



مجموعة جامعة
الجميع الذكية
للتعليم القابضة

MIDOCEAN
UNIVERSITY

Project Quality Management

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Lecture 6: (execution stage)
Monitoring and controlling the Deliverable-fit technicality
Performing HPMQA (DFT - Quality conformance)

The story of the execution phase

- The stage of being succussed or failed from the 3d of the HPQMS
- Create superior competitive advantage.
- Branding Experience .

Causes -defect

Variables- Attributes

errors - Defects

HPMQS and COQ

Building quality :

Fewer revenues are spent on rework and scrapping of elements in non conformance quality.

Designing quality :

it becomes (self-regulator)that focusing on minimizing (standard) deviations in key business applications or “making zero-defect products, profitably,” hence minimizing excess costs and controlling quality

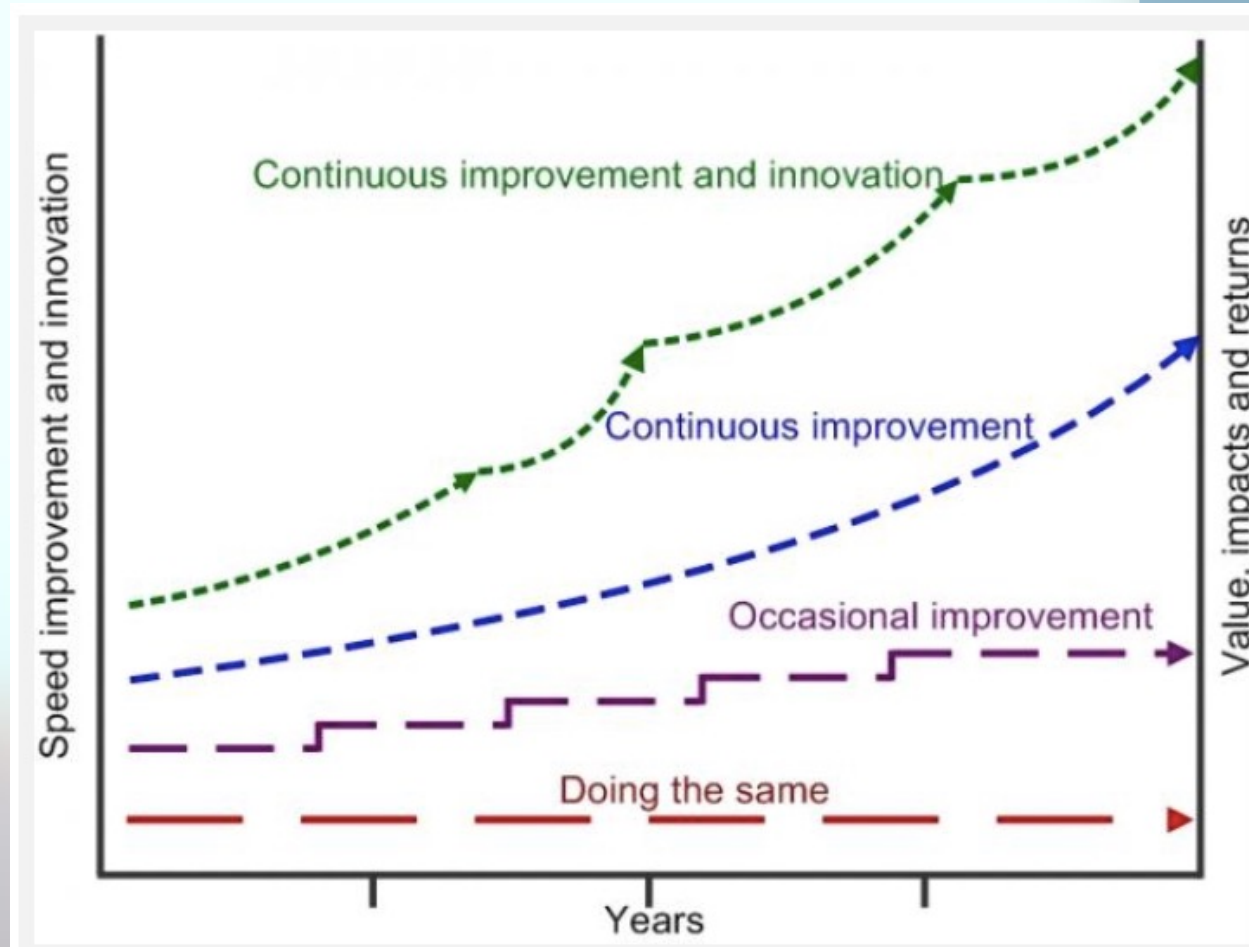
Continual quality improvement :

the process of constantly seeking ways to improve the quality of products, services, and processes within an organization.

By focusing on continuous quality improvement, organizations can enhance customer satisfaction, reduce costs, increase efficiency, and maintain a competitive edge in the market.

Branding

The relationship between the HPMQA and HPMQCI



PLC	Its quality function	HPMQS	Its quality function
X	X	BPP Stage	Holistic project quality planning
X	X	PFS-QP	
Initiation Stage	X	Project -Fit success criteria	
Planning Stage	Project quality planning	Developing PDQP	Holistic quality plan
Execution stage	Performing Quality plan	Executing the deliverable quality plan	HPMQA/HPMQC
Monitoring and controlling the execution phase	PQA verification 1	HPMQA/HPMQC	HPMQA(verification 1)
	X	HPMQC	HPMQC (validation2)
	X	HPMQC and project manager	Project assessment (validation 3)
	X	HPMQA - project manager and the customers	Customer acceptance (validation 4) -Project scope validation
Closure	PQC validation 1	Unofficial project closure	Project manager with PDQP leader
	X	Official project closure	Project manager with sponsor (agreed on PFS)
X	X	BFS (Post - implementations)	HPMQCI Validation 5- having BVA

Lecture outline

1st section content:

The impact of the HPMQA on the DFT and PjT

2nd section contents :

HPMQA short term and long term decisions based on the cost of poor quality

3rd section contents :

HPMQA process with the basic quality tools

Why did traditional project quality management cause the project failure ?

