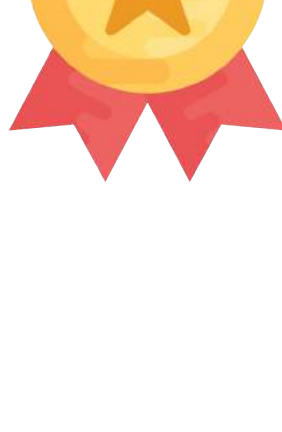


# COST OF QUALITY

- Quality is concerned with conformance to specification; ability to satisfy customer expectations and value for money.
- Cost of quality is important in terms of continuous improvement process.
- The cost of control/conformance and the cost of failure of control/non-conformance is the quantitative measure of COQ.
- It is the sum of the costs related to prevention and detection of defects and the costs incurred due to occurrences of defects.



## EXAMPLE

Let's take an example of an Hotel named XYZ

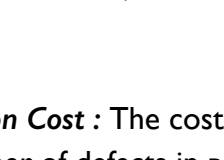
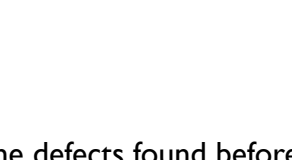


## Categories Of COQ

1. Internal Failure Cost
  2. External Failure Cost
- } These costs are related with poor quality products

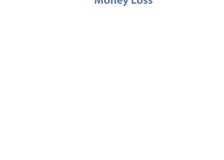
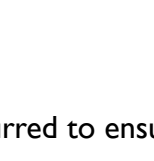
3. Prevention Cost
  4. Appraisal Cost
- } These costs are related with good quality products

**External Failure Cost :** It relates to defects found after delivery to the customers. In the given example, the customer returns Pav Bhaji because it lacked quality and that failure occurred only when he ate the Pav.

