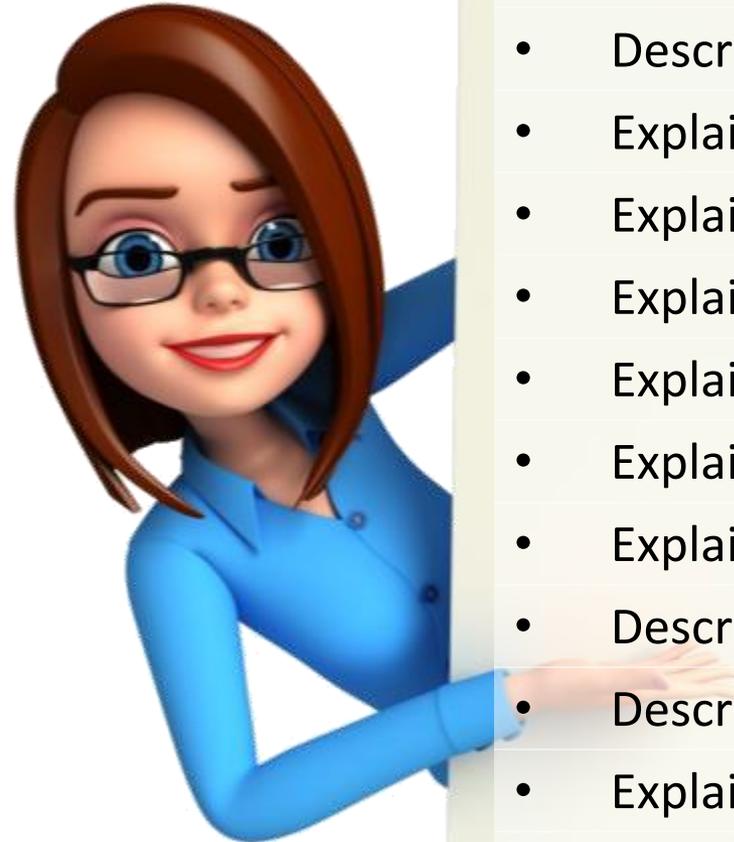
Hence, you can understand that a quality control point measures a given process result. On the other hand, a quality checkpoint measures the state of the process.

However, it is important that one or a few states are chosen, out of the many different states that can be measured.



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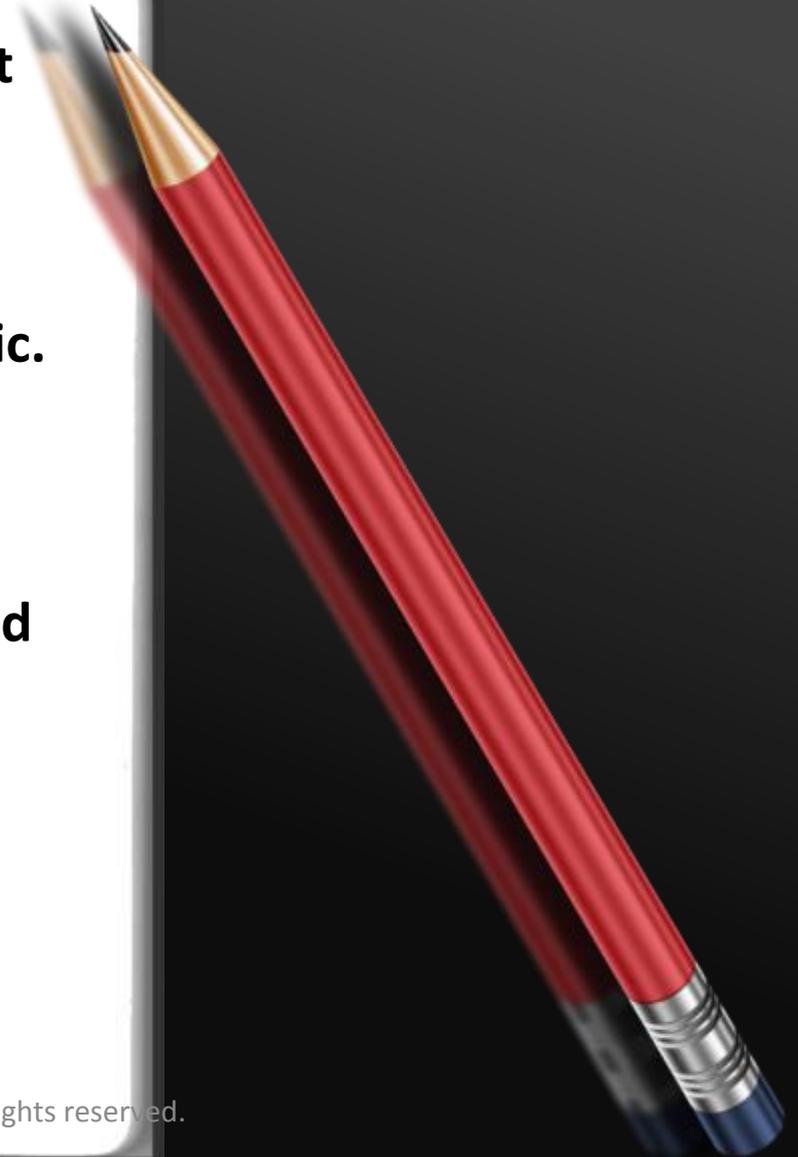


STINGER Principle

Many business managers are not sure about the need for measurements. They find measurements to be unneeded, time-consuming and bureaucratic. Such managers instead depend upon the 'STINGER' Principle:

The acronym 'STINGER' is defined as follows:

- **ST: STrength**
- **IN: INTuition**
- **G: Guts**
- **E: Experience**
- **R: Reason**

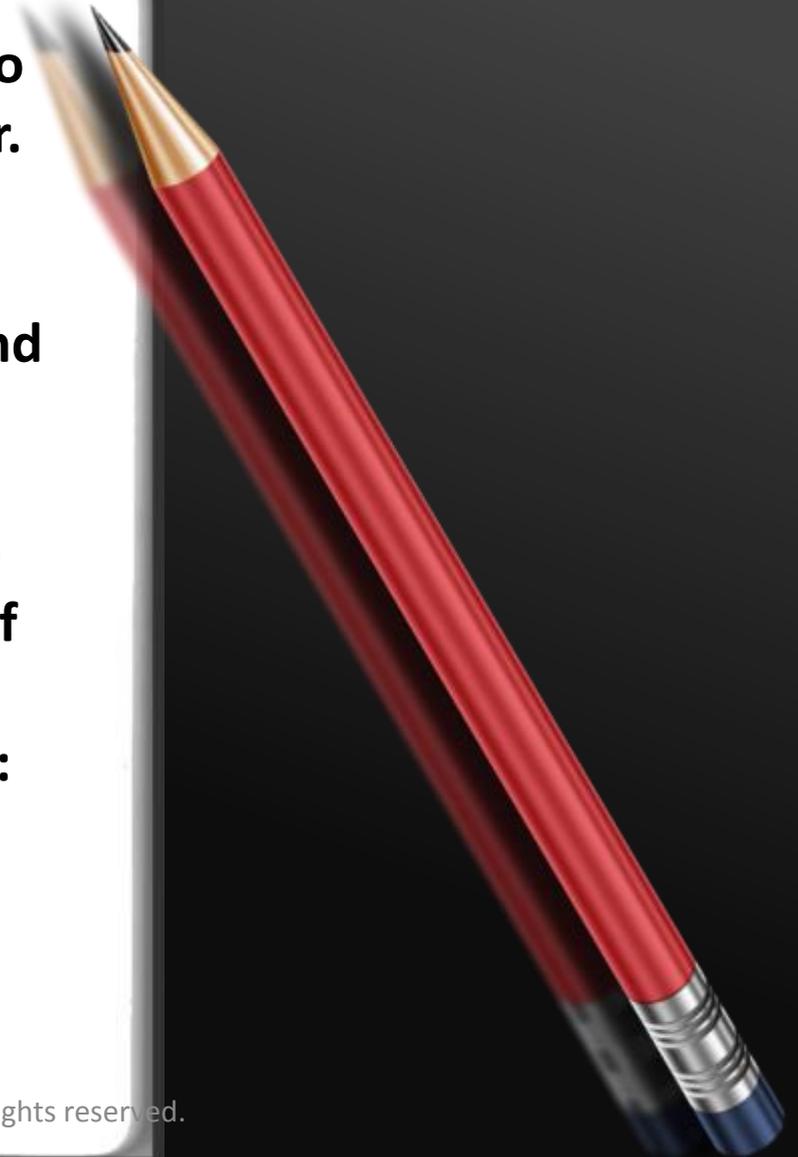


STINGER Principle

The 'STINGER' principle proves to be greatly useful to any manager. However, it necessary to supplement Stinger with other skills to match the complexity and dynamics of today's markets.

Therefore, it is recommended to use the following combination of Stinger, Data and Methods for a successful TQM implementation:

**STINGER + Data + Methods =
Management By Facts (MBF)**



Elements of Measurement of Customer Satisfaction

The following are the various elements of 'Total Quality' pertaining to the product itself, the service and the circumstances of delivery that play a key role for measuring customer satisfaction:

Delivery Time

Telephone Service

Service Staff



Handling Complaints

Sales Material

Image

Elements of Measurement of Customer Satisfaction

The following are the various elements of 'Total Quality' pertaining to the product itself, the service and the circumstances of delivery that play a key role for measuring customer satisfaction:

Keeping Agreements

Fitness to Use

Instructions for Use



Roll your mouse over the icon, to learn more.

Product Features

Advertisement

Reliability



Tip

One must always ensure the customer's satisfaction. Satisfied customers today are a condition for a satisfactory business result tomorrow. It is therefore imperative that firms establish the means to check customer satisfaction.

Continuous Improvements (Kaizen)



In 1986, Masaaki Imai's world-famous book Kaizen was released which primarily focused on the continuous improvements aspect of TQM.

In Kaizen, Imai defines quality simply as:

- Quality is 'everything which can be improved'.

The Japanese as well as Imai see a very close connection between quality and the concept of improvement.

This is also an essence on which TQM works.

Continuous Improvements (Kaizen)



TQM conveys that companies can achieve higher quality through:

- **Internal quality improvements**
- **External quality improvements**

The internal quality improvements primarily aim to make the internal processes 'learner', that is, to prevent defects and problems in the internal processes which will lead to lower costs.

Continuous Improvements (Kaizen)



On the other hand, external quality improvements are aimed at the external customer.

The aim here is to increase customer satisfaction and thereby achieve a bigger market share and with it, higher earnings.

You should bear in mind that both types of quality improvements should not be seen independently of each other in order to gain higher profits.

Everybody's Participation



TQM is process-oriented.

Also, a firm's processes include its customers both internal customers or the firm's employees and external customers.

Hence, it is crucial to identify these customers, together with their demands and anticipations in all the processes.

The next obvious step is to plan how these demands and anticipations can be satisfied.

Everybody's Participation



For this purpose, companies have to gather feedback from the customers, so that their experiences and problems are known in all processes.

Hence, the continuous improvement of both products and processes can be achieved on the basis of this feedback.

Thus, it is only natural that everybody should participate for the effective continuous improvement through working on the feedback of the customers.

MCQ

Q. Which of the following Principles of TQM stand for 'Kaizen'?

- Everybody's Participation
- Continuous Improvements
- Focus on Facts
- Management's Commitment

Click on the radio button to select the correct answer!