The big mistake is that some of project managers who have a problem regarding the time or/and cost or /scope , first decision will be bypassed the HPMQA activities as appraisal and prevention costs because they think that those quality activity doesn't provide additional value any values regarding there problems of the project targets

HPMQA

is a systematic process of verifying scope processes are important for a project as they ensure that the deliverable is defect free and meets the user's requirements.

It is involving analyzing, measuring, improving, and controlling the DFT process stabilization during and after the build process.

- **Assuring conformance** to customer requirements ,means the product or service does what it is intended to do.
- **Assuring conformance** to external and internal standards and procedures
- **Facilitating traceability** , what a product or service costs users if it doesn't do what it is supposed to do.

The impact of the HPMQA on the DFT and PjT

HPMQA -DFT is verifying scope processes are important for a project as they ensure that the deliverable is defect free and meets the user's requirements.

HPMQA-PjT should also verify that the project quality processes are actually being followed. For instance, if the team had a formal process for managing issues and scope changes, an audit would review

- Review of the Issues Logs, Scope Change Logs, schedule activities, Status Reports, etc.

- And the information from preparation, planning, sponsor, process owner, and subject matter experts to **identify** root causes of problems and ensuring compliance with PFS quality.

The target

Done-DFT

1. **Defining Quality** means developing expectations or standards of quality includes stakeholder perception and expectations of quality that state the expected level of performance for building the deliverables system.
2. -Standards can be developed for inputs, processes, or outcomes (expected outputs, results or impact on project status).
3. -if standards do not exist, practitioners must design or adapt them from international standards.

1. **Improving Quality** put use to quality improvement methods, such as problem-solving, process redesign, or re-engineering, to bridge the gap between current and expected quality levels.
2. The efforts for quality improvement are aimed at **eliminating defects** that are out of conformance, minimizing the need for scrap and rework, and hence overall reduction in deliverable production costs.
3. This core function involves identifying desired improvements are (ADD) :Analyzing building deliverable processes, Developing and testing solutions, and Deciding whether to abandon, modify, or implement them based on testing results.



1. **Measuring quality** is easier with a clear definition or standard, because the indicators are directly derived from the defined standards.
2. Measuring the degree of conformance to predetermined specifications and standards, and deviations from these standards can lead to defects also referred to as non conformance quality, unacceptable, or poor quality and low reliability
3. measuring quality leads directly to identifying areas for improvement or enhancement



The HPMQA and Cost Of Quality (COQ)

What are the principles of HPMQA?

quality management principles— which are not customer focus, not leadership, engagement of people, not process approach, not evidence-based decision and so on

The updated HPMQS quality principles

Why does HPMQA need to manage the COQ?

It is the total of the costs incurred by:

1. Investing in the prevention of nonconformance to requirements.
2. Appraising an element for conformance to requirements.
3. Failing to meet requirements.

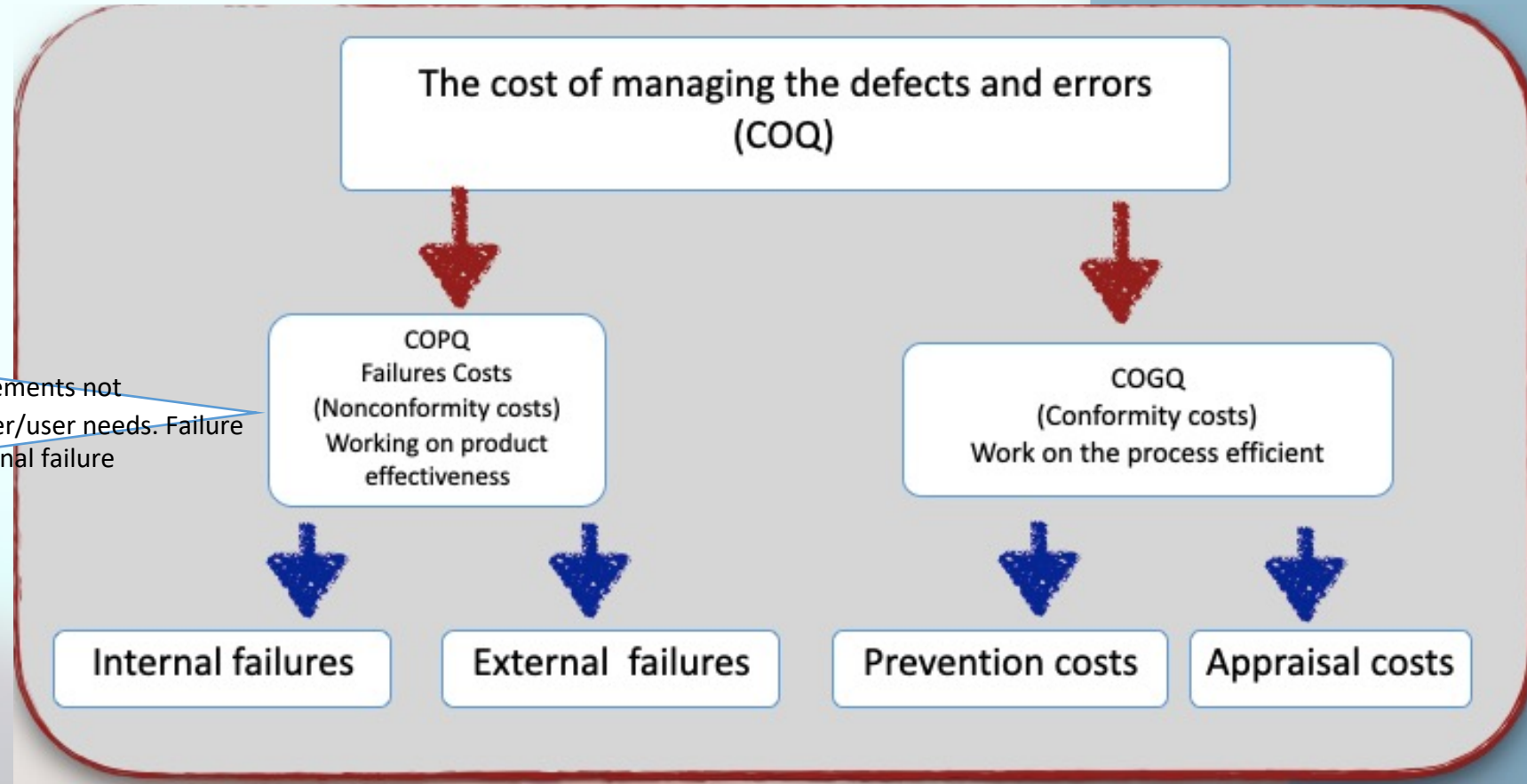
To achieve The HPMQA targets

1. Assuring conformance to customer requirements ,means the product or service does what it is intended to do.
2. Assuring conformance to external and internal standards and procedures
3. Facilitating traceability , what a product or service costs users if it doesn't do what it is supposed to do.

