IT Project Management(ITec5111)

Chapter 8
Project Quality Management

What Is Project Quality Management?

- International Organization for Standardization (ISO) definition of quality
  - Totality of characteristics of an entity that bear on its ability to **satisfy stated or implied needs**
  - The degree to which a set of inherent/**essential characteristics fulfils requirements**
- Other definitions of quality
  - Conformance to requirements
    - Project's **processes** and **products** meet written specifications
  - Fitness for use
    - **Product can be used as it was intended**

What Is Project Quality Management? (cont'd)

- Project quality management **ensures the project will satisfy** the needs for which it was undertaken, stated needs/requirements
- Project quality management processes
  - **Planning quality management**: identifying **which quality standards are relevant** to the project and how to satisfy them
    - **Incorporating quality standards into project design is a key part of quality planning**.
    - For an IT project, quality standards might include
      - allowing for system growth
      - reasonable response time for a system
      - ensuring that the system produces consistent and accurate information.
  - **Performing quality assurance:** involves **periodically evaluating** overall project performance to ensure that the project will satisfy the relevant quality standards.
  - **Controlling quality**: monitoring specific project results to ensure they comply/fulfill with the relevant quality standards

Planning Quality Management

- Planning quality management implies the ability to anticipate/expect situations and prepare actions that bring about the **desired outcome**.
- The current thrust in modern quality management is the **prevention defect** methods through
  - Selecting proper materials, skilled human resource
  - Training and indoctrinating people in quality
  - Planning a process that ensures the appropriate outcome
- In project quality management planning, it is important:
  - to identify **relevant quality standards** for each unique project and
  - to design quality into the **products** of the project and the **processes** involved in managing the project.
- In quality planning for projects, it is important to **describe key factors that directly contribute** to meeting the customer's requirements.
  - Organizational policies related to quality, the particular project's scope statement and product descriptions, and related standards and regulations are all important input to the quality planning process.

Planning Quality Management (cont'd)

- Important scope aspects of IT projects that affect quality include:
  - Functionality: degree to which a system performs its intended function
  - Features: system's special characteristics that appeal to users
  - System outputs: screens/user friendly interface and reports the system generates
  - Performance addresses: how well a product or service performs the customer's intended use
  - Reliability: ability of a product or service to perform as expected under normal conditions, well exception handling mechanism
  - Maintainability: ease of performing maintenance on a product
- **All project stakeholders must work together to balance the quality, scope, time, and cost dimensions of the project**
- Project managers are ultimately responsible for quality management on their projects

Performing Quality Assurance

- Many companies understand the importance of quality assurance and have entire departments dedicated to it.
  - **They have detailed processes in place to make sure their products and services conform to various quality requirements**.
- **Quality assurance:** includes all the activities related to satisfying the relevant quality standards for a project
  - **goal of quality assurance is continuous quality improvement**.
- Important inputs for performing quality assurance are the quality management plan, process improvement plan, quality metrics, quality control measurements, and project documents.
- An important tool for quality assurance is a **quality audit**.
- **A quality audit:** is a structured **review of specific quality management activities** that help identify lessons learned that could improve performance on current or future projects

Controlling Quality

- One of the main goals of quality control is to improve quality
- The main outcomes of controlling quality are:
  - **Acceptance decisions**: determine if the products or services produced as part of the project will be accepted or rejected.
    - If they are accepted, they are considered to be validated deliverables.
    - If project stakeholders reject some of the project's products or services, there must be rework
  - **Rework**: is action taken to bring rejected items into compliance with product requirements, specifications, or other stakeholder expectations.
    - Rework often results in requested changes and validated defect repair, and it results from recommended defect repair or corrective or preventive actions.
    - Rework can be **very expensive**, so the project manager must strive to do a good job of quality planning and quality assurance to avoid this need
  - **Process adjustments**: correct or prevent further quality problems based on quality control measurements.
    - Process adjustments often result in updates to organization process assets and the project management plan

Controlling Quality(cont'd): Six Sigma

- Organizations worldwide use **Six Sigma principles** to improve quality, decrease costs, and better meet customer needs.
- The *Six Sigma Way* authors, Peter Pande, Robert Neuman, and Roland Cavanagh, define Six Sigma as:
  - A comprehensive and flexible system for achieving, sustaining, and maximizing business success.
  - Six Sigma is uniquely driven by close understanding of customer needs, disciplined use of facts, data, and statistical analysis, and diligent attention to managing, improving, and reinventing/renewing business processes.