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Tools used in Total Quality Management

There are many techniques that will be useful in planning for quality on a project. Some of the most commonly used tools in Total Quality Management (TQM) are as follows:

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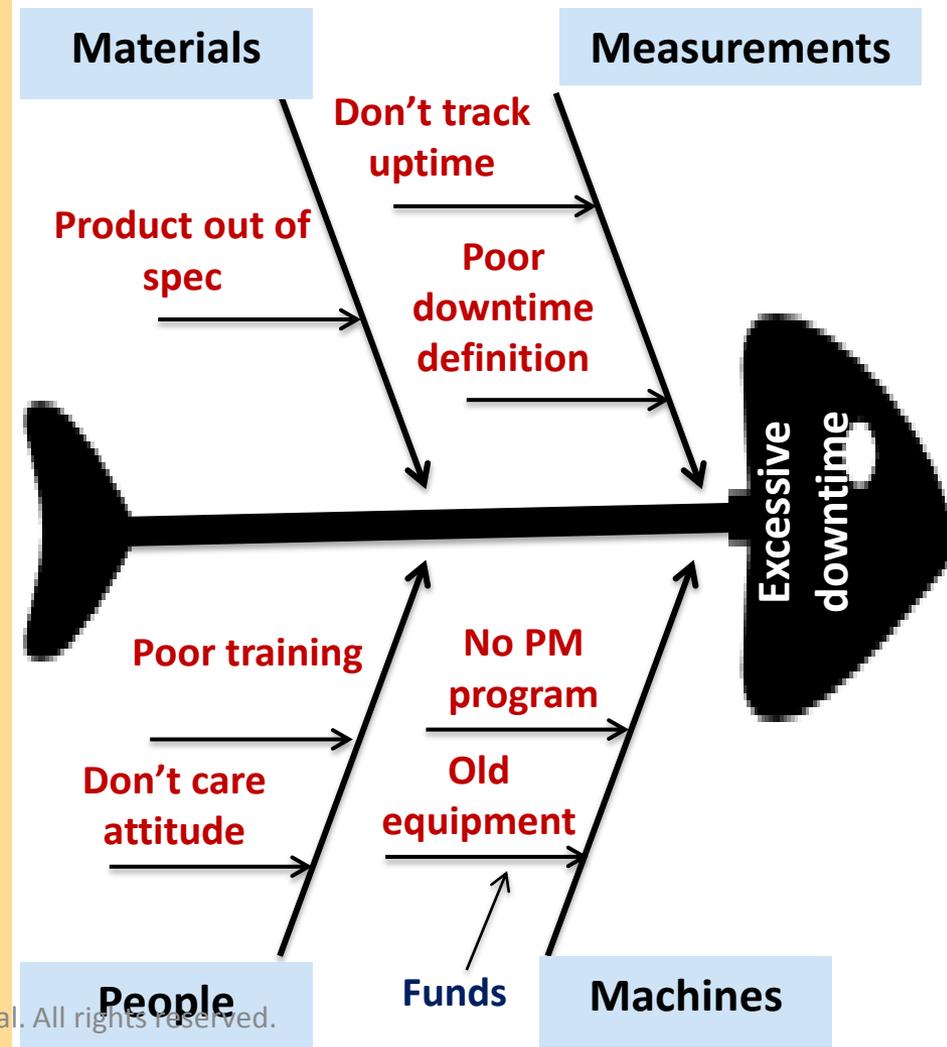
12

Cause and Effect Diagrams

1

Cause and Effect Diagrams (Fishbone or Ishikawa Diagrams):

- 'Cause and Effect Diagrams' are used to find the root cause of a defect.
- They help to stimulate thinking and organization of thoughts.
- They can be used in quality planning, as well as quality control.



Histogram

2

Histogram:

- A 'Histogram' is a graphical representation of data through a vertical bar chart showing the frequency of how often a particular variable occurred and where relative frequencies are represented by relative areas.
- Hence, the relative frequency of a certain variable is shown by a histogram's height at a specific point.



Histogram

Histogram

2



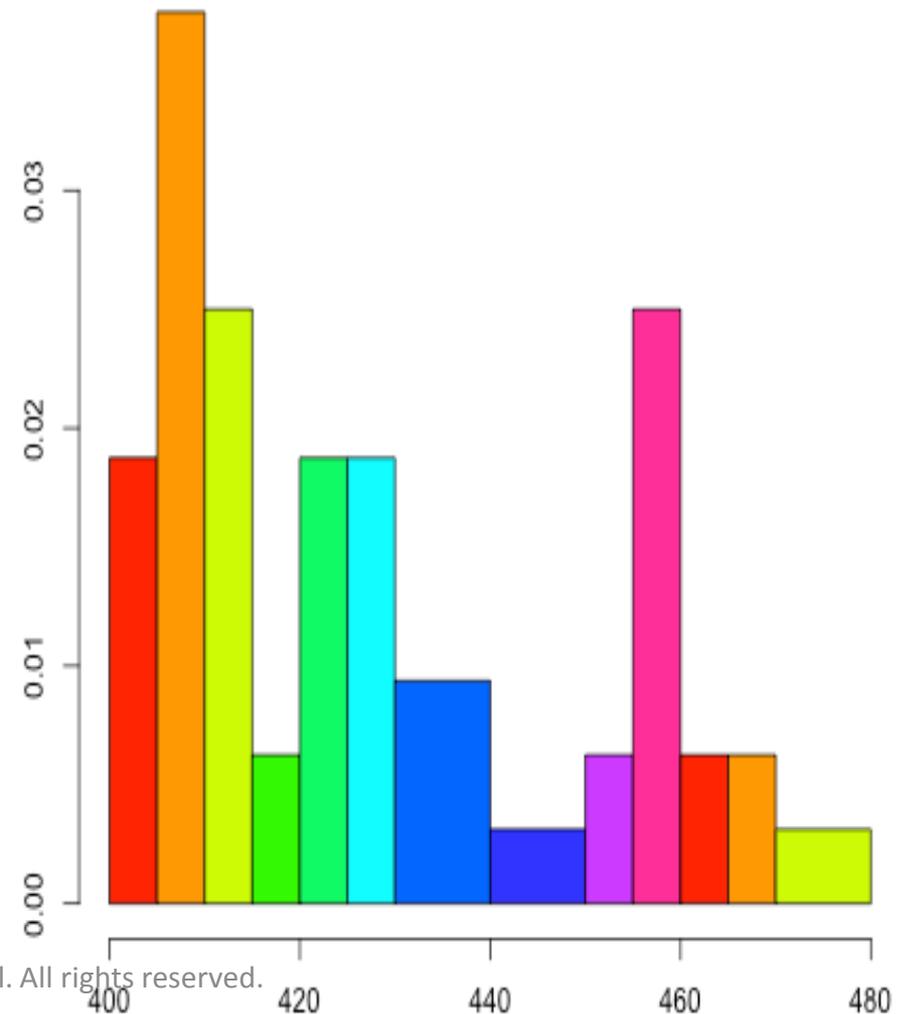
- A histogram is similar to a bar graph.
- The only difference is that in a histogram the vertical bars are adjoining to each other such that there is no space between bars.
- Histograms help in estimating the probability distribution of a continuous variable. It was introduced by Karl Pearson.

Histogram

Histogram

2

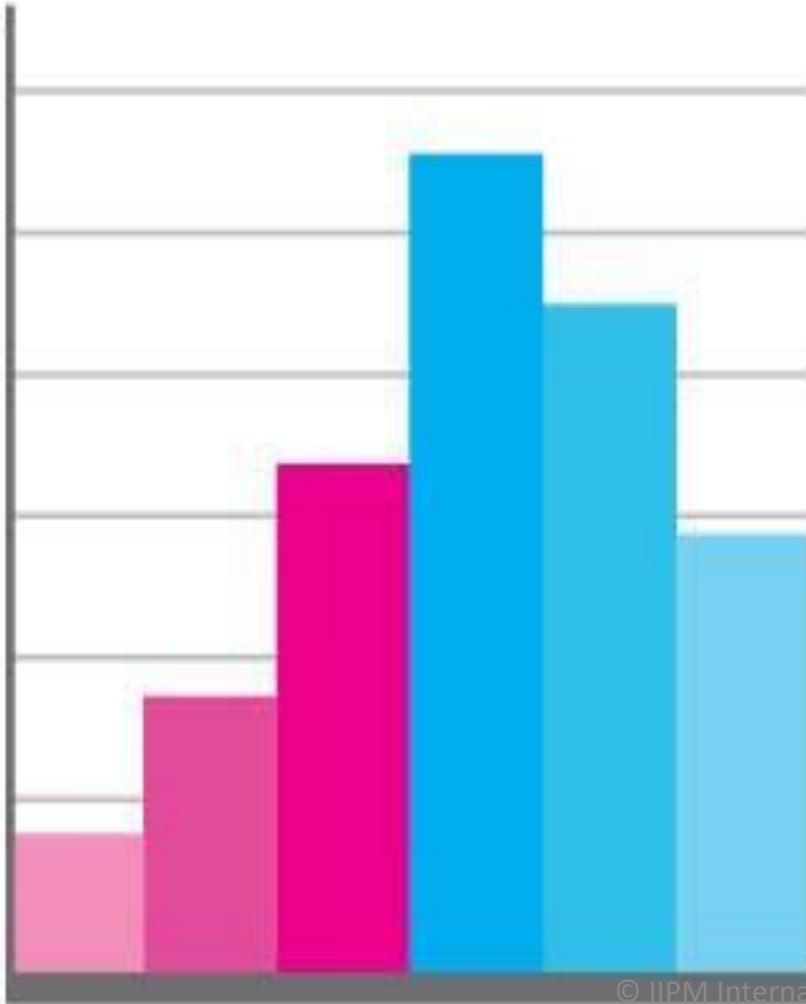
- A Histogram can be drawn by drawing adjacent rectangles or adjacent bars that are erected over discrete intervals (bins).
- The area of each rectangle is equal to the frequency of the observations in the interval.
- Moreover, the height of a rectangle is equal to the frequency density of the interval.



Histogram

Histogram

2



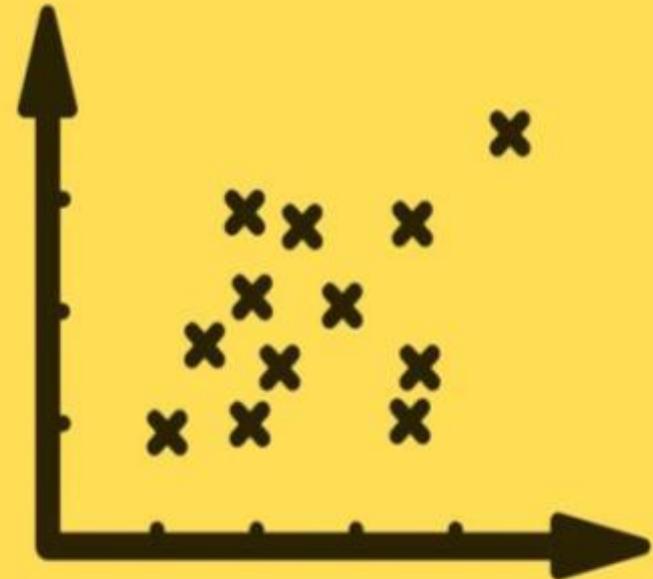
- Here, the frequency density can be defined as the frequency divided by the width of the interval.
- So, the ordinate or y-axis value is frequency per unit class interval or the relative frequency.
- The total area of the histogram is equal to the total number of data.
- It has been found that the histogram is best suited for continuous data sets.

Scatter Chart/Scatter Diagrams/Dot Plot

3

Scatter Chart/Scatter Diagrams/Dot Plot:

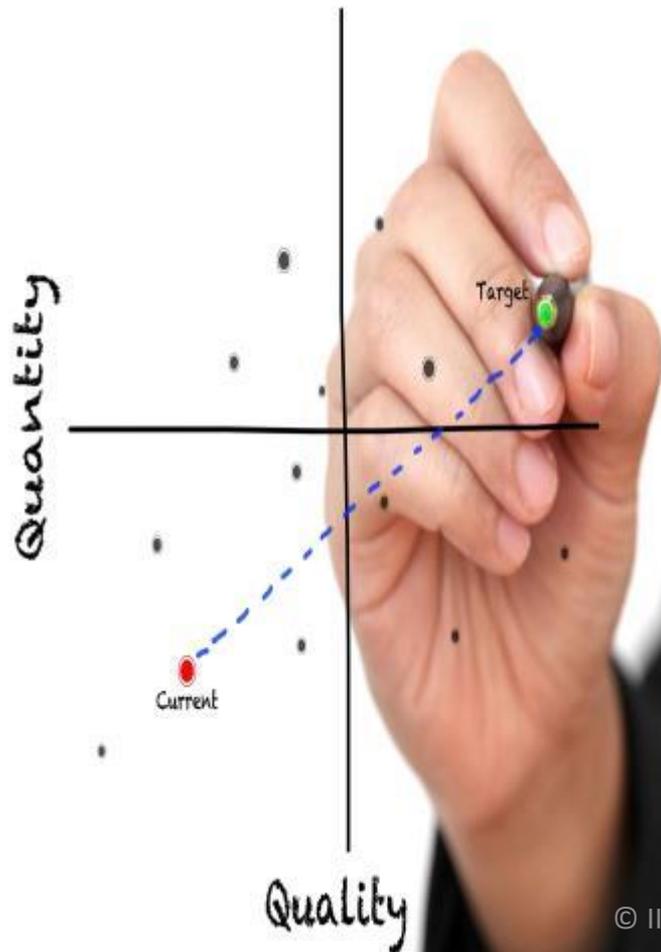
- A 'Scatter Diagram' is also known as a 'Scatter Plot', 'Scatter Chart', 'Scatter Gram', 'Scatter Graph', 'X-Y Graph' or 'Dot Plot'.
- 'Scatter Diagram' consists of a graph of points that are plotted against a horizontal and vertical axis.



Scatter Chart/Scatter Diagrams/Dot Plot

Scatter Chart/Scatter Diagrams/Dot Plot

3



- These plotted points track and show the relationship between two variables or two sets of data to see if they are correlated.
- The data on a 'Scatter Diagram' is plotted on the graph in the form of Cartesian Coordinates or (x, y) coordinates.

