CHAPTER 2
CUSTOMER-DRIVEN QUALITY AND SCHEDULING

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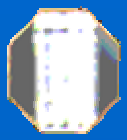
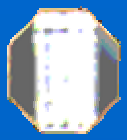
CEM – 515
Construction Quality Assurance

Focus



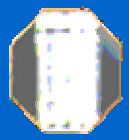
- The purpose of this chapter is to orient about the critical importance of scheduling as a practical quality tool and to point toward the useful and effective application of the quality tools covered.

Introduction



- The integration of project management and total quality makes sense, but there has not been much headway in putting these concepts into action.
- One reason is that project management is not seen as a planning tool rather, it is seen as a scheduling and action-oriented tool.
- Quality plans do not get translated into project schedules as easily as product specifications.

Introduction contd..



- Project managers typically see quality as an external aspect of the process different from and external to the core product design and development process

Introduction contd..

- The classic triumvirate of cost, schedule, and quality is not a triumvirate at all but rather three sides of the same quality concept.

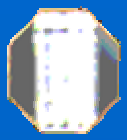
Introduction contd..

- There are two quality objectives
  - **Quality as conformance and**
  - **Quality as customer satisfaction.**

  Both must be achieved before the project can be considered successful.

- If quality as conformance can be measured and traced to specification and then scheduled into actions, then conformance is ensured.

Introduction contd..



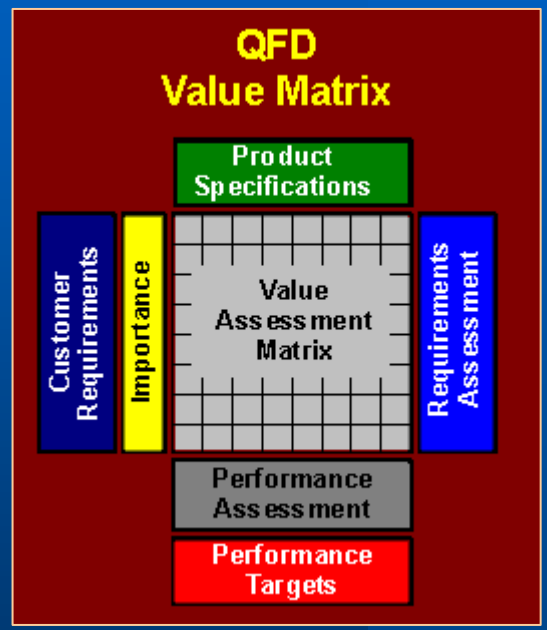
- "Quality as customer satisfaction" is relational rather than absolute and is a function of four key forces:
  - ***Expectations***
  - ***Feelings***
  - ***Feedback from stakeholders***
  - ***Project performance***

Tools

Key tools and techniques applied to project processes to ensure a quality product or service:

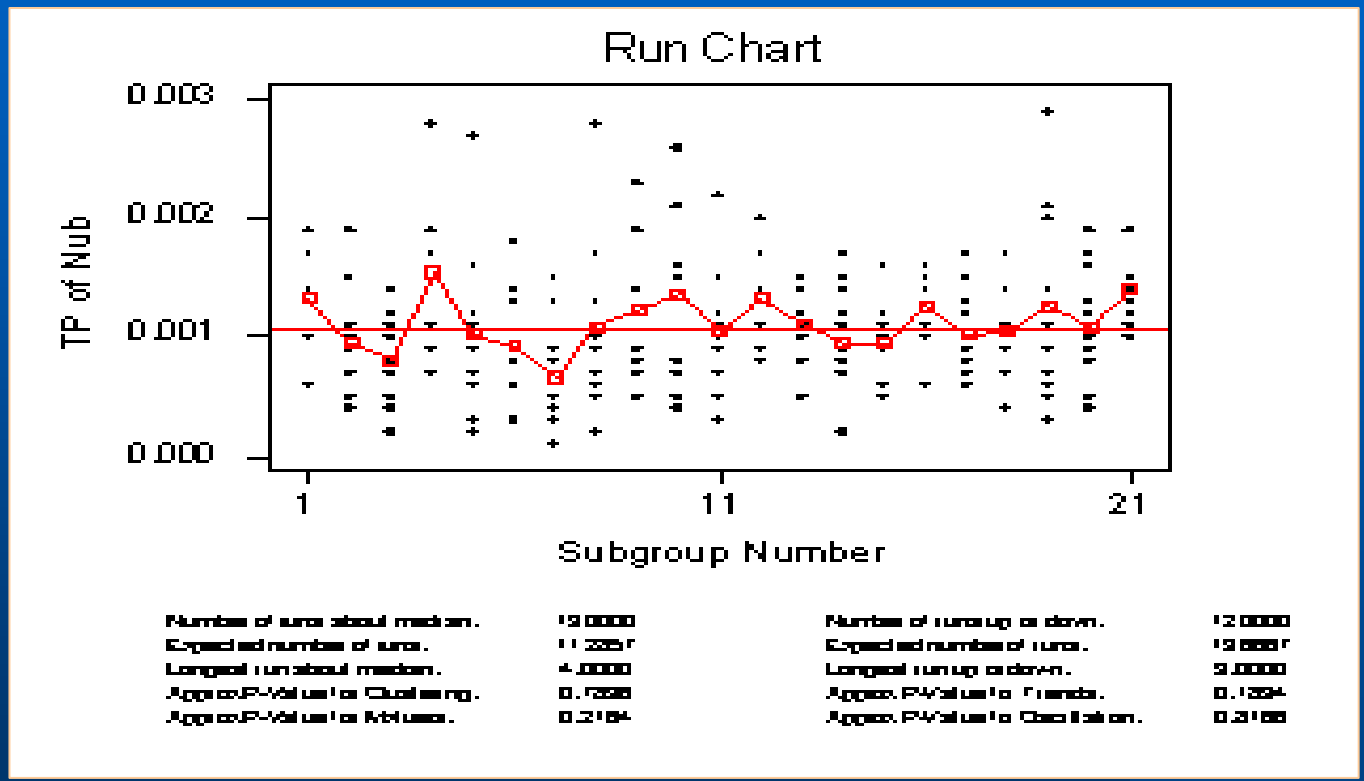
Quality function deployment (QFD)

"It is a translation of what to how".