Controlling Quality(cont'd): Six Sigma

- Projects that use Six Sigma principles for quality control normally follow a five phase improvement process called **DMAIC** (pronounced *de-MAY-ick), which stands for Define,* Measure, Analyze, Improve, and Control.
- DMAIC is a systematic, **closed-loop process** for continued improvement that is scientific and fact based.
- The core tool to the Six Sigma approach is the DMAIC roadmap (**phase of the DMAIC improvement process**) which is a more scientific method for project development.
    - Define
    - Measure
    - Analyze
    - Improve
    - Control

Controlling Quality(cont'd):Six Sigma phase of the improvement process:

- **Define***:* This step is used to figure out or define the problem/opportunity, process, and customer requirements.
  - Important tools used in this phase include a project charter, a description of customer requirements, process maps, and Voice of the Customer (VOC) data.
    - Examples of VOC data include complaints, surveys, comments, and market research that represent the views and needs of the organization's customers.
- **Measure***:* Measures are defined in terms of defects per opportunity, measure degree of defect**.**
  - Measure the current process and document the baseline performance.
- **Analyze**: Examine process details to find improvement opportunities.
  - The team investigates and verifies data to prove the **suspected root causes of quality problems** and substantiates/verifies the problem statement.
  - Here you are identifying **what is preventing the progress of the process**, so it can be eliminated.

Controlling Quality(cont'd):Six Sigma phase of the improvement process:

- **Improve*:* Generate solutions** and ideas for improving the problem.
  - A final solution is verified with the project stakeholders, and the Six Sigma team develops a plan to pilot test the solution.
  - The Six Sigma team reviews the results of the pilot test to refine the solution, if needed, and then implements the solution where appropriate.
- **Control*:*** Track and verify the **stability of the improvements** and the predictability of the solution.
  - In order to make sure that these improvements are sustainable, monitor them by creating a control plan.

Controlling Quality(cont'd): **Testing**

- Many IT professionals think of testing as a stage that comes near the end of IT product development
  - Testing needs to be done during almost every phase of the systems development life cycle, not just before the organization ships or hands over a product to the customer
- Types of tests
  - **Unit testing:** tests each individual component (often a program) to ensure it is as defect-free as possible
  - **Integration testing:** occurs between unit and system testing to test functionally grouped components
  - **System testing:** tests the entire system as one entity
  - **User acceptance:** testing is an independent test performed by end users prior to accepting the delivered system

Controlling Quality(cont'd): Testing

- Testing alone is not enough
  - Software defect must be changed before delivery of the program
- Testing does not sufficiently prevent software defects
  - The number of ways to test a complex system is huge
  - Users will continue to invent new ways to use a system that its developers never considered
- Developers must be responsible for providing error-free code at each stage of testing

Improving IT Project Quality

- In addition to some of the suggestions provided for **using good quality planning, quality assurance,** and **quality control,** other important issues that involved in improving the quality of IT projects are:
  - Strong leadership that promotes quality
  - Understanding the cost of quality
  - Providing a good workplace to enhance quality

Leadership

- A large percentage of quality problems are associated with management, not technical issues
  - Top management must take responsibility for creating, supporting, and promoting quality programs
- Leadership provides an environment conducive or helpful to producing quality
  - When every employee insists on producing high-quality products, then top management has done a good job of **promoting the importance of quality**

The Cost of Quality

- Cost of conformance plus the cost of nonconformance
  - Conformance means delivering products that meet requirements and fitness for use
  - Cost of nonconformance means taking responsibility for failures or not meeting quality expectations
    - There must be rework, needs additional cost

The Impact of Organizational Influences and Workplace Factors on Quality

- The organizational issues had a much greater influence on programmer productivity than the technical environment or programming languages
- A **dedicated workspace** and **a quiet work environment** were key factors to improving programmer productivity
- Top managers must focus on workplace factors to improve productivity and quality
  - **The manager's function is not to *make* people work but to make it possible for people to work by removing organizational influences ,political roadblocks/barriers**

Expectations and Cultural Differences in Quality

- Many experienced project managers know that a crucial aspect of project quality management is **managing expectations**.
- Different project sponsors, customers, users, and other stakeholders have different expectations about various aspects of the projects
  - It's very important to understand these expectations and manage conflicts that might occur due to differences in expectations.
- Expectations can also vary based on an organization's culture or geographic region.
  - Anyone who has traveled to different parts of an organization, a country, or the world understands that expectations are not the same everywhere.
- People who work in other countries for the first time are often amazed at different quality expectations.