Scatter Chart/Scatter Diagrams/Dot Plot

Scatter Chart/Scatter Diagrams/Dot Plot

3

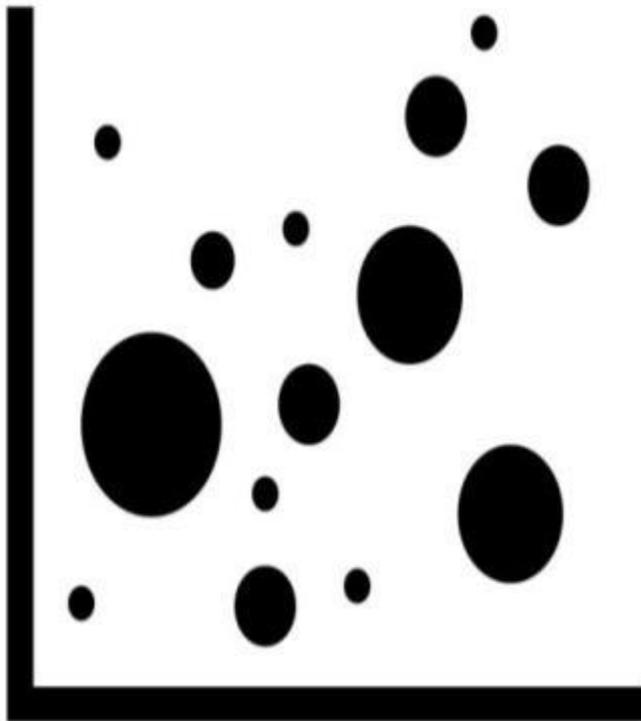
- Each of the data points is displayed using the Cartesian coordinates where the x coordinate shows the position of the variable on the horizontal or X axis and the y coordinate shows the position of the variable on the vertical or Y axis.
- Generally, the least squares method is used to include a straight line for best fit.



Scatter Chart/Scatter Diagrams/Dot Plot

Scatter Chart/Scatter Diagrams/Dot Plot

3



- ‘Scatter Plots’ are used to find the relation between two sets of data or two variables that both relate to the same ‘event’.
- Therefore, if you are able to imagine a straight line or curve that can be drawn through the data so that it "fits" as well as possible, then there is a correlation between the two data sets or two variables.

Scatter Chart/Scatter Diagrams/Dot Plot

Scatter Chart/Scatter Diagrams/Dot Plot

3

- Moreover, it can be deduced that stronger is the relationship between two variables if the points cluster more closely around the imaginary line of best fit.
- On the other hand, if you find it difficult to imagine where you would draw a line and if the points show no significant and clear clustering, there is probably no correlation between the two data sets or two variables.



Scatter Chart/Scatter Diagrams/Dot Plot

Scatter Chart/Scatter Diagrams/Dot Plot

3



- Also, there is a positive correlation between the two variables if the points cluster in a band running from lower left to upper right.
- Here, a positive correlation means that if x increases then y also increases.
- Moreover, there is a negative correlation between the two variables if the points cluster in a band running from upper left to lower right. Here, a negative correlation means that if x increases then y decreases.

Scatter Chart/Scatter Diagrams/Dot Plot

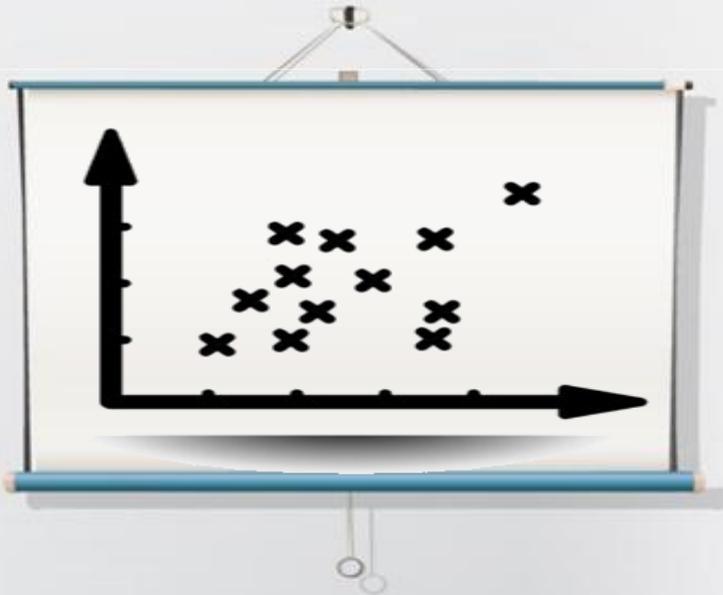
Scatter Chart/Scatter Diagrams/Dot Plot

3

- **Note:**
- It is important that you keep in mind that a scatter plot may show that a relationship exists. However, it does not and cannot prove that one variable is caused by the other. So, there are chances that a third factor may be causing both or the apparent relationship could just be a fluke. Therefore, a Scatter Plot can just give you a clue that that two things might be related, and if so, how they move together.



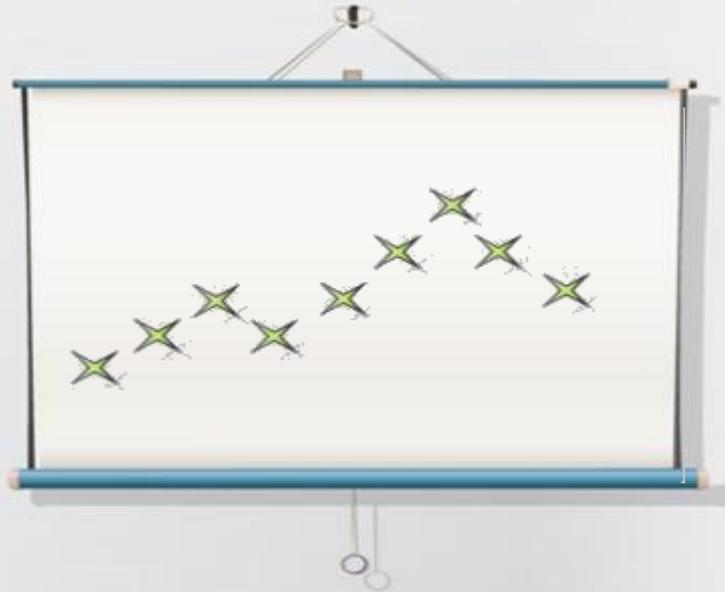
When to Use a Scatter Diagram



The following are some of the cases where you could plot a 'Scatter Plot' for data:

- In cases where you have paired numerical data
- Where the dependent variable may have multiple values for each value of the independent variable

When to Use a Scatter Diagram



- In cases where you want to determine if two variables are related
- In cases where you want to find out the potential root causes of problems
- Before constructing a control chart to test for autocorrelation

When to Use a Scatter Diagram



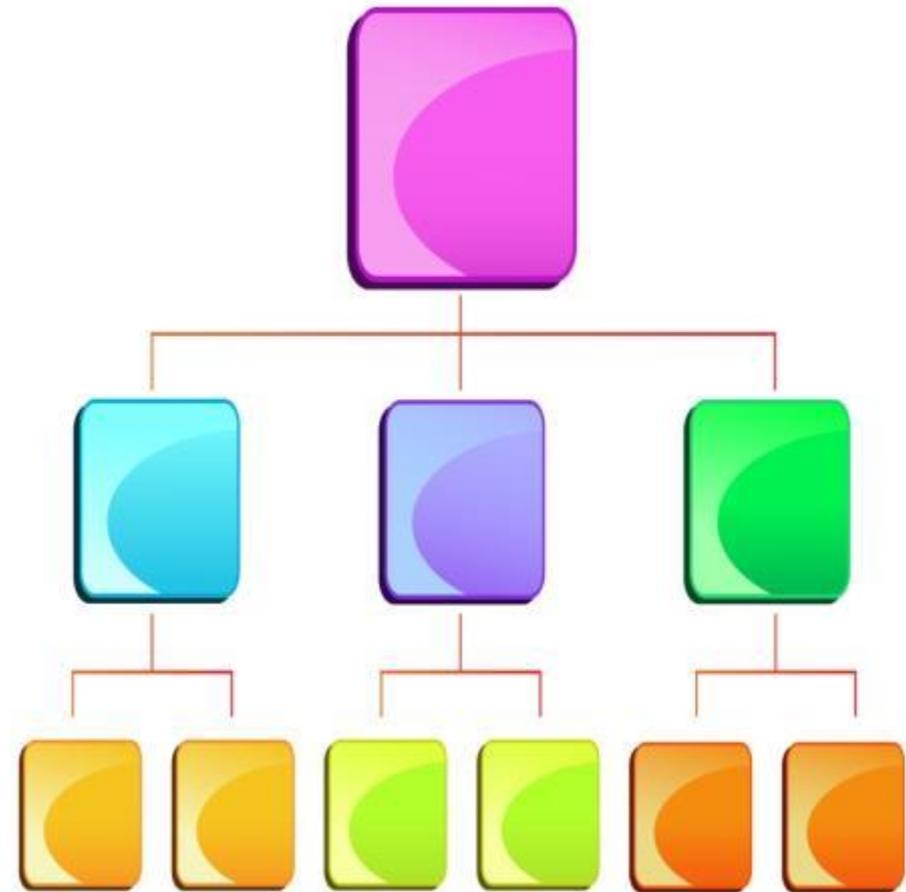
- **To determine objectively whether a particular cause and effect are related after you have a list of potential causes and effects that you got after brainstorming using a fishbone diagram**
- **To determine if two effects that appear to be related occur due to the same cause**

Flowchart

4

Flowchart:

- Flowcharting uses diagrams that depict the relationship of various elements in the process.
- A similar concept is Data Flow Diagrams, which show the flow of data in various parts of the system.
- Developing a flowchart can help you anticipate where and when a problem may occur.

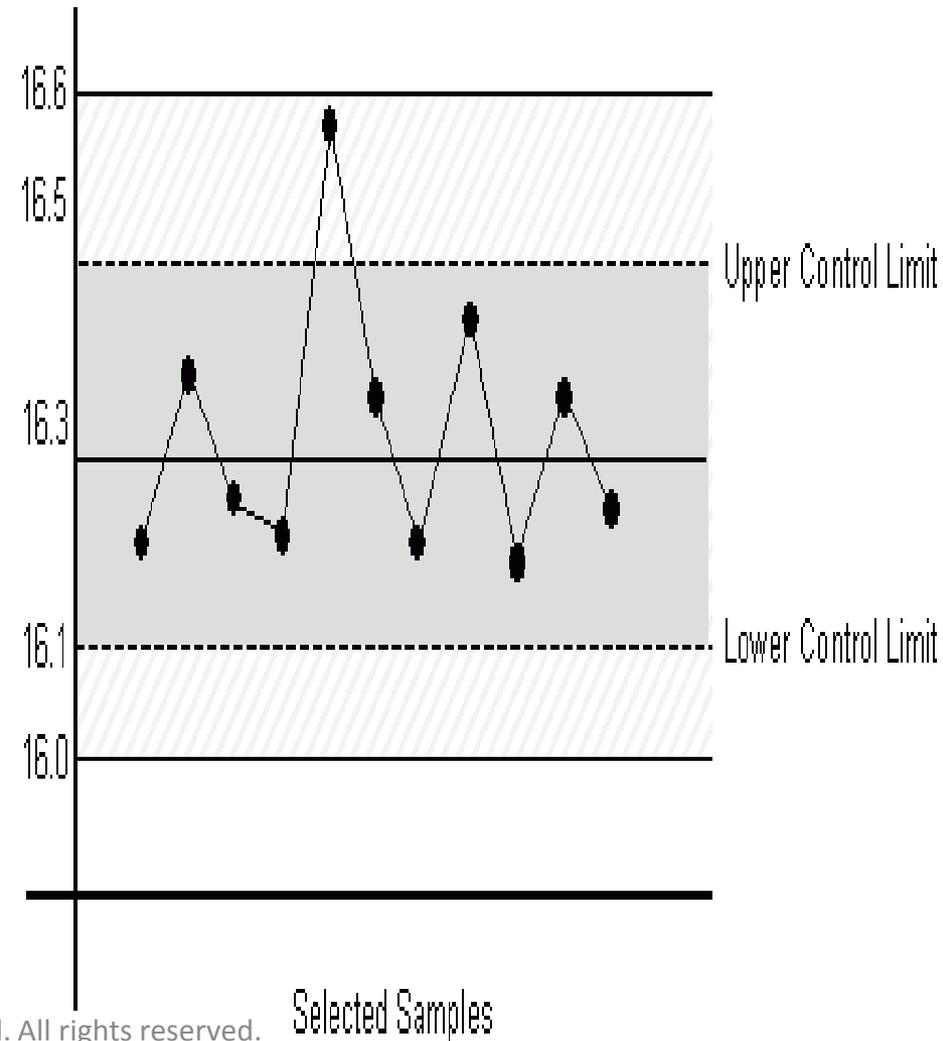


Control Charts

5

Control Charts:

- Control Charts help you to graphically determine if the process is within acceptable limits.
- A control chart can be used to monitor process performance figures such as cost or schedule variance.



