Chapter 8: Project Quality Management

Managing Information Technology Projects, Sixth Edition

Schwalbe

Learning Objectives

- Understand the importance of project quality management for information technology/Multimedia products and services
- Define project quality management and understand how quality relates to various aspects of information technology/Multimedia projects
- Describe quality planning
- Discuss the importance of quality assurance
- Explain the main outputs of the quality control process

Microsoft Joke – General Motors

- At a computer expo (COMDEX), Bill Gates reportedly compared the computer industry with the auto industry and stated: "If GM had kept up with technology like the computer industry has, we would all be driving twenty-five dollar cars that got 1000 mile to the gallon."
- In response to Bill's comments, General Motors issued a press release stating, (by Mr. Welch himself) "If GM had developed technology like Microsoft, we would all be driving cars with the following characteristics:
- For no reason whatsoever your car would crash twice a day.
- Every time they repainted the lines on the road you would have to buy a new car.
- Occasionally your car would die on the freeway for no reason, and you would just accept this, restart and drive on.
- Occasionally, executing a maneuver such as a left turn would cause your car to shut down and refuse to restart. In which case you would have to reinstall the engine.
- Only one person at a time could use the car, unless you bought "Car95" or "CarNT." But then you would have to buy more seats.

This joke was found on hundreds of Web sites and printed in the Consultants in Minnesota Newsletter, Independent Computer Consultants Association, December 1998

Microsoft Joke – General Motors II

- Macintosh would make a car that was powered by the sun, reliable, five times as fast, and twice as easy to drive, but would only run on five percent of the roads.
- The oil, water temperature, and alternator warning lights would be replaced by a single "general car fault" warning light.
- New seats would force everyone to have the same size body. The airbag system would say "Are you sure?" before going off.
- Occasionally for no reason whatsoever, your car would lock you out and refuse to let you in until you simultaneously lifted the door handle, turned the key, and grabbed hold of the radio antenna.
- GM would require all car buyers to also purchase a deluxe set of Rand McNally road maps (now a GM subsidiary), even though they neither need them nor want them.
- Every time GM introduced a new model car, buyers would have to learn how to drive all over again because none of the controls would operate in the same manner as the old car.
- You'd press the "Start" button to shut off the engine.

This joke was found on hundreds of Web sites and printed in the Consultants in Minnesota Newsletter, Independent Computer Consultants Association, December 1998

What Is Project Quality?

- The International Organization for Standardization (ISO) defines quality as "the degree to which a set of inherent characteristics fulfils requirements" (ISO9000:2000)
- Other experts define quality based on:
  - Conformance to requirements: the project's processes and products meet written specifications
  - Fitness for use: a product can be used as it was intended

What Is Project Quality Management?

- Project quality management ensures that the project will satisfy the needs for which it was undertaken

- Processes include:
  1. Planning quality: identifying which quality standards are relevant to the project and how to satisfy them; a metric is a standard of measurement
  2. Performing quality assurance: periodically evaluating overall project performance to ensure the project will satisfy the relevant quality standards
  3. Performing quality control: monitoring specific project results to ensure that they comply with the relevant quality standards

Quality goals should be mesh with the goals of project management

- To reach the end of the project
- To reach the end on budget
- To reach the end on time
- To reach the end safely
- To reach the end error-free
- To reach the end meeting everyone's expectations

1. Planning Quality

- Implies the ability to anticipate situations and prepare actions to bring about the desired outcome
- Quality management plan
  - Detail all quality planning activities and who will perform them
  - It is used to:
    - How quality will be ensured
    - How the quality policy will be followed

Who's Responsible for the Quality of Projects?

- Project managers are ultimately responsible for quality management on their projects
- Several organizations and references can help project managers and their teams understand quality
  - International Organization for Standardization (www.iso.org)
  - IEEE (www.ieee.org)

2. Performing Quality Assurance

- Quality assurance includes all the activities related to satisfying the relevant quality standards for a project
- Another goal of quality assurance is continuous quality improvement
- 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