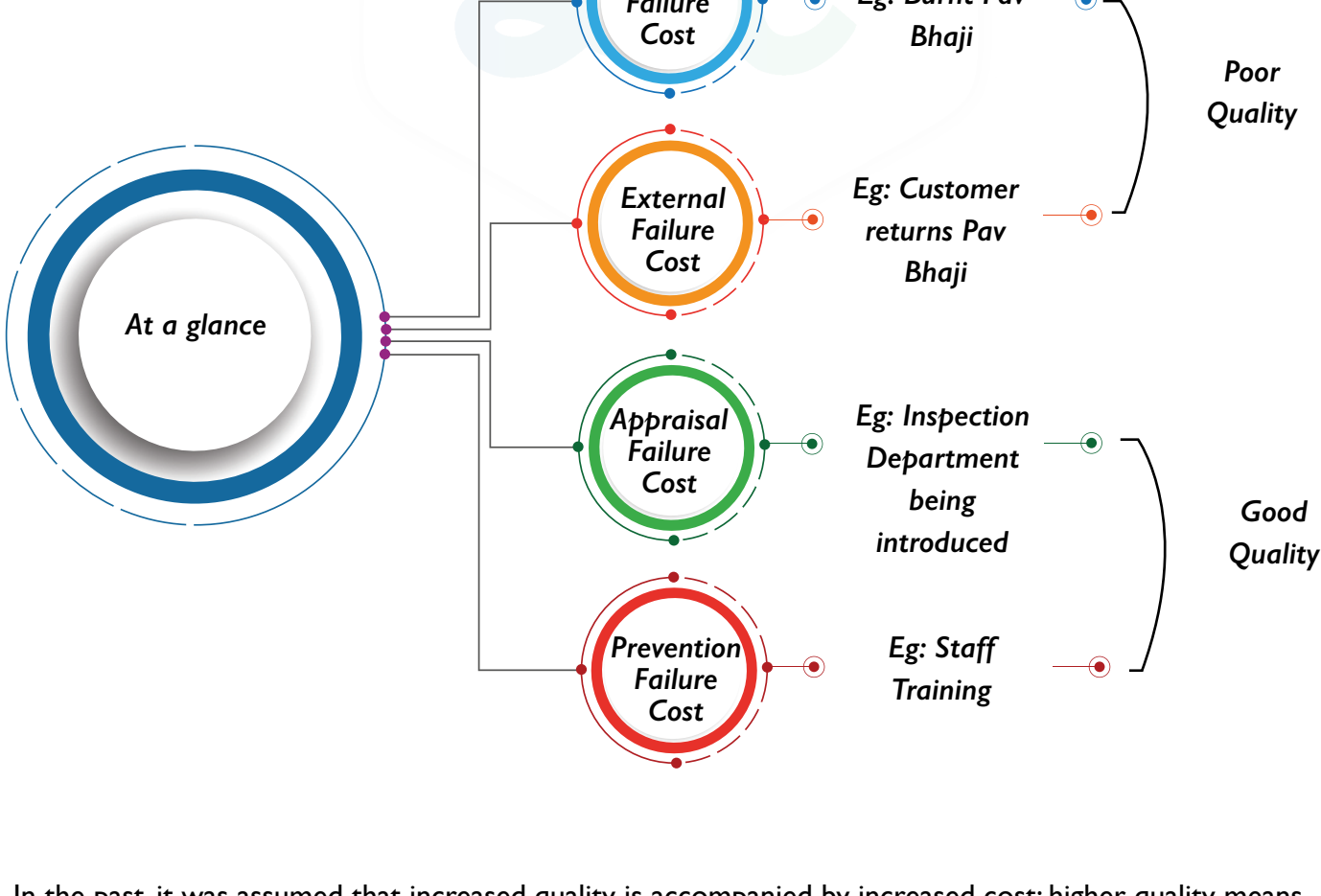


**Internal Failure Cost :** It relates to the defects found before delivery to the customer. In the given example, the quality of Pav Bhaji has reduced only because of the chef's negligence.

**Prevention Cost :** The costs that are incurred in order to reduce the number of defects in products and services. In the given example, Hotel XYZ initiates training program for its employees to ensure quality products are offered to the customers.



**Appraisal Cost :** These costs are incurred to ensure that the quality of the products meets customer requirements such as Inspection, Testing etc.. In the given example the Hotel can include an another inspection department to check the quality of food.