Pareto Charts

6

Pareto Charts:

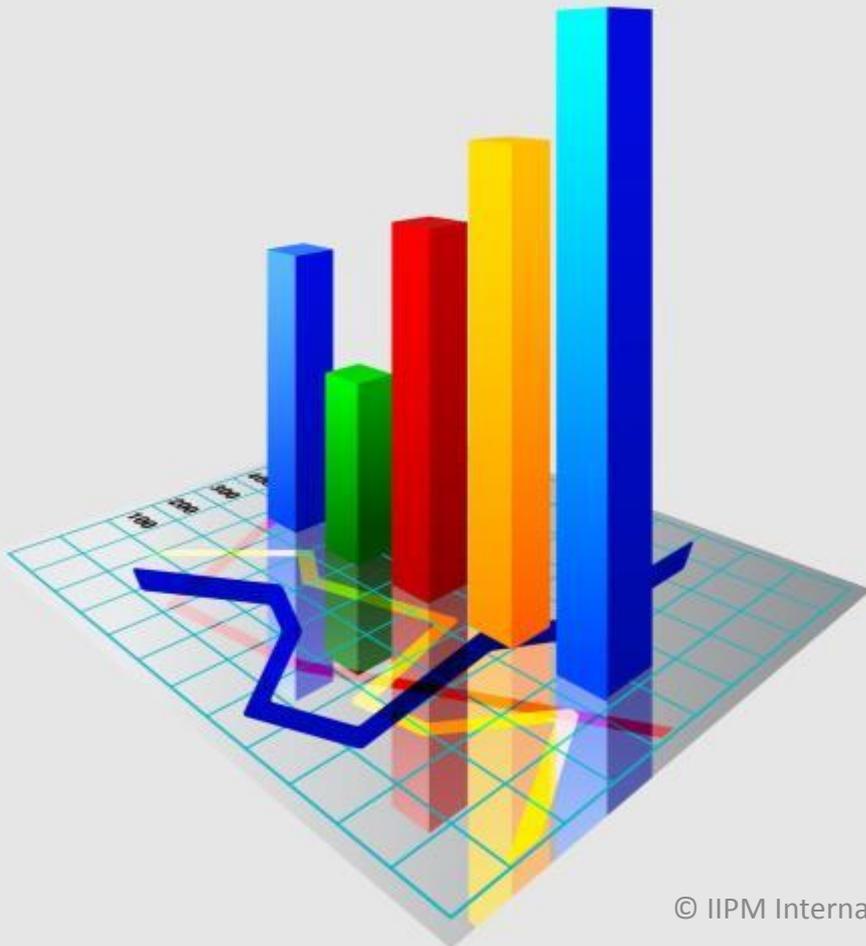
- A Pareto Chart is 'a series of bars whose heights reflect the frequency or impact of problems.
- The bars are arranged in descending order of height from left to right.
- This shows that the categories represented by the tall bars on the left are relatively more important than those on the right.



Pareto Charts

Pareto Charts

6



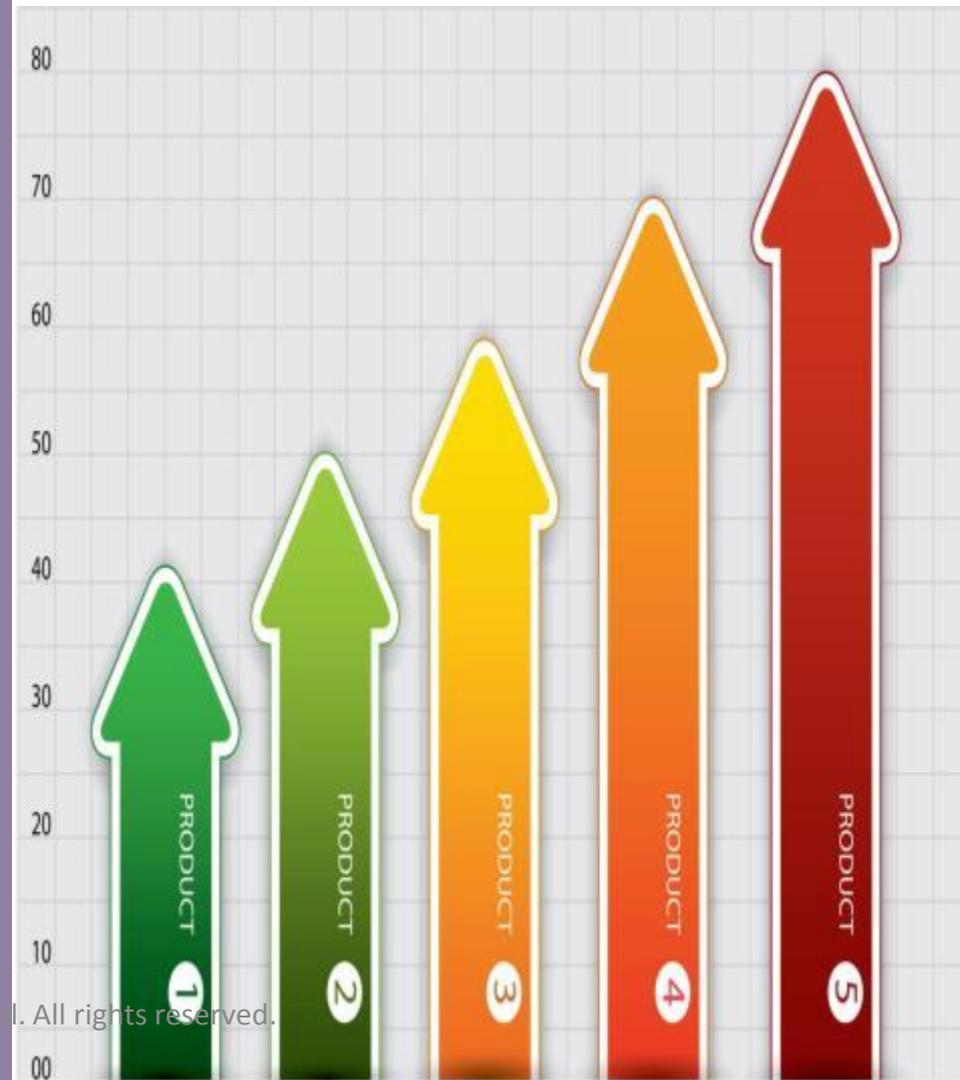
- Pareto charts are actually histograms aided by the 80/20 rule adapted by Joseph Juran and are used to identify and prioritize problems to be solved.
- Pareto Charts are used for Pareto Analysis.
- Pareto Charts help to graphically represent the errors or defects against a common background of problems.

Pareto Charts

Pareto Charts

6

- The first Pareto Chart that you create will help you identify a significant problem that is still too big to work on.
- However, a second Pareto Analysis may be necessary to break this big significant problem into workable pieces.
- You can use Pareto Charts to identify problems to work on.



Pareto Charts

Pareto Charts

6



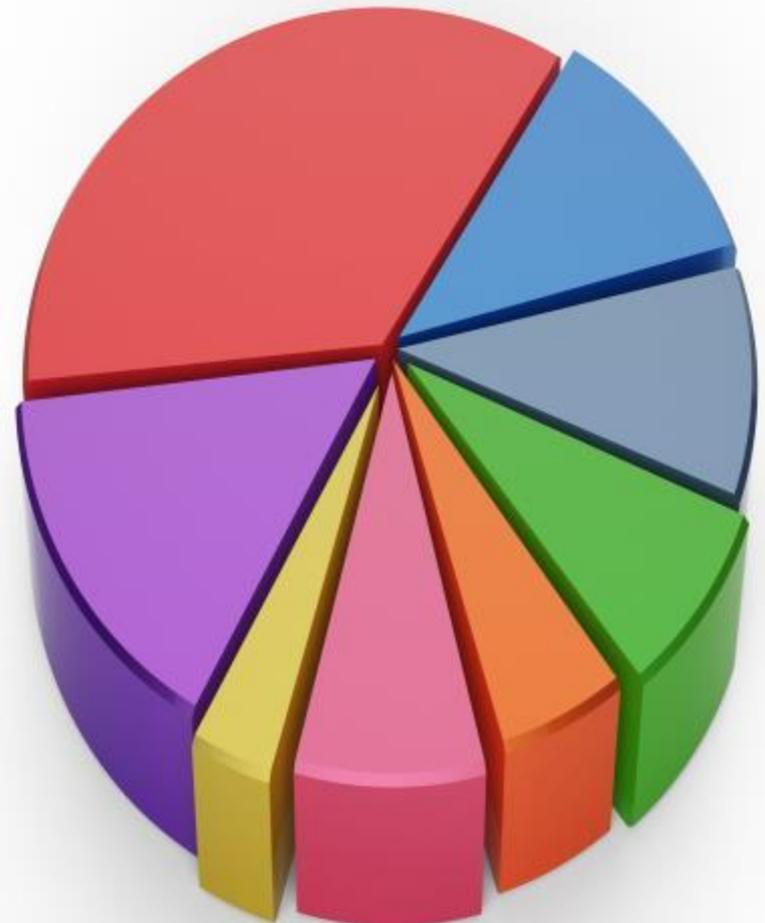
- Pareto Charts help you to increase process efficiency, conserve materials, reduce costs or increase safety.
- Pareto Charts will be most effective when the problem categories used in the charts are defined by your customer or the person that actually uses your product or service.

Pie Charts

7

Pie Charts:

- 'Pie-chart' consists of a circle or disk which is divided into pie shaped pieces or 'sectors' which are proportional to the frequencies.
- Therefore, in a pie-chart, the areas of the sectors and hence the angles of the sectors are proportional to the frequencies in the different categories.



Pie Charts

Pie Charts

7



- A pie-chart depicts and shows how a part of something relates to the whole.
- You should keep in mind to always use pie-chart for qualitative data and to avoid using a pie-chart for quantitative data.
- It is more preferable to use a bar chart or frequency polygon for quantitative data.

Bar Graphs/Bar Charts

8

Bar Graphs/Bar Charts:

- A 'Bar Graph' or 'Bar Chart' consists of a bar, either horizontal or vertical, which is used to represent counts or frequencies for several categories.
- The chart is drawn using thick lines or bars that denote the frequencies of X variables on X axis.



Bar Graphs/Bar Charts

Bar Graphs/Bar Charts

8



- One bar is used for each category. Also, the length of the bar is equal to frequency of the category.
- Therefore, it consists of rectangular bars that differ in height or length according to their value or frequency.
- There are two main types of bar graphs: horizontal and vertical.
- A 'Bar Graph' or 'Bar Chart' is almost similar to a histogram.

Bar Graphs/Bar Charts

Bar Graphs/Bar Charts

8

- However, in a 'Bar Graph' or 'Bar Chart', the 'bars' or rectangles are not connected to each other whereas in the histogram the 'bars' are connected rectangles.
- A 'Bar Graph' or 'Bar Chart' is most commonly used for presenting and comparing data as it is easy to understand.
- Bar Graphs are mostly used to present data that are discrete and the frequencies refer to individual values.



Frequency Polygons

9

Frequency Polygons:

- A 'Frequency Polygon' is drawn by marking the tops of the bars in a bar graph and then joining these points by straight lines.
- Hence, to draw a 'Frequency Polygon', a 'Bar Graph' has to be drawn first and then the tops of the bars are connected by a straight line as shown in the given image.



Frequency Polygons

Frequency Polygons

9



- Hence, just like bar graphs, the frequency polygons are mostly used to present data that are discrete and the frequencies refer to individual values.
- ‘Frequency Polygons’ are most suitable for comparing two or more sets of data.

Line Graph

10

Line Graph:

- A 'Line Graph' consists of a line that is drawn between two axes – X and Y and which shows information that is connected in some way such as change over time.
- Hence, a line graph clearly shows the trends in data.
- A line graph would show you the plot of data which are collected over a period of time.



Line Graph

Line Graph

10



- Hence, the line graph can clearly denote and show how the data changes at regular intervals.
- Due to this reason, a line graph is mostly used for comparing two variables.
- A line graph consists of a vertical 'Y' axis and a horizontal 'X' axis. Each variable is plotted along an axis such as time is plotted on the X-axis and the other variable is plotted on the Y-axis.

Line Graph

Line Graph

10

- Line graphs are greatly suited for showing specific values of data.
- This is because if any one variable is given or known, then the other can easily be determined using a line graph.



Line Graph

Line Graph

10



- Also, a line graph accurately shows how one variable is affected by the other as it increases or decreases.
- This helps to show trends in data clearly.
- Also, a line graph helps to predict results of data that have not yet been recorded.

Ogive:

- An 'Ogive' is a chart that shows the data on a cumulative basis.
- Hence, 'Ogives' are nothing but 'Cumulative Histograms'. Ogives are a useful graph to find how many data values lie above or below a particular value in a data set.