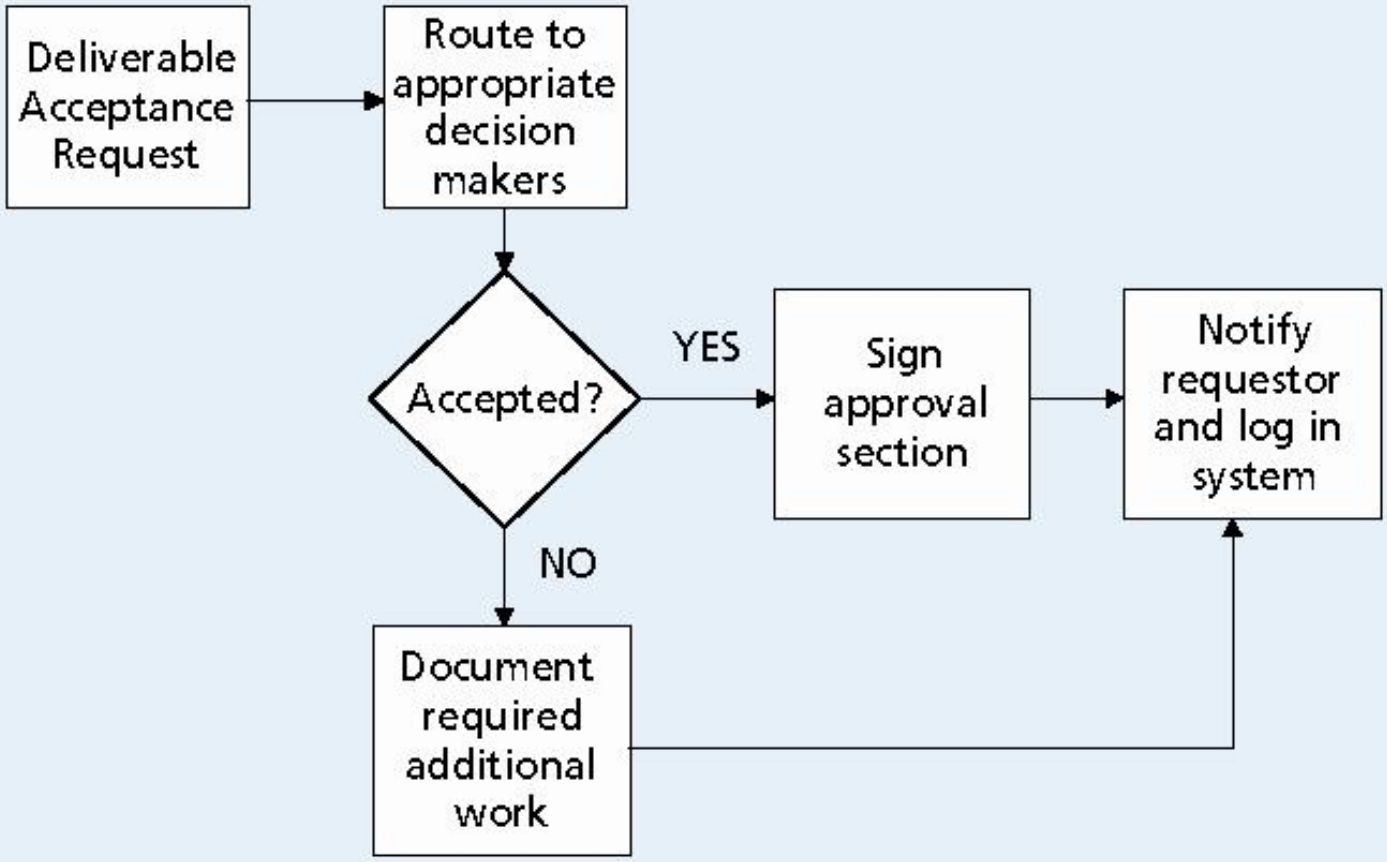
3. Quality Control

- Purpose
  - Meeting or exceeding client requirements and expectations
  - Preparing accurate documents (deliverables)
  - Finishing the design on time and on budget
  - Designing a project that can be built on time and on budget
- The main outputs of quality control are:
  - Acceptance decisions
  - Rework
  - Process adjustments
- Flowchart is one of the different Basic Tools of Quality that help in performing quality control

Flowcharts

- Flowcharts are graphic displays of the logic and flow of processes that help you analyze how problems occur and how processes can be improved
- They show activities, decision points, and the order of how information is processed