Quality cost is a HPMQA success factor

Lecture 7

These are costs resulting from elements not conforming to requirements or customer/user needs. Failure costs are divided into internal and external failure categories.



prevention costs “Design quality approach” (prevent poor quality)

-The costs of prevention are the expenses that are related to any activity meant to stop an error or defect from occurring .

-Quality review and evaluation processes also create prevention the costs of all activities specifically designed to prevent poor quality in element.

-These costs can be divided into two categories: identify areas where errors can be removed or where quality-related processes can be improved

It is included all the costs of:

-whether those reviews are related to suppliers, products, processes, or people. Customer surveys, the creation of technical manuals, work to create and manage requirements and specifications, and the management of job descriptions can all lead to prevention costs

-.HPMQS (BPP stage- Preparation stage -Selective the fit project)

Appraisal costs “Building quality approach”

-The appraisal costs might include expenses related to measuring, evaluating or auditing elements to assure conformance to quality standards (quality-related processes c)and performance requirements (errors) on products, services, or processes,

inspection/test of purchased material; in-process and final inspection/test; product, process or service audits; process of **measuring and test equipment**

It is included all the costs of:

the costs of field tests. Prototype inspections, consulting expenses, financial reporting and auditing, security checks, safety checks, supplier certifications, employee surveys, and customer feedback are all further examples of areas where appraisal costs might exist.

-**conducting the 5 integration levels of the HPMQS validation process .**

1-The relationship between them

Costs that are considered in the definition of prevention costs are those that **must** be incurred if the current cost of failure and appraisal is to be **reduced**.

These represent an investment in the “**Continuous Improvement**” initiative and, if effective, should result in a significant reduction of the overall costs. Obviously, these costs are likely to be small otherwise the failures would not occur and relevant appraisal cost would not be necessary.

2-The relationship between the appraising cost and Project risk management plan

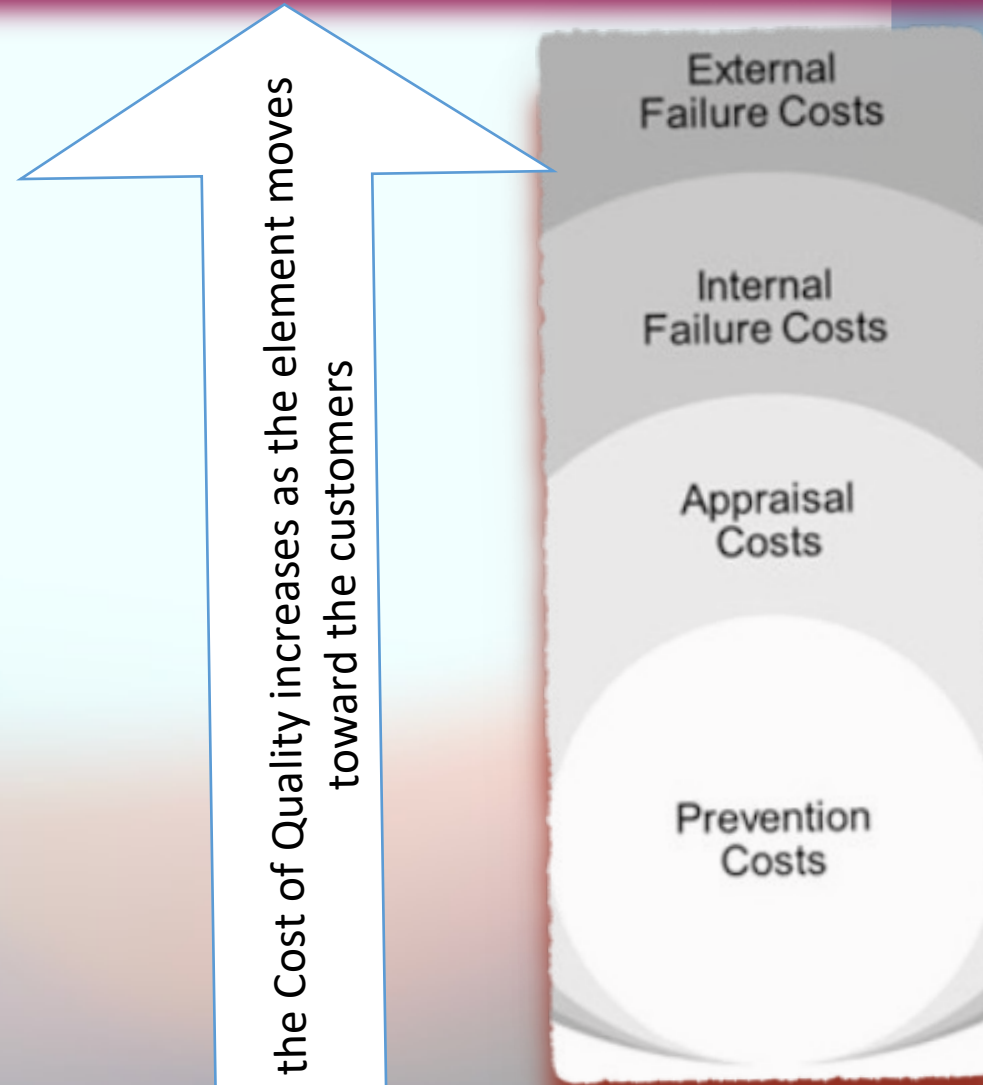
Costs that are considered in the definition of appraisal costs are those that are related directly to the **likelihood of occurrence of error or failure**.