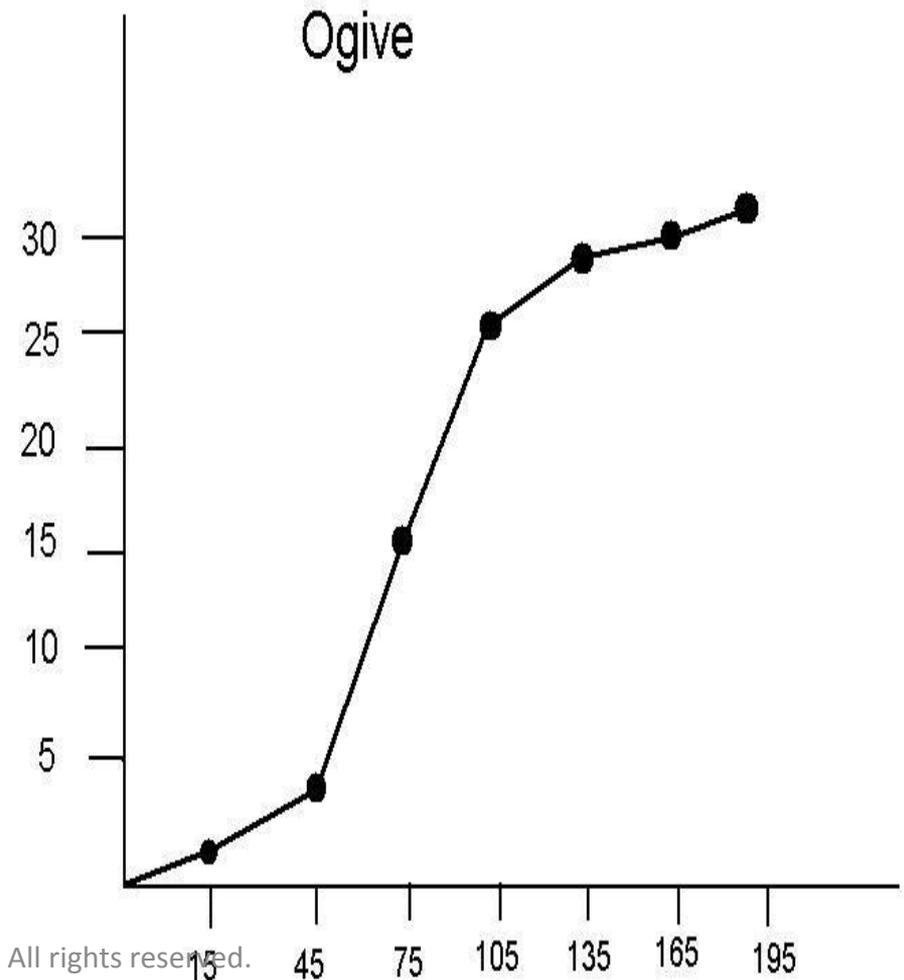
- The data in an 'Ogive' is shown in the form of a single line, so, it is a cumulative live graph.
- Greater or lesser increases are indicated by the relative slopes from point to point.
- Ogive can be drawn from left to right or from right to left.
- Ogives are best suited when you want to display the total at any given time.

Ogive

Ogive

11

- So, an 'Ogive' can help to keep track of total and individual values that are periodically combined.
- So, an ogive displays a running total.
- However, it is not an ideal graph for showing comparisons between categories because it simply combines the values in each category.

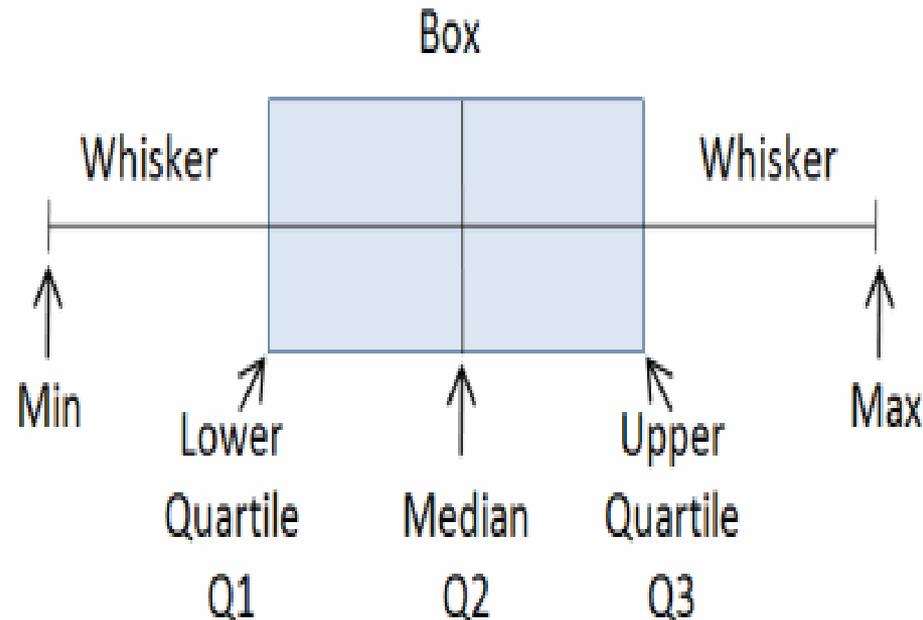


Box-and-whisker Plots/Box Plots

12

Box-and-whisker Plots/Box Plots:

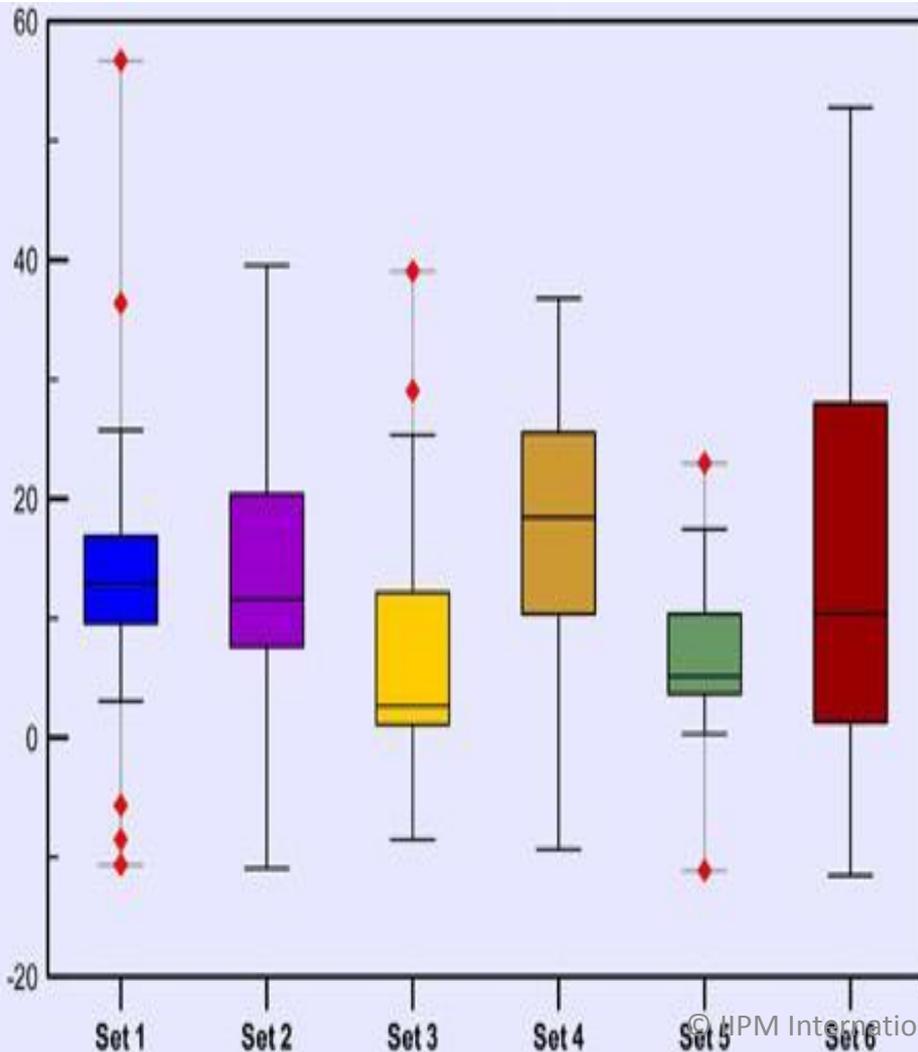
- 'Box-and-whisker Plots' are also known as the 'Box Plots'.
- 'Box-and-whisker Plots' prove to be greatly useful in graphically presenting a description of the main features of a set of observations or data.
- There are many different ways in which you can plot the 'Box-and-whisker Plots' or 'Box Plots'.



Box-and-whisker Plots/Box Plots

Box-and-whisker Plots/Box Plots

12



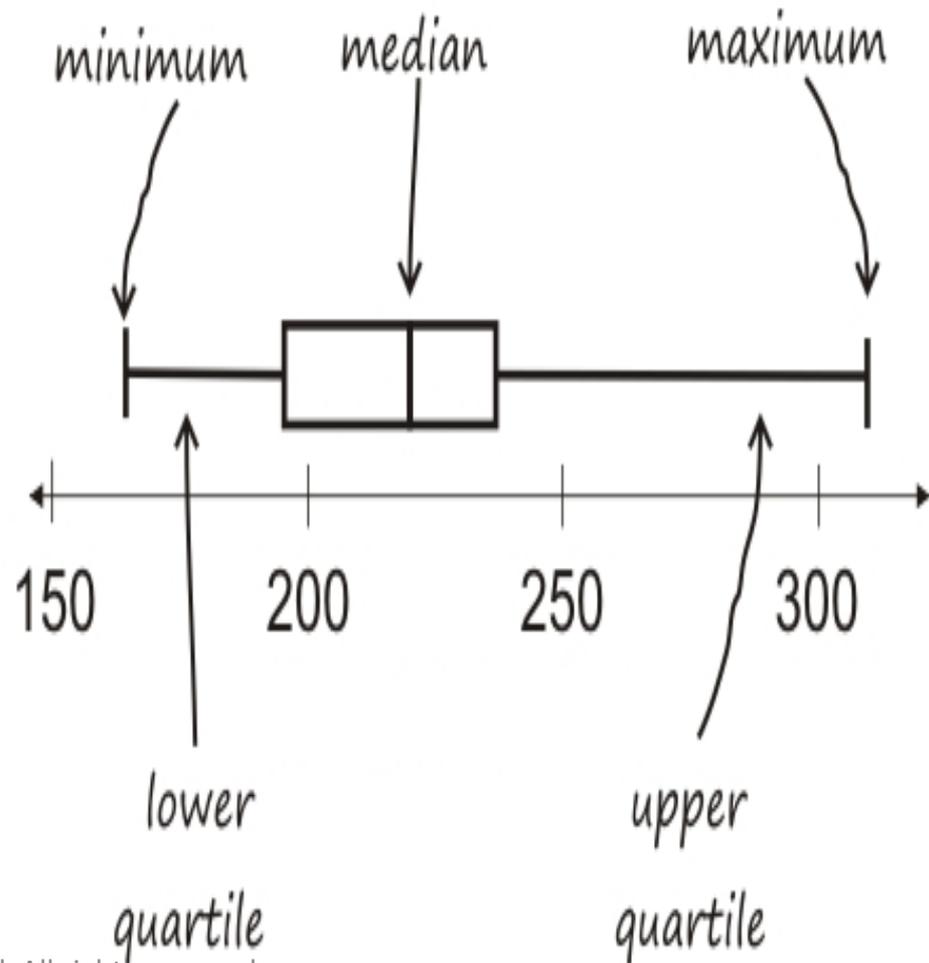
- The simplest way to draw a 'Box-and-whisker Plot' is by drawing a rectangular box.
- This rectangular box stretches from the lower quartile to the upper quartile.
- The rectangular box is divided in two at the median.