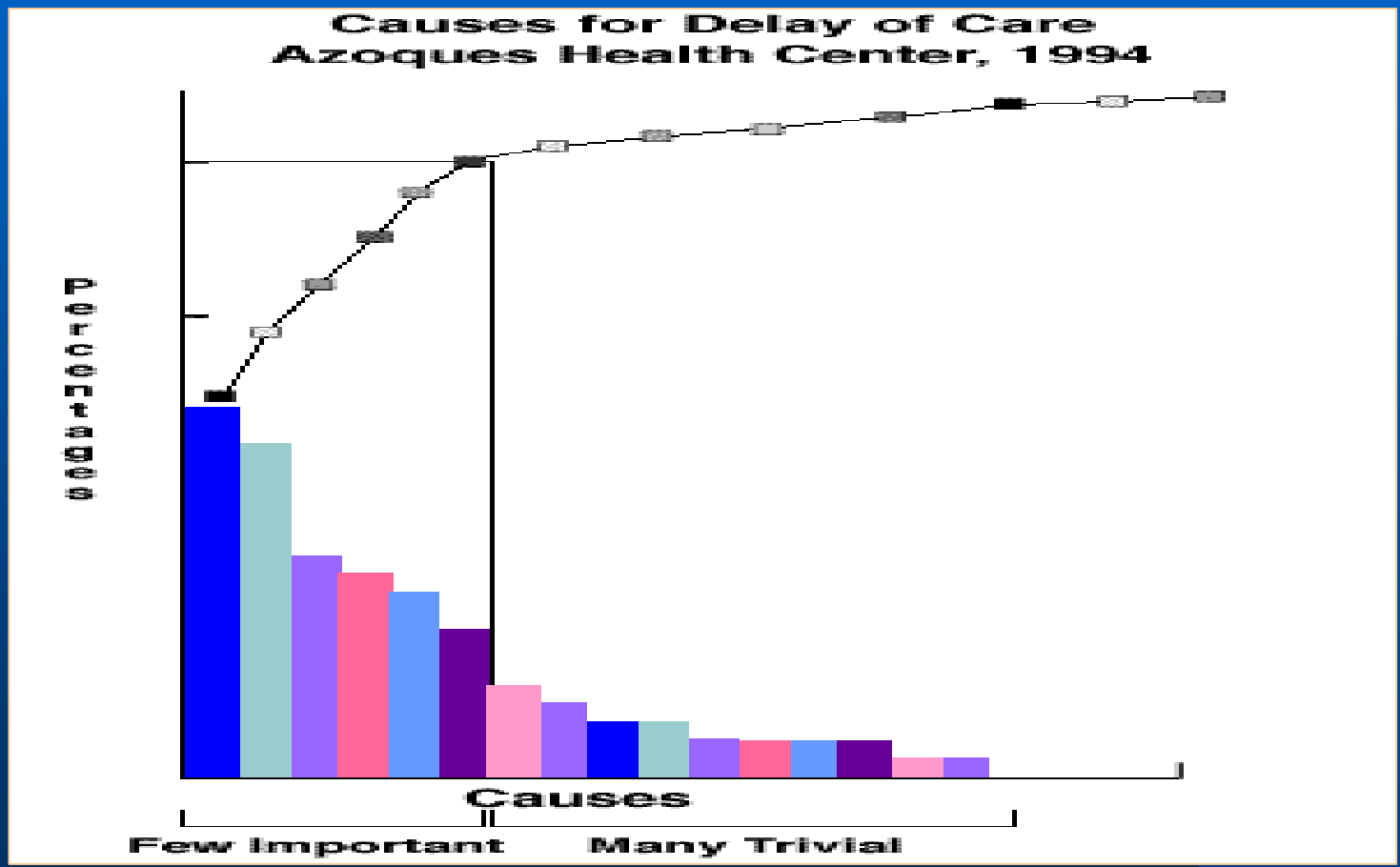
Tools contd..

Statistical process control (SPC):



Tools contd..

Pareto analysis



Tools contd..