There are those costs that **must** be incurred **regardless** of the likelihood of occurrence of the regarding the identified risk event, why????????

because the **consequences** of such an event are severe and potentially deliverable threatening.

Such is the case for many of the controls and procedures at power stations. This form costs are not to be considered in this definition of appraisal costs. Because they will always be incurred regardless of the likelihood of occurrence of a threatening risk event.

3-The relationship between the COQ and the Customers satisfaction



HPMQA check list for selecting the right cost of quality

Questions help teams **identify areas** where errors can be **removed** or where **quality-related processes** can be **improved**. If you think an activity related to a process might be an **unnecessary** form of prevention or appraisal, ask:

1. Does the activity itself add any **value** to the output?
2. Does the activity substantially reduce the **time** it takes for the process to produce an output?
3. Does the activity substantially increase the **cost** of the process?
4. If the activity is designed to prevent defects within the **process**, can the activity be made more efficient?
5. If the activity is designed to prevent defects, can the **activity** be made less expensive?
6. If an activity is designed to capture **quality** data about the process for reporting purposes, are those reports necessary?
7. If **quality reports** are necessary– either because of obligatory requirements -internal deliverables as compliance indicator or because the reports provide value in another process – can the reports be automated to reduce associated expense?



The HPMQA basic measuring/analysing process

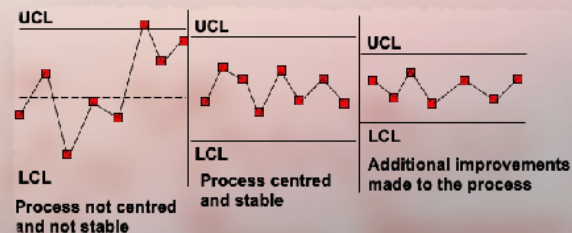
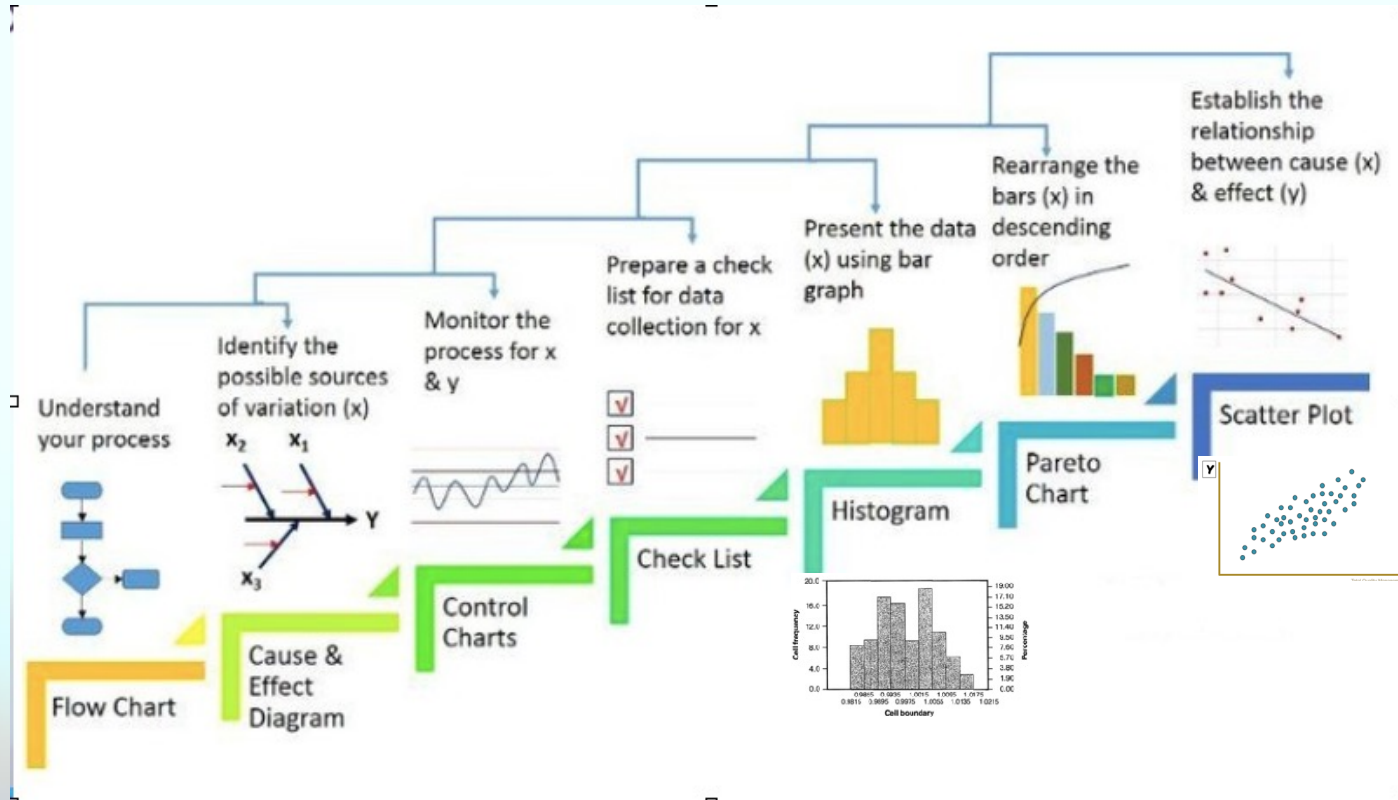
Performing standards Assessment for the building deliverables processes based on HPMQS by answering the Most critical questions with its related “common quality tools”

Analyzing a process in order to identify factors needing to be changed involves the use of data or ideas.

Such information needs to be presented in a way that allows ease of interpretation. Visual representation of processes and information is one way of accomplishing this, and the tools typically used to reduce process variation.

Each performing HPMQA should be conducted to obtain clear answers to the following questions based on three sections (analyzing -solving -improving)to the events leading to occurrence of assignable causes of variations:

1. What happened?
2. Where did it happen?
3. When did it happen?
4. What changed?
5. Who was involved?
6. Why did it happen?
7. What is the impact?
8. Will it happen again?
9. How can recurrence be solved ?
10. How can recurrence be prevented ?