Box-and-whisker Plots/Box Plots

Box-and-whisker Plots/Box Plots

12

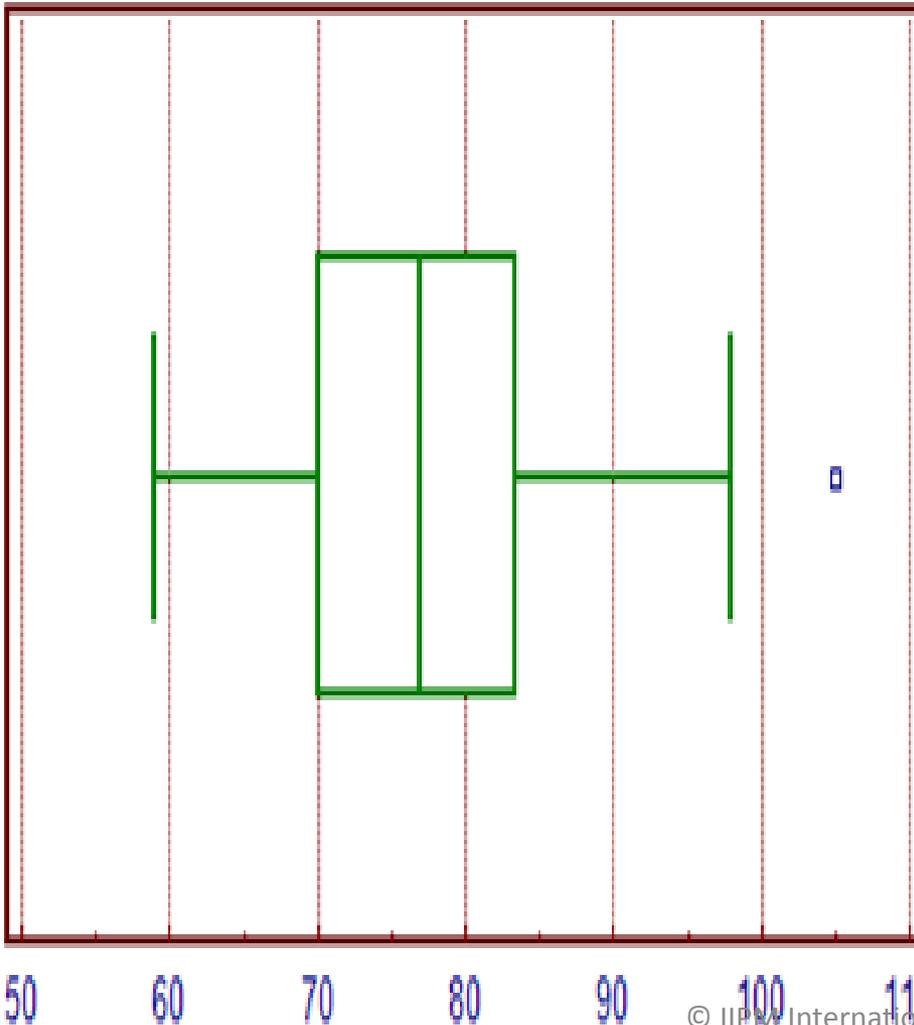
- A line is drawn from each end of the box, to the maximum and minimum observations.
- These lines are usually known as 'whiskers'.
- The greatest advantage of using the 'Box-and-whisker Plots' is that it is highly suitable for comparing several groups of observations.



Box-and-whisker Plots/Box Plots

Box-and-whisker Plots/Box Plots

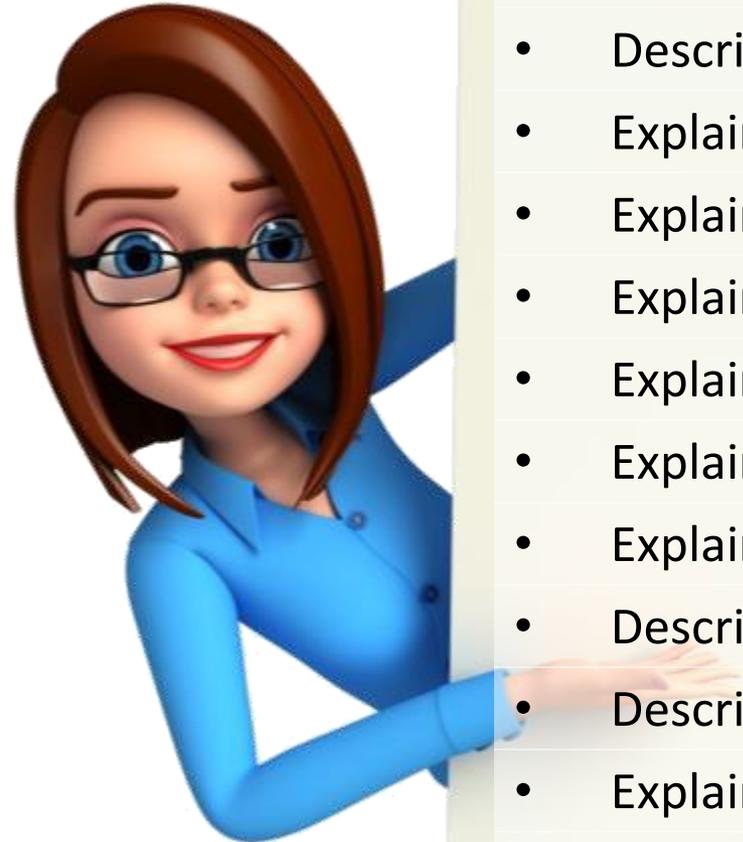
12



- A box plot is constructed for each group.
- These box plots are displayed on a common scale.
- It has been found that to make a meaningful comparison between two groups of observations, it is crucial that at least 10 observations per group are available.

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Focus Areas of TQM

1

Total Quality Management (TQM) transforms the way a company thinks and works on major business issues:

2

3

4

5

6

7

8

9

10

Let us look at each in detail.

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Process Design

Total Quality Management (TQM) transforms the way a
business approaches business issues:

1

Process Design

6

2

- **Process Design:**

7

3

- Designing production processes to have the best and most consistent outcomes from the beginning.

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Pro-activeness

1

Total Quality Management (TQM) transforms the way a company thinks and works on major business issues:

2

Pro-activeness

3

- **Pro-activeness:**
 - Encouraging people to be pro-active about preventing potential problems instead of waiting for problems to occur.

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Analysis and Reasoning

1

Total Quality Management (TQM) transforms the way a company thinks and works on major business issues:

2

3

Analysis and Reasoning

4

- **Analysis and Reasoning:**
 - Using facts and data to find the root causes of variations, instead of educated guesses or intuition.

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Focus on Process Improvement

1

Total Quality Management (TQM) transforms the way a company thinks and works on major business issues:

2

- **Focus on Process Improvement:**
 - Focusing on process improvement as a key to excellence in quality.

3

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Focus on Process Improvement

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Variable Investigation

1

Total Quality Management (TQM) transforms the way a company thinks and works on major business issues:

2

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Variable Investigation

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- **Variable Investigation:**
 - Conducting studies to identify what are the variables that cause variation and how they interact with each other.

Data-based Decision Making

1

Total Quality Management (TQM) is a way a company thinks and

Data-based Decision Making

6

2

- **Data-based Decision Making:**
 - Decisions are made based on critical analysis of facts and data. by smoothly applying the TQM principles, the decision makers are more likely to have the data they need in order to make well informed decisions.

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Broad Participation in Problem Solving

1

Total Quality Management (TQM) transforms the way a company thinks and works on major business issues:

6

2

Broad Participation in Problem Solving

7

3

- **Broad Participation in Problem Solving:**

8

4

- Getting more people involved in finding causes and solutions for problems.

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Knowledge Sharing

1

Total Quality Management (TQM) transforms the way a company thinks and works on major business issues:

2

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Knowledge Sharing

- **Knowledge Sharing:**
 - Learning and sharing new knowledge in terms of best practices to speed up overall improvement.

Goal Setting

1

Total Quality Management (TQM) transforms the way a company thinks and works on major business issues:

2

- **Goal Setting:**

- Aiming at stretch goals, instead of “good enough” targets, so that the company is constantly striving for improvement.

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Goal Setting

Suppliers

1

Total Quality Management (TQM) transforms the way a company thinks and works on major business issues:

2

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- **Suppliers:**
 - Cost is not the only criteria for vendor evaluation, but relative capability to consistently provide quality materials with the shortest lead time.

Suppliers

Real Life Example

Let us now look at a real life example to understand the merit of TQM in practice.

Real Life Example



AtlantiCare
Taking You Well Into The Future

AtlantiCare is a New Jersey-based healthcare provider.

It has a workforce of about 5,000 employees spread and they operate from across 25 locations.

AtlantiCare had boasted of a good turnaround for almost two decades.

Real Life Example

However, the managers still wanted to enforce implements across the board in order to increase the margin further.

In the healthcare industry, patient satisfaction is the single-most important aspect of the business.



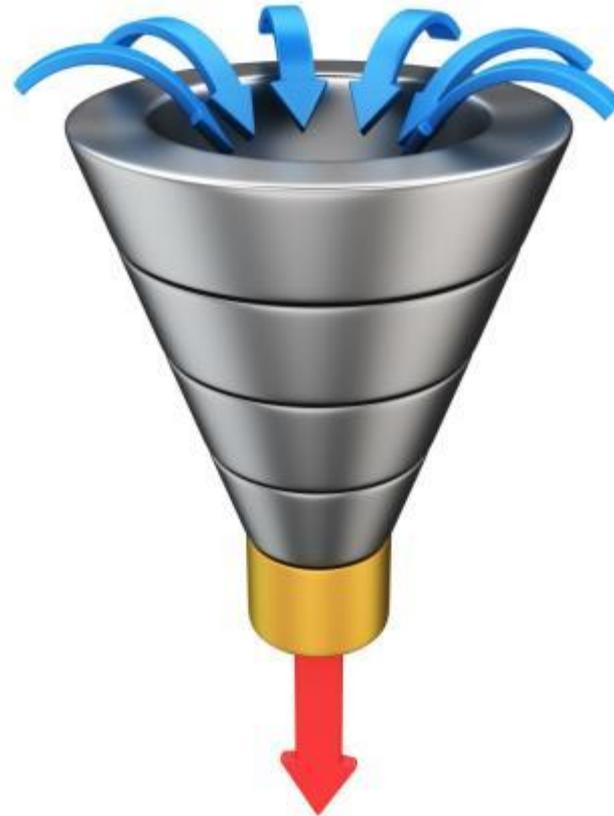
Real Life Example



Managers turned to enforce a renewed campaign of TQM. The organization decided to follow a 'plan-do-check-act' cycle. This cycle was meant to reveal any disruptions or gaps in staff communication. It was these gaps in staff communication that ultimately was leading to longer patient waiting times and more complaints.

Real Life Example

Hence, the managers decided to implement a system of sideways method of internal communications. This sideways communication meant that rather than the information trickling down from top-to-bottom, all the employees of the company were given freedom to provide crucial feedback at each and every level.



Real Life Example



AtlantiCare also made sure that all new employees understood this quality culture right from the start.

The company also implemented various training programs in the firm to ensure that all employees are aware of and understand the quality processes being followed at AtlantiCare.

Real Life Example

So, there are training programs designed to explain the company's outstanding performance model. This model organizes the company's processes into five key areas:

Quality

Growth

People and Workplace

Financial Performance

Customer Service

Real Life Example

AtlantiCare creates benchmark goals for every employee at all levels. Some of the goals that have been set include including better participation at the point of delivery, increasing clinical communication and identifying and prioritizing opportunities of service.



Real Life Example

AtlantiCare proves the merit of TQM in practical situations. Implementing the quality improvement strategies of TQM has helped AtlantiCare achieve many important milestones such as:

It tripled the number of repeat customers

It helped achieve a six-year high market share

It increased its profits enormously

The revenues rose from \$280m to \$650m

The number of patients being serviced beat all of the state numbers

Forms of Process Waste

There are various forms of waste that can be reduced to improve the quality of any process. The various forms of waste are as follows:

Waste of Correction

Waste of Overproduction

Waste of Processing

Waste of Conveyance (or Transport)

Waste of Inventory

Waste of Motion

Waste of Waiting

Let's look at each in detail. © IIPM International. All rights reserved.

Waste of Correction

Waste of Correction

Waste of Overproduction

Waste of Processing

Waste of Conveyance

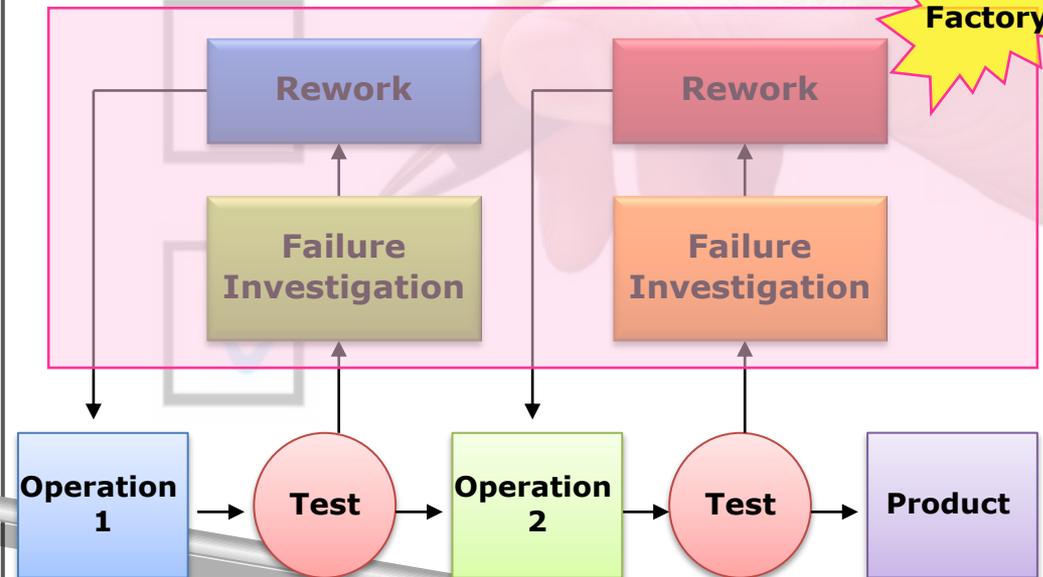
Waste of Inventory

Waste of Motion

Waste of Waiting

Waste of Correction as repairing a defect wastes time and resources. It is like work in a Hidden factory as shown below in image.