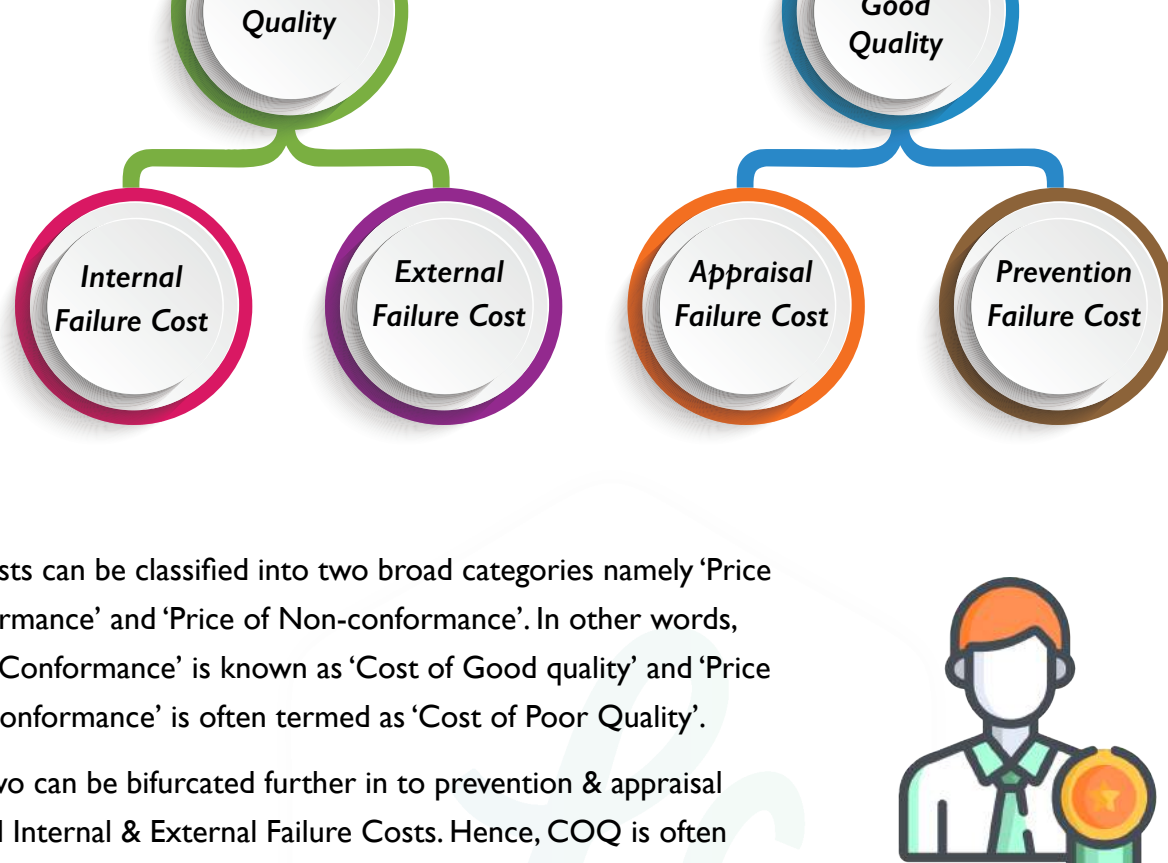


In the past, it was assumed that increased quality is accompanied by increased cost; higher quality means higher cost.

Today , the practitioners view Cost of Quality as per the following categories:

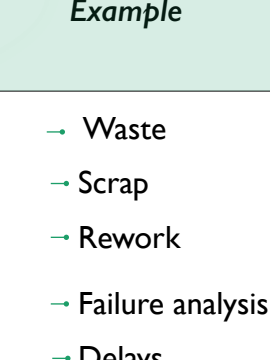
1. Higher quality means higher cost
2. The resultant savings are greater than the cost of improving quality
3. Quality costs are those incurred in excess of those that would have been incurred

## Components of COQ



COQ costs can be classified into two broad categories namely 'Price of Conformance' and 'Price of Non-conformance'. In other words, 'Price of Conformance' is known as 'Cost of Good quality' and 'Price of Non-conformance' is often termed as 'Cost of Poor Quality'.

These two can be bifurcated further in to prevention & appraisal costs and Internal & External Failure Costs. Hence, COQ is often referred as PAF (Prevention, Appraisal & Failure) model.



Types of Quality Costs	Explanation	Example
<b>Internal Failure Cost</b>	<ul style="list-style-type: none"> <li>→ Cost associated with defects found before the customer receives the product or service.</li> <li>→ Costs that are caused by products or services not conforming to requirements or customer/user needs and are found before delivery of products and services to external customers.</li> </ul>	<ul style="list-style-type: none"> <li>→ Waste</li> <li>→ Scrap</li> <li>→ Rework</li> <li>→ Failure analysis</li> <li>→ Delays</li> <li>→ Re-designing</li> <li>→ Shortages</li> <li>→ Failure analysis</li> <li>→ Re-testing</li> <li>→ Downgrading</li> <li>→ Downtime</li> <li>→ Lack of flexibility and adaptability etc</li> </ul>
<b>External Failure Cost</b>	<ul style="list-style-type: none"> <li>→ Deficiencies are caused both by errors in products and inefficiencies in processes.</li> <li>→ Costs incurred to medicate defects discovered by customers.</li> <li>→ Costs that are caused by deficiencies found after delivery of products and services to external customers, which lead to customer dissatisfaction.</li> </ul>	<ul style="list-style-type: none"> <li>→ Repairs and servicing</li> <li>→ Warranty claims</li> <li>→ Complaints Returns</li> <li>→ Complaints</li> <li>→ Repairing good and redoing services</li> <li>→ Warranties</li> <li>→ Losses due to sales reduction</li> <li>→ Environmental costs</li> </ul>
<b>Appraisal Costs</b>	<ul style="list-style-type: none"> <li>→ The need of control in product and services to ensure high quality level in all stages, conformance to quality standards and performance requirements is Appraisal Costs.</li> <li>→ These are costs associated with measuring and monitoring activities related to quality.</li> <li>→ These are costs associated with measuring and monitoring activities related to quality.</li> <li>→ Appraisal Cost incurred to determine the degree of conformance to quality requirements (measuring, evaluating or auditing).</li> </ul>	<ul style="list-style-type: none"> <li>→ Verification</li> <li>→ Quality Audits</li> <li>→ Supplier rating</li> <li>→ Checking and testing purchased goods and services</li> <li>→ In-process and final inspection/test</li> <li>→ Field testing</li> <li>→ Service or product audits</li> <li>→ Calibration of measuring and test equipment</li> </ul>
<b>Prevention Costs</b>	<ul style="list-style-type: none"> <li>→ Costs incurred for preventing the poor quality of products and services may be termed as Prevention Cost.</li> <li>→ These costs are incurred to avoid quality problems. They are planned and incurred before actual operation and are associated with the design, implementation &amp; maintenance of the quality management system.</li> <li>→ Prevention costs try to keep failure and appraisal cost to a minimum.</li> </ul>	<ul style="list-style-type: none"> <li>→ Quality planning</li> <li>→ Quality assurance</li> <li>→ Supplier evaluation</li> <li>→ New product review</li> <li>→ Error proofing</li> <li>→ Capability evaluations</li> <li>→ Quality improvement team meetings</li> <li>→ Quality improvement projects</li> </ul>