1. What happened?

Clarifying what actually happened is an essential requirement of identifying assignable causes.

The purpose of this first Reviewing question is to clearly and specifically identify and describe a problem detected on to focus a root cause analysis and corrective action efforts as follows :

A problem is

- (1) a deviation from a requirement or expectation; ; and/or
- (2) when “actual” observation is different from “should” observation; ; and/or
- (3) an undesirable event, situation, or performance trend;

Once a potential assignable cause has been identified, HPMA team must quantify its effects on the “process to be improved” outcomes in order to target the improvement efforts correctly and thereby avoid wasted resources.

Flowchart

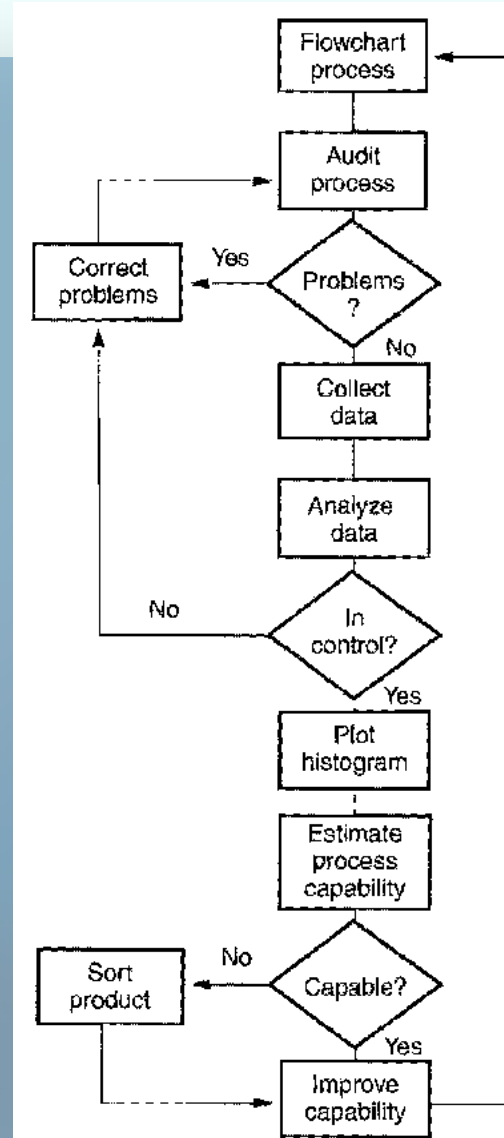
A flowchart is a map of the sequence of steps and decision points in a process.

-Flowcharting a process is a good starting point for a team, as it helps the group gain a common understanding of the process flow.

-Each team member typically has a perspective based on his/her own role, but may not have a full understanding of the entire process.

A flowchart may be used to:

- 1.Document the as-is condition of a process
- 2.Reflect changes that are to be made to a process
- 3.Design an entirely new process



2. Where did it happen?

-A clear description of the exact **location** of the **event** leading to occurrence of assignable causes helps isolate and resolve the problem.

-In addition to the location, the team members conducting gathering info. and should determine **if** the event leading to occurrence of assignable causes also occurred in locations similar to the one where the current process is executed.

Simply we need to know is the assignable causes uniques or systemic and widespread

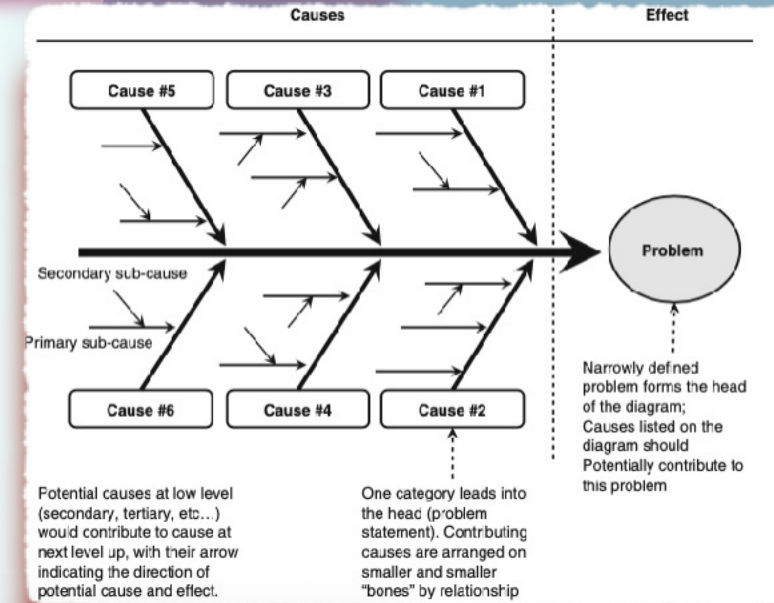
-Cause-and-Effect Diagram (Process analysis)

The cause-and-effect (C-E) diagram (also called an Ishikawa or a fishbone diagram) provides a way of collecting and organizing what may be a long list of potential causes that might contribute to a particular problem. (Organize the what s)

In a C-E diagram, the **problem** (the effect) is stated in a box at the right side of the chart, and likely **causes** are listed under major categories that can lead to the effect. (Where) The four M's (manpower, machinery, methods, and materials) are categories of problem sources typically used for manufacturing problems, although other headings such as environment and measurements are sometimes added.

The items for the diagram may be created through a **brainstorming** session or by a review of the relevant process **flowchart** to explore what can go wrong at each step.

Once the C-E diagram is completed, the potential causes should be organized and ordered so that internal and external relationships are clear.



3. When did it happen?

Isolating the specific time that an event occurred greatly improves the project team's ability to determine its source.

When the actual time frame of an event leading to occurrence of an assignable cause is known, it is much easier to quantify the process, operations, and other variables that may have contributed to the event.