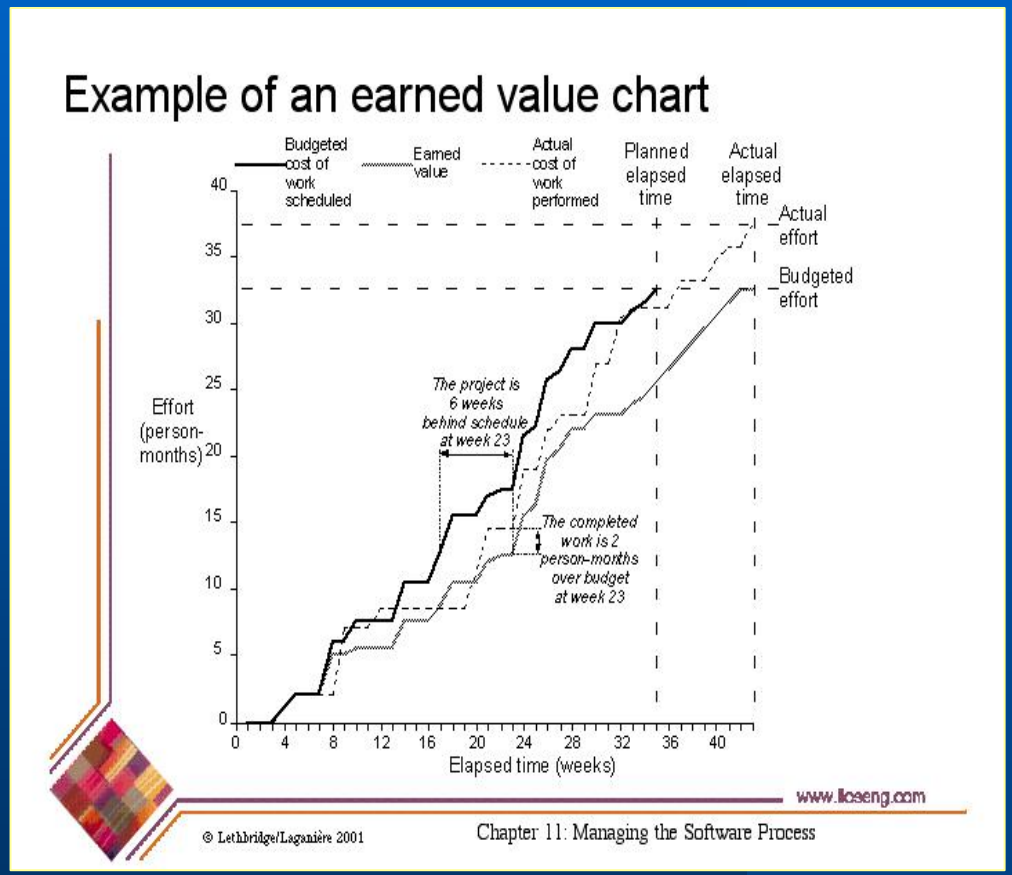
Cost-of-quality analysis

Quality assurance (QA):

Earned value:

Project review

Documentation



Scheduling as Team Motivator

- Team complacency is the enemy of quality; therefore, any strategy that addresses complacency will yield quality benefits in the project management process.
- If complacency is the enemy of quality, then *purpose* and *scheduling* are the enemy of complacency.
- The advantage of using scheduling is it refocuses individual work into the context of the team effort to continually remind team members of the inter-dependencies in their work.

Quality Is Scheduled

- There are fundamentally two basic ingredients to quality:
  - ***Conformance to specification or requirements, and***
  - ***Customer satisfaction***

  and one does not necessarily produce the other.
- *Conformance to specification* involves controlling the development of the deliverable so that it can be validated and verified.
- *Customer satisfaction*, on the other hand, is tied to customer expectations.

Quality Is Scheduled

- Customer satisfaction is a feeling, a perception, and a disposition that is based on the continuing relationship of project firm and customer/sponsor.

Quality Is Scheduled

- key points or windows where *quality as customer satisfaction* and *quality as conformance* can be expressed and integrated.

1. **Front-end customer process analysis**
2. **Concept development**
3. **Generation of alternative candidate projects**
4. **Scope of work**
5. **Scheduling**
6. **Budgeting and earned-value planning**
7. **Quality assurance**
8. **Project metrics**
9. **Prototyping**
10. **Quality audit**

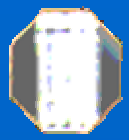
Front-end customer process analysis

- Projects typically go through five phases:
  - **Concept / Definition / Production / Operation and testing, and Closeout**
  - **Prior to the concept phase, there is a key step that ensures an understanding of the customer's business processes, work setting, and market forces.**
- This step is *front-end customer process analysis*

Tools and techniques

- process assessment, market analysis, discounting, weighted scoring models, and net present value analysis, and scheduling tools.

2. Concept development



- The initial concept phase involves the flushing out of alternative project ideas and opportunities after full immersion in the customer's key processes and product/service mix.

- A conceptual solution is an idea that shapes a need into a working vision.

Tools and techniques

- Concept development draws on quality function deployment (QFD) tools.