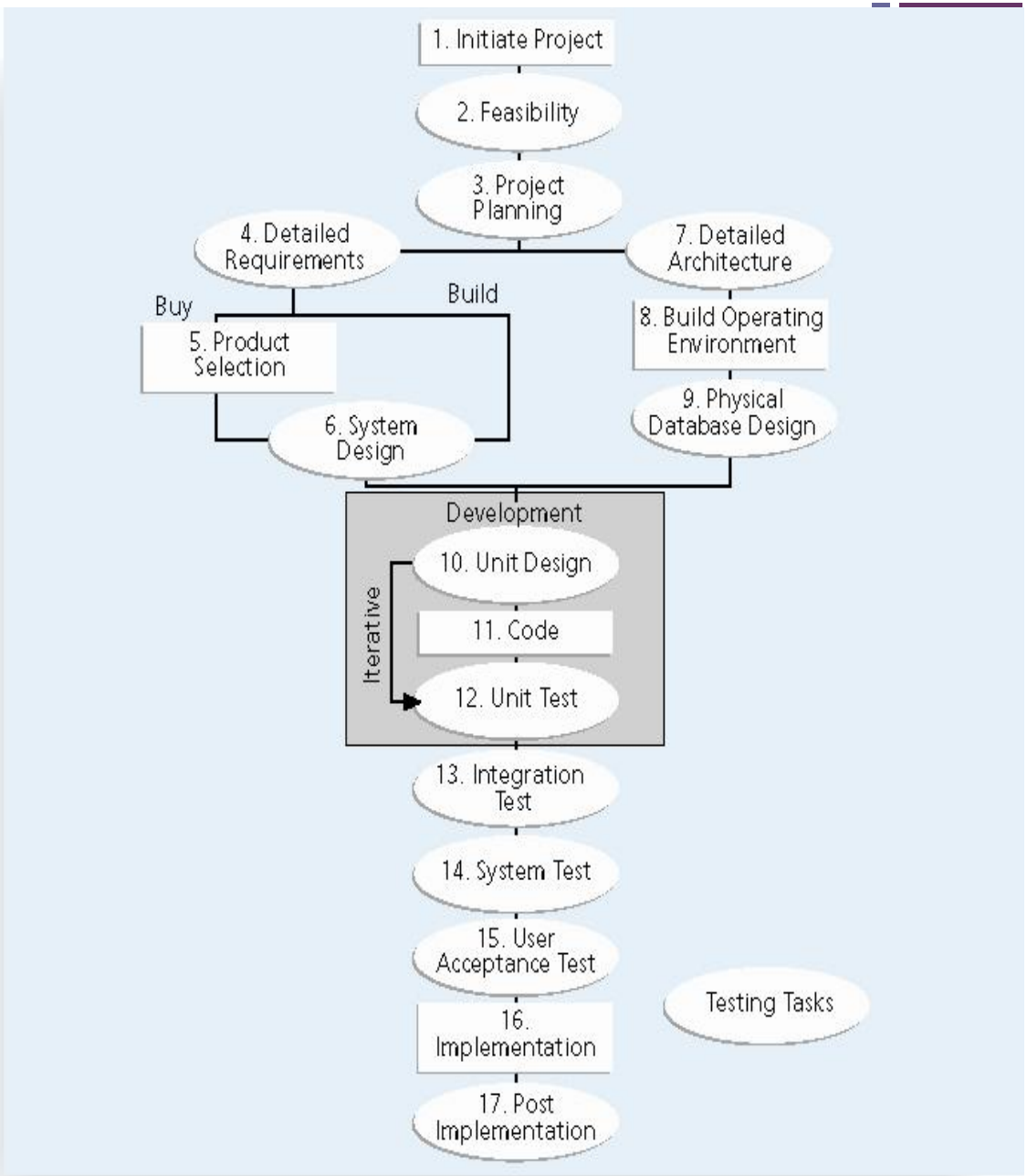
Sample Flowchart



Testing

- Many professionals think of testing as a stage that comes near the end of product development
- Testing should be done during almost every phase of the product development life cycle

Testing Tasks in the Software Development Life Cycle



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

Testing Alone Is Not Enough

- Watts S. Humphrey, a renowned expert on software quality, defines a software defect as anything that must be changed before delivery of the program
- Testing does not sufficiently prevent software defects because:
  - 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
- Humphrey suggests that people rethink the software development process to provide no potential defects when you enter system testing; developers must be responsible for providing error-free code at each stage of testing

ISO Standards

- ISO 9000 is a quality system standard that:
  - Is a three-part, continuous cycle of planning, controlling, and documenting quality in an organization
  - Provides minimum requirements needed for an organization to meet its quality certification standards
  - Helps organizations around the world reduce costs and improve customer satisfaction
- See www.iso.org for more information

The Cost of Quality

- The cost of quality is the 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
- A study reported that software bugs cost the U.S. economy $59.6 billion each year and that one third of the bugs could be eliminated by an improved testing infrastructure

Five Cost Categories Related to Quality

- Prevention cost: cost of planning and executing a project so it is error-free or within an acceptable error range
- Appraisal cost: cost of evaluating processes and their outputs to ensure quality
- Internal failure cost: cost incurred to correct an identified defect before the customer receives the product
- External failure cost: cost that relates to all errors not detected and corrected before delivery to the customer
- Measurement and test equipment costs: capital cost of equipment used to perform prevention and appraisal activities

Chapter Summary

- Project quality management ensures that the project will satisfy the needs for which it was undertaken
- Main processes include:
  - Plan quality
  - Perform quality assurance
  - Perform quality control

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Individual Work

Class Work

- A lecture review M.C.