This type of investigation, in most cases, will isolate the timing to events such as the following:

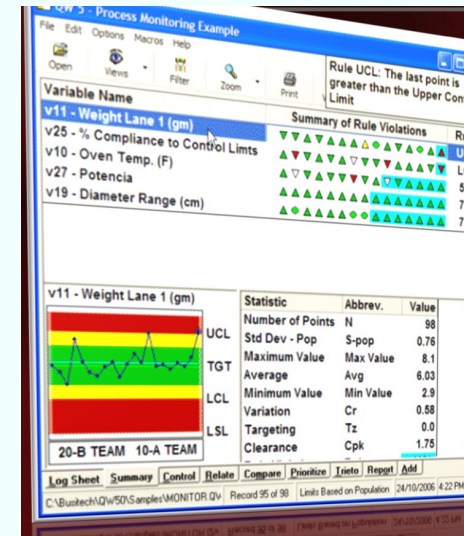
1. Production of a specific product.
2. Work schedule of a specific operating team.
3. Changes in human resources and intervention.
4. Changes in methods and procedures used in every step of the process.
5. Changes in management systems and methodologies.
6. Changes in ambient environment.

-Control Charts

Control charts are a refinement of the original run chart, which does not include control limits. A control chart serves two vital purposes as a data-gathering tool:

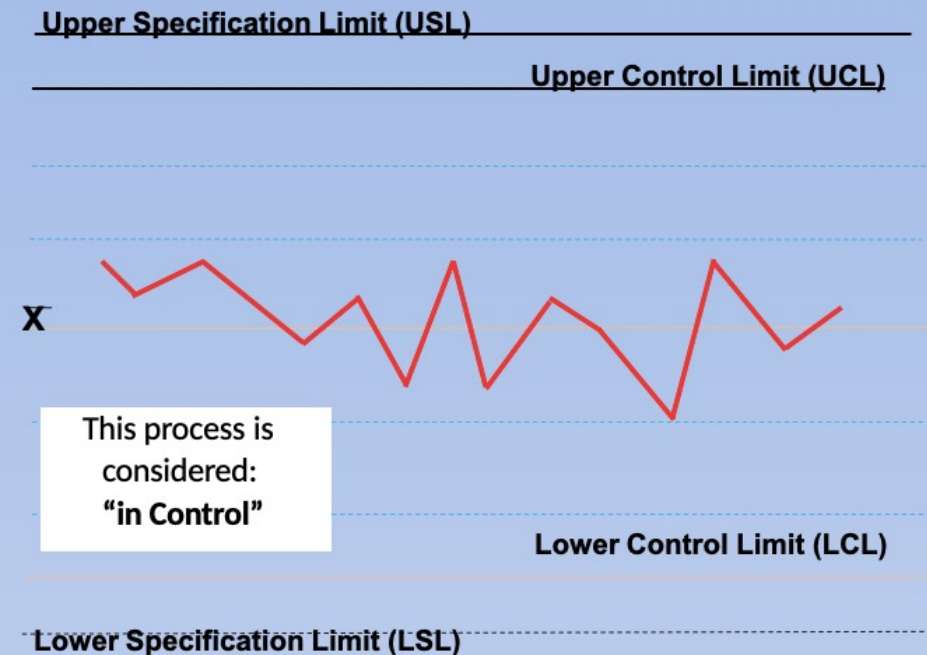
- (1) it shows when a process is being influenced by special causes, creating an out- of-control condition, and
- (2) it indicates how a process behaves over time.

Control charts should be examined for nonrandom patterns of data points; such an analysis of patterns can indicate what source of variation is most likely creating the condition (for example, which of the causes in the C-E diagram is most likely influencing the process). **Patterns** could reflect wildly fluctuating values, sudden process jumps or shifts, a gradual trend, or increased variation. Each of the causes in the C-E diagram is likely to create only a particular type of pattern, making the control chart a valuable diagnostic tool. The pattern might also reveal improvement in a process, indicated by decreased variation. Investigating this change to find the cause may provide deeper learning.



The Rule Violations Summary screen displays the numerical value entered or calculated for a variable through the use of colors, diamonds and arrows. The colors indicate the zone the value equates to:

- Green: on target and in control
- Yellow: in control but closer to a control limit than target
- Red: out of control but within specification limit
- White: out of specification limit



4-. Who was involved?

The HPMQA team should identify all personnel involved, directly or indirectly, in the event leading to occurrence of assignable causes. **Events leading to occurrence of assignable causes** often result from human actions or inadequate skills to execute the process. However, the HPMQA team must remember that the purpose of these gathered info. is to identify and quantify assignable causes that are displayed on the process behavior charts, not to place blame.

This approach helps reduce fear of punishment for those directly involved in the occurrence of assignable causes of variations. In addition, it reduces prejudice or preconceived opinions about individuals within the enterprise business.

-The check sheet

The check sheet (sometimes called a tally sheet) is used for gathering information to analyze. As with most of the tools, it facilitates the use of facts, rather than just opinions, in talking about and solving problems. Check sheets are used to gather data on frequency of occurrence .

=Data from several check sheets can be organized into a Pareto chart for final analysis.

(This type of check sheet is sometimes called a measles chart or a defect data check sheet.)

Switch Assembly Op 236 Plastic footer Operator _____	
Chart began July 12, 2013	
Week 1	Totals
Burns III JHT	
Misrun III II	
Bad finish JHT	
Porosity I	
Flash JHT JHT I III I	
Color	

5. What changed?

Occurrence of assignable causes and major deviations from acceptable performance levels in process outcomes do not just happen.