Repairing a defect wastes time and resources (Hidden factory)



Waste of Overproduction

Waste of Correction

Waste of Overproduction

Waste of Processing

Waste of Conveyance

Waste of Inventory

Waste of Motion

Waste of Waiting

Waste of Overproduction arises due to producing more than necessary or producing at faster rate than required.

Examples:

Excess labor, space, money, handling

Waste of Processing

Waste of Correction

Waste of Overproduction

Waste of Processing

Waste of Conveyance

Waste of Inventory

Waste of Motion

Waste of Waiting

Waste of Processing is caused due to processing that does not provide value to the product.

Examples:

- Excess level of approvals
- Typing memos that could be handwritten
- Cosmetic painting on internals of equipment
- Paint thickness more than specific values

Waste of Conveyance (or Transport)

Waste of Correction

Waste of Overproduction

Waste of Processing

Waste of Conveyance

Waste of Inventory

Waste of Motion

Waste of Waiting

Waste of Conveyance is caused due to unnecessary movement of material from one place to other. This should be minimized because:

- It adds to process time
- Goods might get damaged
- Material and information should be conveyed **ONLY** when and where it is needed

Waste of Inventory

Waste of Correction

Waste of Overproduction

Waste of Processing

Waste of Conveyance

Waste of Inventory

Waste of Motion

Waste of Waiting

Waste of Inventory is caused as any excess inventory is a drain on an organization.

Waste of Inventory is harmful because:

- It impacts on cash flow
- It causes increased overheads
- It impacts on quality and process issues

Examples:

Spares, brochures, stationary etc.

Waste of Motion

Waste of Correction

Waste of Overproduction

Waste of Processing

Waste of Conveyance

Waste of Inventory

Waste of Motion

Waste of Waiting

Waste of Motion is due to any movement of people, equipment, information that does not contribute value to product or service.

Waste of Waiting

Waste of Correction

Waste of Overproduction

Waste of Processing

Waste of Conveyance

Waste of Inventory

Waste of Motion

Waste of Waiting

Waste of Waiting is the idle time between operations.

It may be caused due to a period of inactivity in a downstream process because an upstream activity does not deliver on time.

Downstream resources are then often used in activities that do not add value, or worst may result in overproduction.

Some more Sources of Waste



Waste of untapped human potential:

Not using creative brainpower of employees

Waste of inappropriate systems:

Automating processes that should be removed, extensive record keeping, approvals etc.

Wasted energy and water:

Not using resources such as water, electricity, coal etc. in an efficient manner

There may also be some other sources of waste that hamper the processes in an organization.

Some such other sources of waste are shown above:

plan

Some more Sources of Waste



Wasted materials:

Conserving material through lifecycle - during design, fabrication, manufacturing

Waste of customer time:

Internal customers

Waste of defecting customers:

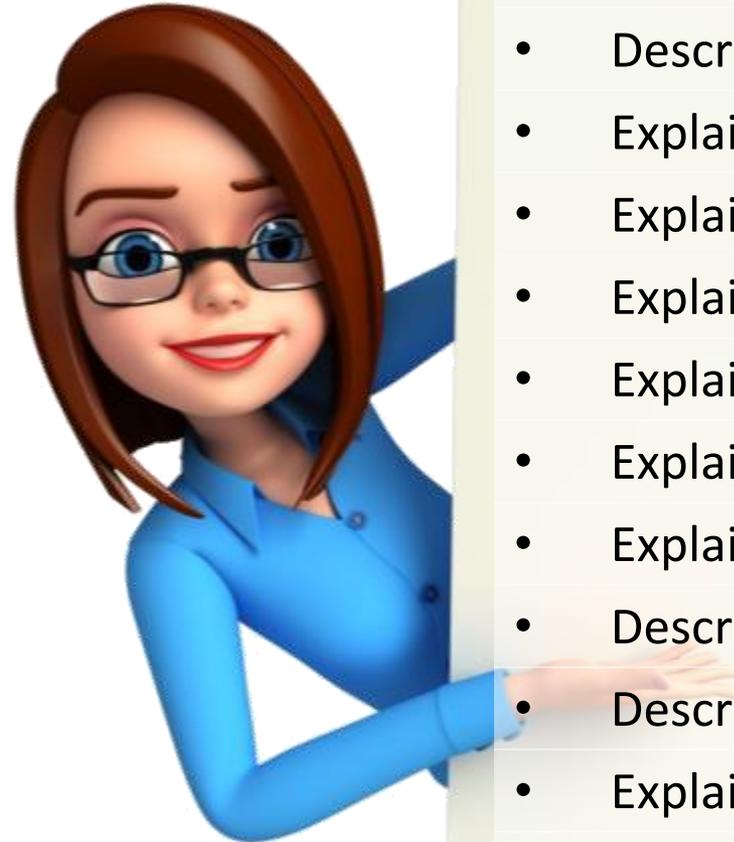
“It costs 5 times more to acquire a customer as it does to retain one”

There may also be some other sources of waste that hamper the processes in an organization.

Some such other sources of waste are shown above:

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Steps for the Quality Improvement Process

Deming and Juran believed in understanding of total quality management through the use of statistical process control. However, Crosby (1982) on the other hand was not too eager in using statistical methods related to quality. The following are the 14 steps proposed by Crosby for the process of quality improvement:

Zero Defects: This step involves analyzing the various activities that must be conducted in preparation for formally establishing zero-defects day.

Quality Improvement Team: This step mandates the requirement of a 'quality improvement team' to run the quality improvement process.

Corrective Action: This step involves having a systematic method for permanently solving the problems that are identified through the previous action steps.

Quality councils: This step involves bringing together concerned people to share quality management information on a regular basis.

Steps for the Quality Improvement Process

Measurement: This step involves measurement of the product characteristics and features to get an idea about the current and potential non-conformance problems in a manner that permits objective.

Cost of Quality: This step involves defining the relation between quality and cost to define elements that make up the cost of quality (COQ). This should then be used as a management tool.

Quality Awareness: This step involves using methods to increase awareness and personal concern among employees toward the conformance of the product or service and the quality reputation of the company.

Management Commitment: This step of management commitment ensures and clarifies the level of commitment that the management has towards quality to give a clear idea about where management stands on quality.

Employee Education: This step involves defining the type of training that all employees would need in order to proactively carry out their role in the quality improvement process.

Steps for the Quality Improvement Process

Planning and Zero-defects Day: This step involves planning for and creating a special event highlighting a 'zero-defects day' that will help the employees to realize through a personal experience, that there has been a change.

Goal Setting: This step involves encouraging individual employees to establish improvement goals for themselves and their groups so as to turn promises and commitments into action.

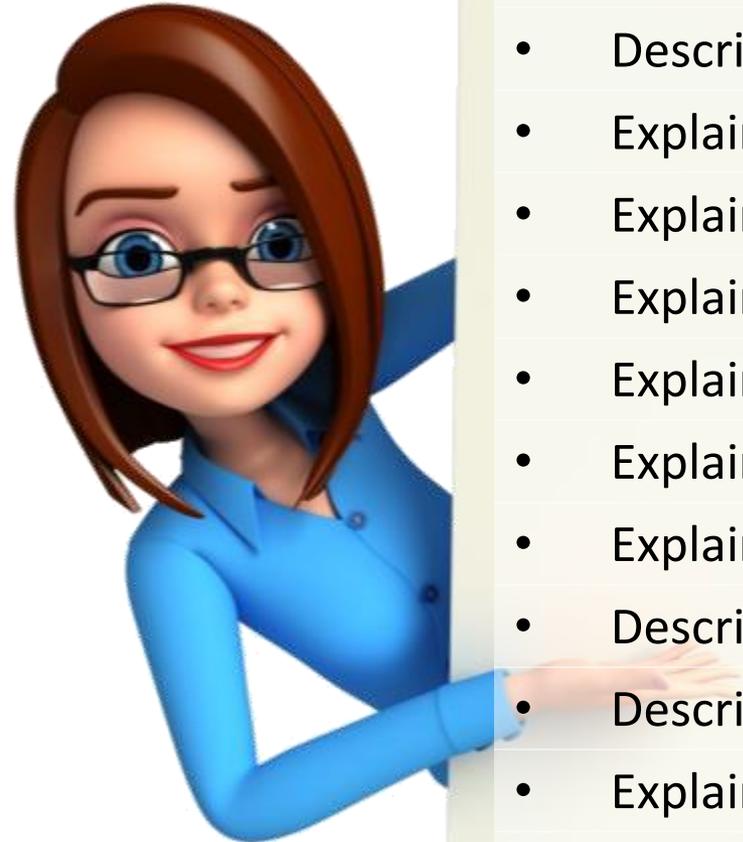
Error-cause Removal: This step involves having a method in place to help individuals to communicate to the management any situations that make it difficult for them to meet the pledge.

Recognition: This step involves appreciating those individuals who participate actively and contribute whole-heartedly to the quality improvement process.

Do it all over again: This step involves stressing upon the fact that quality improvement process is a continuous process.

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Four Absolutes of Quality Improvement Process

Crosby did not believe in the use of statistics with respect to quality. He believed that quality is conformance to requirement and can only be measured by the cost of non-conformance. Crosby proposed four absolutes for the quality improvement process. His four absolutes are:



**Definition of
Quality –
conformance to
requirements**

**Quality System
– prevention**

**Quality
Standard –
zero defects**

**Measurement
of Quality –
price of non-
conformance**

TIP

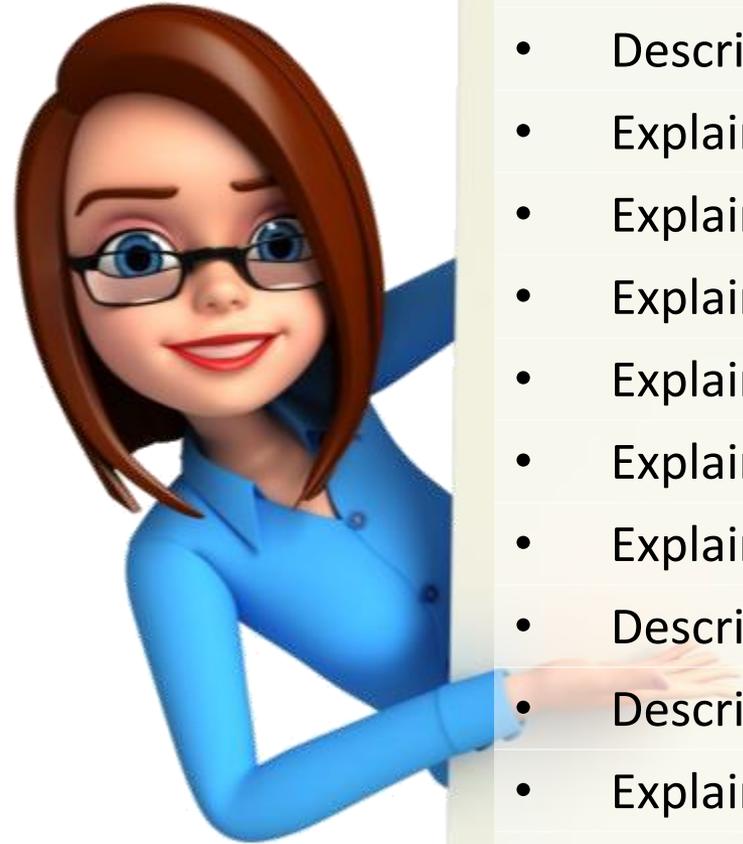
Roll your mouse over
the icon, to learn
more.

Tip

If a company wants to survive in the longer term, improved internal quality must be accompanied by improved external quality.