3. Generation of Alternative Candidate Projects

- To create ideas and options from free-flowing discussions in brainstorming sessions *and from current projects.*

Tools and techniques

- Alternative projects are compared through
  - **Net present value and**
  - **Weighted scoring models.**

4. Scope of Work

- The scope of work provides an effective window for emphasizing quality, but project scopes rarely include reference to quality management

Tools and techniques

- The scope template
- Project schedule
- Key milestones are referenced in the scope document.

5. Schedule

- Scheduling is accomplished by first developing a work break- down structure and then scheduling the tasks built into that structure.

Tools and techniques

- The basic tool of scheduling is a PM software package.
- Scheduling the scheduling task involves two key subtasks:
  - **Developing a preliminary schedule with resource assignments**
  - **Getting approval of the schedule from the customer, stakeholders, and project team**

6. Budgeting and Earned value

- *Earned value* is an indicator of how much work has been accomplished at any given time in the project that has earned its value.

Tools and techniques

- *Earned value* is a monitoring tool calculated automatically by any professional project management software if budget costs have been entered into the baseline schedule.

7. Quality Assurance

- *Quality assurance* is the process of building quality into the definition, design, production, and testing of the product deliverable.
- Quality assurance procedures provide for *testing*, *verifying*, and *validating* work as its progresses

Tools and techniques

- Quality assurance is implemented through a variety of statistical, testing, verifying, and validating procedures to ensure that work is done *right the first time*.

8. Project metrics

- Project plans and schedules typically include the application of set of *generic* and *tailored metrics*.

- *Generic metrics* include earned value, budget variance, and a wide variety of verification and validation measures. *Tailored measures* include indicators such as reliability that are unique to the deliverable.

Tools and techniques

- Metrics are tailored to the unique performance requirements of the product.

9. Prototyping

- Prototyping is the process of demonstrating an *early model* of the deliverable and how it will work without having made major investments in its design and development.

Tools and techniques

- Prototyping can be accomplished through electronic and visual representations, computer screens, models of products, and graphics.
- A prototype must be approved by the customer before proceeding.

10. Quality Audit

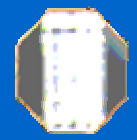
- The quality audit is a *postmortem review* of the project process to ensure that the experiences and documentation are captured and assessed for the purpose of improving future projects.

Tools and techniques

- Auditing tools are *document reviews*, *interviews*, and *internal control analyses* that ensure that planned procedures and practices were followed and that the project accomplished what it set out to accomplish.

Project Quality Management Principles:

The Backdrop to Scheduling



1. Transform customer expectations to requirements
2. Follow a defined development process and work breakdown structure (WBS), e.g. for a product development process, the basic structure is specified into 4 levels:

- **Stage: Customer requirements, concept development, detailed design, prototype development, design valid, product transition and manufacturing**
- **Phase: it is tailored to specific project phase features.**
- **Systems: how parts integrate with each other to produce product functionality**
- **Task : work packages are put together and achieved by individual or small team activity serving as the basis for design reviews.**

Project Quality Management Principles

3. Schedule customer and quality in early
4. Customer-driven teamwork
5. Define and communicate the scope of work and assignments clearly
6. Collaboration across the organization
7. Work will be quality-and schedule-driven
8. Ensure timely procurement of product components
9. Change is managed
10. Program progress will be tracked and periodically reviewed
11. Involve the customer in designing the project management support system

Quality as Driver

- Quality is the proper driver of project management and that quality tools and techniques must be built into the deliverable, not stamped on during inspection.