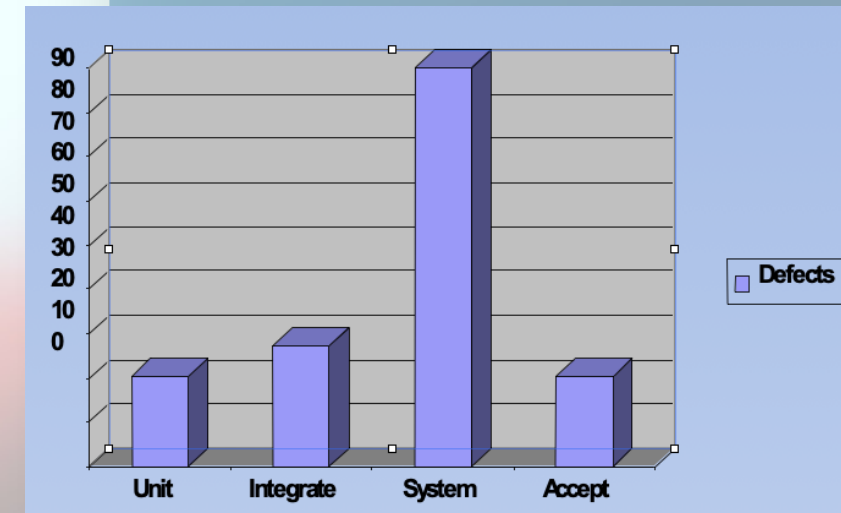
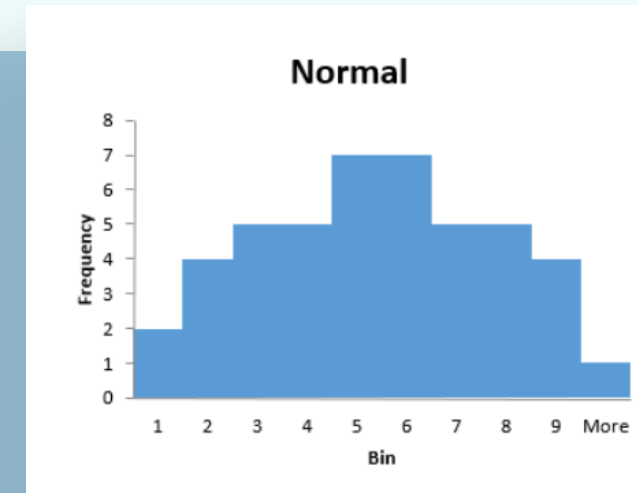
In every case, specific variables, singly or in combination, caused the event leading to occurrence of assignable causes to occur. Therefore, it is essential that **any changes** in the system that occurred in conjunction with the event be defined.

No matter what the event is (i.e., equipment failure, environmental release, accident, etc.), the project team must quantify all the variables associated with the event leading to occurrence of assignable causes.

Histograms

Control charts display process performance over time, while histograms display frequency distribution, detecting non-bell-shaped curves and relating process spread to specifications.

In the first, the data elements are concentrated toward the center. The histogram approximates what is called the bell curve, or normal curve. This shape is likely to indicate that the data used to create the histogram is normal data,



6. Why did it happen?

To identify and quantify an assignable cause, the project team must conduct a thorough analysis of the symptoms or perceptions. **Symptoms** are tangible evidence of a **problem**, not the **cause**.

1-A clear cause can be assigned based on these symptoms, but identifying and treating the real cause is crucial for preventing recurrence.

2- The project team should **generate a list of factors contributing to assignable causes**, including **both** real and assumed ones. Clear note of all assumptions and proven causes, and a sequence-of-events analysis helps separate fact from fiction during the analysis process.

7. What is the impact?

The project team should quantify the impact of the event leading to occurrence of assignable causes before embarking on a full cause-and-effect relationship analysis or a full root cause and failure analysis. Again, not all events, even some that are repetitive, warrant a full analysis.

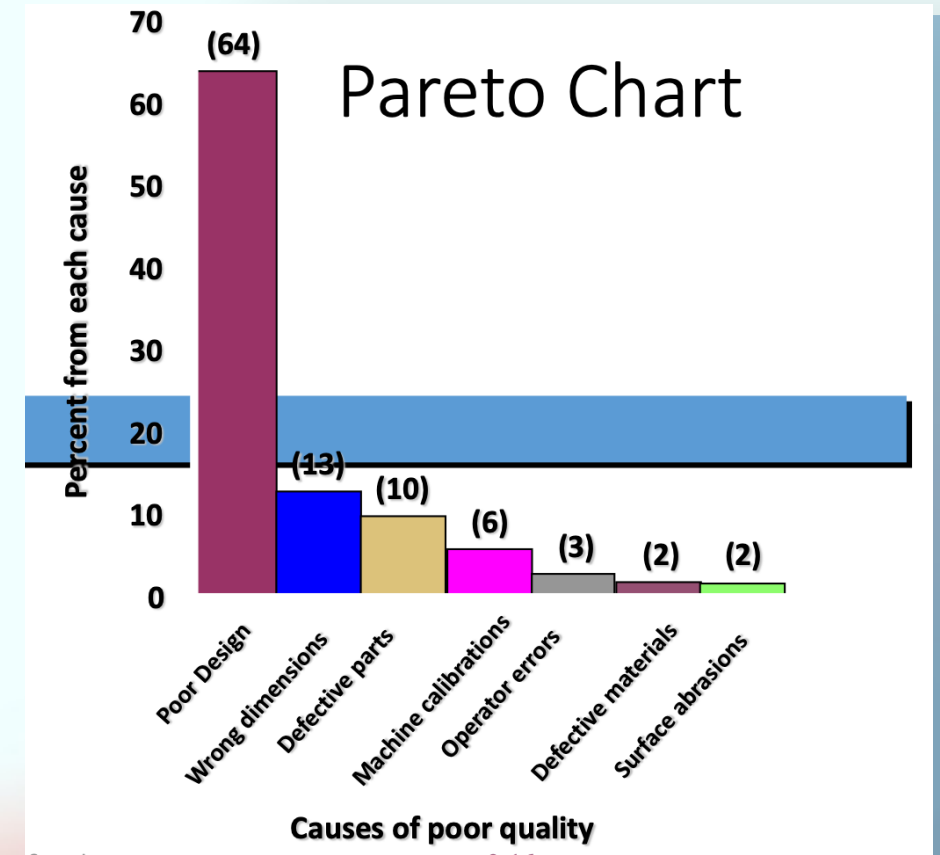
This part of the identification and quantification process should be as factual as possible. Even though all the details are unavailable at this point, the project team should attempt to assess the real or potential impact of the event.

Identified assignable causes must be quantified so that further **improvements** focus on the deep assignable causes, and not on the original symptoms of “process to be improved” underperformance.