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Implementation of TQM

The implementation of TQM is a complex task that requires a planned, practical and well-thought-through approach. Sink has suggested the following approach to the design, development and implementation of TQM:

Stage 0: Understand the organizational system

Stage 1: Develop a strategic plan for the TQM effort

Stage 2: Plan all assumptions

Stage 3: Specify strategic objectives

Stage 4: Specify tactical objectives

Stage 5: Implementation planning

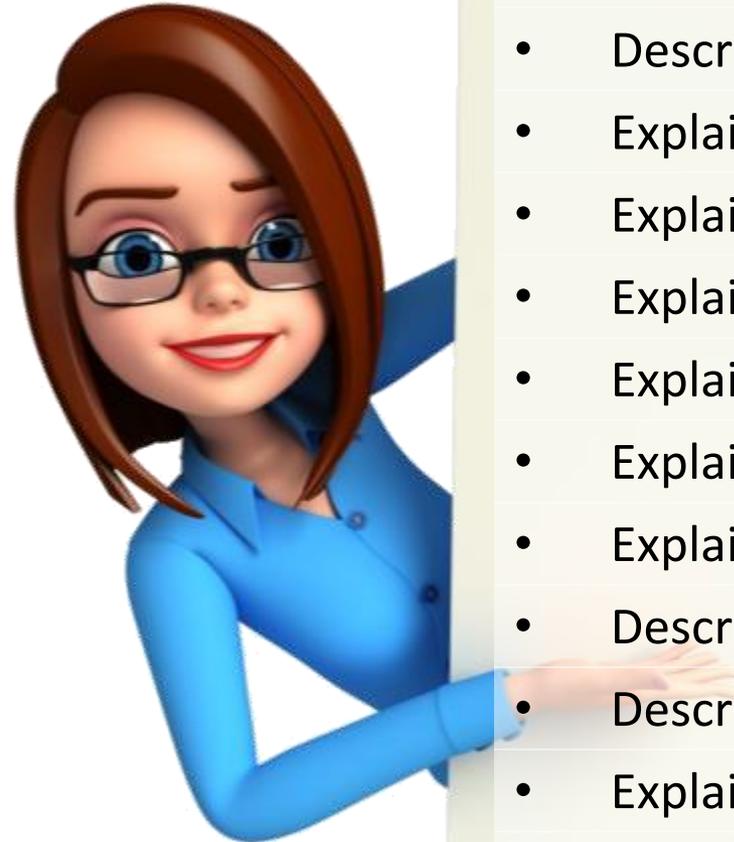
Stage 6: Project management

Stage 7: Measurement and evaluation

**Stage 8: Evaluation, accountability, follow through,
ensuring effective implementation**

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Deming's 14 Points to Improve Quality

The following are Deming's 14 points that point out the most crucial roadblocks to be overcome and conditions to be established in order to improve quality at lower costs:

Allow pride of workmanship: Get rid of the roadblocks that take away the right to pride of workmanship from hourly workers and people in management.

Drive away fear: Drive away fear among people throughout the organization by encouraging effective two-way communication and other means.

Adopt the new philosophy: Adopt the new philosophy that has been created in Japan as we are in a new economic age.

Commitment of Top management: Distinctly define top management's lasting dedication to ever-improving quality and productivity.

Deming's 14 Points to Improve Quality

Promote education: Establish a robust education program and encourage self-improvement for everyone.

Eradicate targets: Remove work standards that dictate numerical goals for the workforce and management.

Establish leadership: Adopt and establish leadership aimed at helping people and machines to do a better job.

Establish training on the job: Establish modern methods of training on the job.

Stop 'lowest tender' contracts: Stop the practice of awarding business contracts purely on the basis of lowest price tag.

Deming's 14 Points to Improve Quality

Stability of purpose: Create stability of purpose for continuous improvement of product and service.

End reliance on inspection: Do not try to achieve quality through the need for mass inspection.

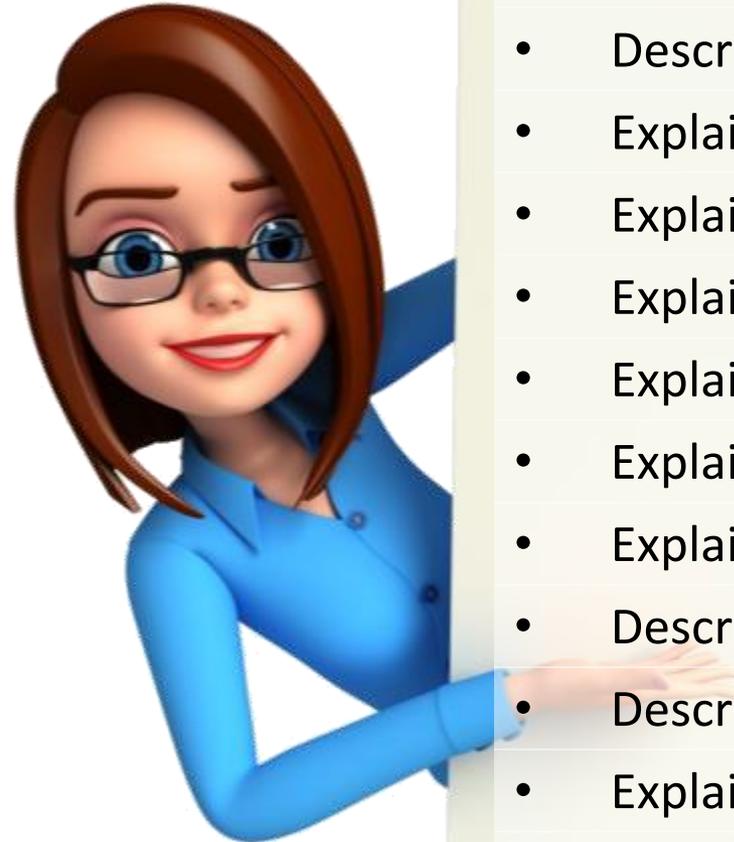
Improve every process: Try and improve every process for planning, production and service in a constant, continuous and forever manner.

Cut down roadblocks: Cut down roadblocks between department and staff areas.

Eradicate incitements: Remove the use of slogans, posters and incitements.

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- Explain Kinds of Measurements in TQM
- Explain the STINGER Principle
- Describe the Various Tools used in TQM
- Describe the Focus Areas of TQM
- Explain the Steps for the Quality Improvement Process
- Explain Four Absolutes of Quality Improvement Process
- Explain the Implementation of TQM
- Explain Deming's 14 Points to Improve Quality
- List the Benefits of TQM



Benefits of Total Quality Management (TQM)

The following are the key benefits of Total Quality Management (TQM) :

- ① **Reduced Production Costs**
- ② **Reduced Overhead Costs**
- ③ **Improved Customer Satisfaction**
- ④ **Reduced Cycle Times**
- ⑤ **On-Time-Delivery**
- ⑥ **Greater Ease of Expansion**
- ⑦ **Higher Expectations**
- ⑧ **Positive Changes to Corporate Culture**

Reduced Production Costs

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Total Quality Management (TQM) helps to significantly lower defect rates. Hence, the company can eliminate wastage of materials and inefficient use of labor which is associated with defects.

Reduced Overhead Costs

The following are the key benefits of Total Quality Management (TQM) :

- ① **Reduced Production Costs**
- ② **Reduced Overhead Costs**
- ③ **Improved Customer Satisfaction**
- ④ **Reduced Cycle Times**
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Total Quality Management (TQM) helps to significantly lower defect rates and implement process improvements so that similar defects don't recur. Hence, the company can reduce the amount of time that senior management and middle management spends resolving problems associated with high levels of defects. This also frees up management to focus on more value-added activities.

Improved Customer Satisfaction

The following are the key benefits of Total Quality Management (TQM) :

- ① **Reduced Production Costs**
- ② **Reduced Overhead Costs**
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Products with defects don't meet customer specifications and therefore cause the customer to be unhappy and sometimes even cancel orders. By significantly lowering defect rates, the company will be able to consistently deliver products to customers which strictly meet the customer's specifications and therefore increase customer satisfaction.

Reduced Cycle Times

The following are the key benefits of Total Quality Management (TQM) :

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Production costs greatly increase when the inventory takes longer time to move through the production process. However, with Total Quality Management (TQM), fewer problems arise during a manufacturing process, which means that the process can be consistently completed more quickly and therefore production costs, especially labor costs per unit produced, are lower.

On-Time-Delivery

The following are the key benefits of Total Quality Management (TQM) :

- ① **Reduced Production Costs**
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Many manufacturing companies face the problem of delayed shipments or deliveries to customers. These variations can be eliminated by implementing Total Quality Management (TQM).

Greater Ease of Expansion

The following are the key benefits of Total Quality Management (TQM) :

- ① **Reduced Production Costs**
- ② **Reduced Overhead Costs**
- ③ **Improved Customer Satisfaction**
- ④ **Reduced Cycle Times**
- ⑤ **On-Time-Delivery**
- ⑥ **Greater Ease of Expansion**
- ⑦ **Higher Expectations**
- ⑧ **Positive Changes to Corporate Culture**

Total Quality Management (TQM) will help companies to focus on process improvement and elimination of the sources of defects. This will help the companies to have a deep understanding of the potential causes of problems in expansion projects, as well as systems in place for measuring and identifying the sources of those problems. Hence, problems are less likely to occur as the company expands its production, and if it occurs, they can be resolved quickly.

Higher Expectations

The following are the key benefits of Total Quality Management (TQM) :

- ① **Reduced Production Costs**
- ② **Reduced Overhead Costs**
- ③ **Improved Customer Satisfaction**
- ④ **Reduced Cycle Times**
- ⑤ **On-Time-Delivery**
- ⑥ **Greater Ease of Expansion**
- ⑦ **Higher Expectations**
- ⑧ **Positive Changes to Corporate Culture**

By aiming for high-quality, TQM allows the company to set high expectations. Higher expectations themselves can lead to higher performance since they reduce the risk of complacency.

Positive Changes to Corporate Culture

The following are the key benefits of Total Quality Management (TQM) :

- ① **Reduced Production Costs**
- ② **Reduced Overhead Costs**
- ③ **Improved Customer Satisfaction**
- ④ **Reduced Cycle Times**
- ⑤ **On-Time-Delivery**
- ⑥ **Greater Ease of Expansion**
- ⑦ **Higher Expectations**
- ⑧ **Positive Changes to Corporate Culture**

Total Quality Management (TQM) is as much about people excellence as it is about technical excellence.

Therefore, with TQM, the company's corporate culture shifts to one that includes a systematic approach to quality, problem solving and a pro-active attitude among employees. Successful TQM programs also contribute to the overall sense of pride of the company's employees.

Video

Look at the video given below to understand the basics of TQM.

Click on the video link
to play it!

<https://www.youtube.com/watch?v=TejOz5BLKwg>

Practice

Let us now practice all that you have learned about Total Quality Management (TQM).

Practice

Choose any company of your choice that has adopted TQM. Observe and note down the following:

- **How does the company follow the TQM Philosophy and Principles?**
- **How do the customers perceive the quality of the products of this company?**
- **What level of growth and market share does this company enjoy?**



Case Study

Peter Botham is a Project Manager at Zydus Inc., a leading automobile manufacturer.

Zydus has adopted the TQM Philosophy.

- 1. What role does management commitment play in TQM at Zydus?**
- 2. How can Peter ensure that his subordinates also contribute in the TQM process?**

Summary

- 'Total Quality Management' or 'TQM' may be defined as a continuous pursuit of excellent quality by creating the right skills and attitudes in people to prevent defects and satisfy customers/users totally at all times.
- The evolution of Total Quality Management (TQM) in history has taken place in four stages. These four stages are:
 - Stage 1: Quality Inspection (QI)
 - Stage 2: Quality Control (QC)
 - Stage 3: Quality Assurance (QA)
 - Stage 4: Total Quality Management (TQM)
- The five principles by which TQM is characterized are:
 1. Management's Commitment (Leadership)
 2. Focus on the Customer and the Employee
 3. Focus on Facts
 4. Continuous Improvements (Kaizen)
 5. Everybody's Participation

Summary

- Crosby believed that quality is conformance to requirement and can only be measured by the cost of non-conformance. Crosby proposed four absolutes for the quality improvement process. His four absolutes are:
 1. Definition of Quality – conformance to requirements
 2. Quality System – prevention
 3. Quality Standard – zero defects
 4. Measurement of Quality – price of non-conformance
- The following are the kinds of quality measurements that are needed in TQM:
 - Customer Satisfaction Index (CSI) or External Customers' Satisfaction
 - Employee Satisfaction Index (ESI) or Internal Customers' Satisfaction
 - Quality Checkpoints and Quality Control Points

Glossary

Click each alphabet to learn more.



Glossary

Click each alphabet to learn more.

- **Cause & Effect Matrix:** A prioritization matrix or diagram that enables selection of those process input variables (X's) that have the greatest effect on the process output variables (Y's).
- **Control Plan Summary:** A process control document that logically describes the system for controlling processes and maintaining improvements in order to ensure that products meet customer requirements all the times.

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Glossary

Click each alphabet to learn more.

- **Defect Opportunity:** Any situation in a process which presents a reasonable possibility of causing a defect on a unit of output which is important to the customer.
- **Defect:** Any failure of products or services to meet one of the acceptance criteria of the company's customers (internal or external).

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Glossary

Click each alphabet to learn more.

- **Fishbone Diagram (Cause & Effect diagram):** Also known as a "Fishbone" or "Ishikawa Diagram", a channelled brainstorming tool used for determining root-causes (the bones of the fish) for a specific effect, or problem.
- **Functional:** Functional means designed for or capable of a particular function or use

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Glossary

Click each alphabet to learn more.

- **Pareto Chart:** A tool for establishing priorities based on the Pareto principle, also known as the 80/20 rule, which is that 20% of the causes result in 80% of the impact.
- **Process Improvement:** Improvement approach focused on incremental changes/solutions to eliminate or reduce defects, costs or cycle time.

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Glossary

Click each alphabet to learn more.

- **Sigma (σ):** Sigma (σ) is the Greek letter used to represent standard deviation in statistics.
- **Statistical Process Control (SPC):** Use of data gathering and statistical analysis to monitor processes, identify performance issues, measure variation and capability, and distinguish between common and special cause.

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TOTAL
QUALITY

You have Successfully Completed
the Module on

Total Quality Management
(TQM)!

Congratulations