The Total Quality Costs are the sum of all these costs.

Cost of Quality (COQ)

Cost of Control

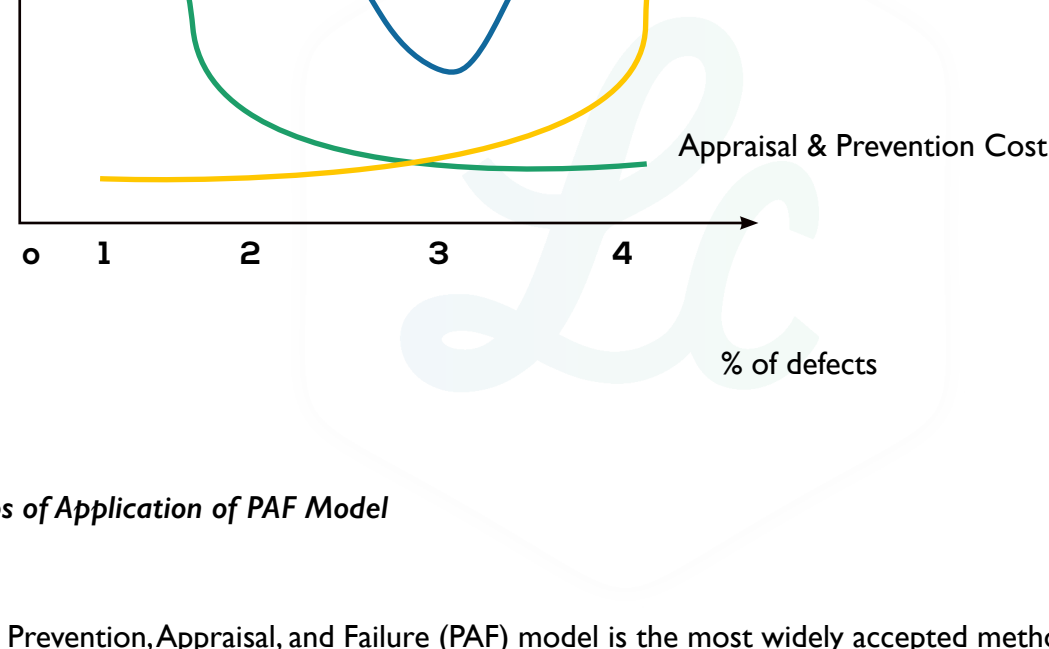
(Prevention Cost + Appraisal Cost)

Cost of Failure of Control

(Internal Failure Cost + External Failure Cost)

## OPTIMAL COQ

It is generally accepted that an increased expenditure in prevention and appraisal is likely to result in a substantial reduction in failure costs. Because of the trade off, there may be in an optimum operating level in which the combined costs are at a minimum. Hence it is further argued that striving for zero defects through a program of continuous improvements is not good for the economic interest of the company.



## Steps of Application of PAF Model

The Prevention, Appraisal, and Failure (PAF) model is the most widely accepted method for measuring and classifying quality costs. Following is the process of the PAF Model:

Apply some assumptions to that data in order to quantify the data

Allocate resources to combat the weak-spots



Gather some basic information about the number of failures in the system

Chart the data based on the four elements listed above and study it

Do this study on a regular basis and evaluate your performance

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