Pareto Chart(ranked histogram)

Pareto chart that indicates how much each work center contributes to quality costs. Pareto analysis could also be used by a supervisor within each of the higher-cost work centers to pinpoint the particular machines that are the primary sources of trouble

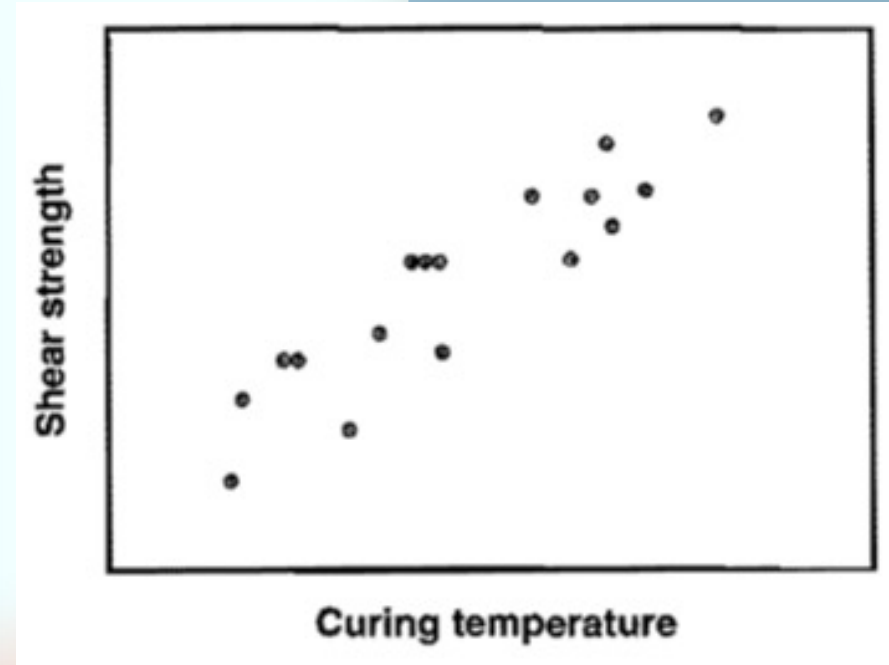
Pareto Principle, or 80/20 rule, which says that 20 percent of the causes lead to 80 percent of the results. Because of this, a Pareto chart is a good starting point for root cause brainstorming – teams can start with the few inputs or attributes accounting for the bulk of the Pareto chart. Just as you can “drill down” using the fishbone diagram, asking deeper and deeper “Why?” questions, you can drill down using a Pareto chart.



Scatter Diagram

A scatter diagram shows whether or not there is a correlation between two variables. Correlation does not necessarily mean a direct cause-and-effect relationship, however. If it appears that values for one of the variables can be predicted based on the value of another variable, then there is correlation.

While correlation does not prove causality, the lack of correlation may indicate that no cause-and-effect relationship exists.



II-Documentation verified root cause by using root cause verification matrix

II-Documentation regarding root cause verification is usually completed on a matrix that includes the problem, possible root causes, the verification method, why the verification method was chosen, results of the verification.

Problem	Possible Root Causes	Method of Verification	Reason for Verification Method	Verified?	Notes

Problem	Possible Root Causes	Method of Verification	Reason for Verification Method	Verified?	Notes
Cakes in the Delaware bakery are coming	Temperature too hot	Run chart of temperature against required temperature	Allows team to visually determine whether temperatures exceed requirements at any point during bake process	Yes	

III-On-Going Risk Notification

The HPMQA shall immediately verbally report to the Project Manager the discovery of problems, new risks, or previously known risks that have increased in risk probability or potential impact, which pose a risk of failure or danger to the success of the project.

2- and then shall develop and submit a written On-Going Risk Notification Report within two business days for an example

3-The on-going risk notification will follow the same requirements as defined for the initial risk assessment with an emphasis on managing risks that occur and change during the executing and implementation process.

On-going risk assessment will be conducted while conducting the quality assurance and quality control tasks.

8. Will it happen again? In case of nonrecurring assignable causes

If a first investigation finds assignable causes nonrecurring, the questing process may be discontinued. However, a thorough review of historical records is necessary to determine if the event is truly nonrecurring.

All reported events should be recorded and maintained for future reference. A full investigation should be conducted on events with a history of periodic recurrence or a high probability of recurrence,

9. In case of recurring assignable causes How can recurrence be solved ?

Although this is the next logical question to ask, it generally cannot be answered until the entire root cause analysis of assignable causes is completed.

- 1- **list of possible actions** that should be developed.
- 2- each should be evaluated as to its potential for success, cost and timing to implement, and other important criteria
- 3- A Simple processes such as ranking or multi-voting, or more scientific analysis using a matrix, are likely to be used in the selection process.
- 4- Then the Select and implement a solution.

During the execution phase of a project, PDQP team selects a **final solution** and begins to put it in place. Sometimes, teams will select more than one solution, especially if a few smaller solutions are highly related and work together for an overall solution. It can be hard to determine which **solution actually improves a process**, however, so it's usually a best practice to implement one change at a time and verify that change before moving on to something else.

10. In case of recurring assignable causes How can recurrence be prevented ?

1-Follow up to evaluate the effect As with any good corrective action process, however, it is necessary that the process be monitored after the solution has been implemented.

Tools for assessing whether the issue has been resolved include control charts and Pareto diagrams. There may have been no effect, a partial effect, or a complete resolution of the problem, depending on how well the solution was applied,

whether it was appropriate for the root cause, or if the real root cause wasn't discovered. If there was no impact, it is necessary to review the actions taken in the earlier stages of the problem-solving model to determine whether an error may have been made.

2-Standardize the process. Even if the problem has been resolved, there is one final step that needs to occur. The solution needs to be built into the process so that it will continue to work once focused attention on the problem is gone. A review to see what was learned from the project is also sometimes useful.

Output

1. Earlier detection when errors do occur, which keeps hidden costs down.
2. Employees are able to support and manage higher quality. Poor performance on a continuous basis does need to be addressed, but employees should not default to a negative feeling when they hear the word quality.
3. In-process quality assurance is actually more effective than post-process or over-process prevention and appraisal methods.
4. creates a positive impact on project process quality , deliverable production, and customer and employee satisfaction.
5. Stable process
6. Minimizing the cost of poor quality



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Thank You