- Customer involvement is the best quality assurance mechanism and combines *two critical forces*:

  - **(1) Are the quality tools and metrics deployed in the project appropriate to the customer's needs?**

  - **(2) Does the development of the deliverable reflect the customer's changing views of a quality product?**

Project Planning

The project *Plan* must include at a minimum

- Overview of customer requirements
- Specifications derived from customer requirements
- Schedules
- Resource assignments
- Identification of test equipment /special tests
- Procurement requirements
- Manufacturing requirements
- Risk assessment and risk-mitigation plans

Project Planning

The project *Schedule* must include at a minimum

- Summary tasks and task structure and key milestones
- All product or service development activities
- Tasks detailed to the lowest practical level
- A central resource pool
- Resources assigned to activities and tasks

Departmental Manager Roles

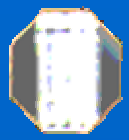
Some key functions of department managers:

- ⇨ Technical support and process improvement
- ⇨ Performance evaluation
- ⇨ Hiring, training, and career development plans
- ⇨ Development of a department budget
- ⇨ Preparation of a staffing plan
- ⇨ Assist project managers in bringing program schedules to baseline

Project Team Roles

- Each project team member is responsible for understa-nding his assigned tasks and interdependencies with other tasks and for general support to overall team performance.

Role of The Project Management Office



- The role of the project management office is to promote *best practices* and *consistency* in project management.

- The office provides administrative support to project managers and departments with scheduling, resource planning, and reporting services and activities.
- A key role is the analysis of all resource impacts to identify and resolve conflicts.

- The office assists in estimating costs, manages the project documentation process, and produces resource usage reports for all affected staff.

Scheduling

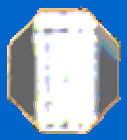
The project manager carries out the following basic scheduling procedures :

- Ensures that customer requirements, expectations, and needs are reflected in the project deliverable.
- Establishes project team "signoff“ of the schedule before base-lining
- Develops the top-level work breakdown structure
- Prepares a top-level schedule
- Integrates top-level tasks into a more detailed schedule contd…..

Scheduling

- "Scrubs" the schedule, involving four steps:
  - **Drafts an initial schedule**
  - **Works with department managers**
  - **Links the schedule into the central resource pool**
  - **Manages meetings with department managers and customers**
- Kicks off the project with team meeting
- Prepares summary presentation reports.

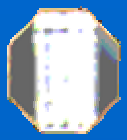
Base-lining the Schedule



Some rules of thumb for base-ining:

- The purpose is to get to a baseline schedule that captures all the work to be done.
- The baseline schedule is the agreed-on, schedule for the project, linked to the resource pool.
- The baseline schedule is resource-leveled.
- Getting to the schedule baseline involves collaboration between the project manager and all departments and staff involved, as well as the customer.

Schedules on a Network



- All baseline and planned schedules are housed on a server that can be accessed by the customer and the team.
- The project management department controls access to schedule files.
- The project management department is responsible for maintaining and updating program schedules on the network.

Resource Planning

- Good project management requires that there be a process to plan for future resources, to allocate current and projected resources to schedules, and to make shifts in resource management as required.

Long- Term Staff Planning

Involvement of the customer in long-term planning can help to build long-term relationships with the customer.

Preparing Staffing Policy and Plans

The planning process involves six steps:

- 1.Determine department staffing levels and assignments
- 2. Develop staffing/workload standards
- 3. Forecast future requirements
- 4. Develop department staffing requirements
- 5. Develop department staffing pattern
- 6. Prepare staffing plan

Schedule Review

- The manager of projects holds weekly schedule review meetings to discuss.

In support of program review, the project management office:

- Flags current and new issues for the week.
- Distributes assignments to staff and gathers feedback.
- Identifies conflicts and facilitates resolution.
- Provides weekly hard-copy updates of all schedules before program review meetings.

Main points

- This chapter explored a number of planning and scheduling issues in PQM and stress the importance of scheduling as the best assurance that good PQ planning is implemented.

- Scheduling is the process of reducing plans and requirements to tasks, thus completing the cycle from original customer expectations, through specifications, and then to work breakdown and scheduled tasks.

Main points

- Scheduling includes both time and cost, including scheduling and linking of tasks, assigning resources and costs to tasks, and integrating project monitoring through earned value.

- PQM scheduling requires that all quality tasks, tools, and techniques be specifically scheduled as tasks to ensure that they are performed