PLAN MANAGEMENT

Quality

At the COMDEX computer exposition, Bill Gates, the founder and CEO of Microsoft Corporation, stated: "If General Motors had kept up with technology like the computer industry has, we would all be driving $25 cars that got 1,000 miles to the gallon." In response to Gates' comments, General Motors issued a press release stating: "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.
- Macintosh would make a car that was powered by the sun, reliable, five times as fast, and twice as easy to drive, but would run on only five percent of the roads.
- New seats would force everyone to have the same size hips.
- 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."

QUALITY

- "the totality of characteristics of an entity that bear on its ability to satisfy stated or implied needs" (ISO8042:1994)
- "the degree to which a set of inherent characteristics fulfills requirements" (ISO9000:2000)
- **Conformance to requirements**: meeting written requirements
- **Fitness for use**: usability as was intended

Project Management Life Cycle

The purpose of project quality management is to ensure that the project will satisfy the needs for which it was undertaken.

Plan Quality Management

- identify quality requirements and/or standards for the project and its deliverables, and documenting how the project will demonstrate compliance with relevant quality requirements
- Output: quality management plan, quality metrics, quality checklists

Perform Quality Assurance

- audit the quality requirements and the results from quality control measurements to ensure that appropriate quality standards and operational definitions are used

Control Quality

- monitor and record results of executing the quality activities to assess performance and recommend necessary changes

PLAN QUALITY MANAGEMENT

Plan Quality Management

- Thrust is in the PREVENTION of defects
  - ✓Selecting proper materials
  - ✓Skills Training
  - ✓Indoctrinating quality
  - ✓Polishing processes
- Tool: Design of Experiments

Scope Aspects of Quality Software

- Functionality
  - degree to which a system performs its intended function
- System Outputs
  - the screens 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
- Maintainability
  - addresses the ease of performing maintenance on a product

CASE: PROJECT QUALITY PROGRAM

Case Review

- What was the premise of the case?
  - Konrad was asked to create a workshop for a local client specifically designed for project management tool
  - Konrad introduced Project Quality Program

Case Discussion

Project Quality Program

Pros	Cons
quality assurance tasks are directly tied to customer requirements	high dependency on inputs
defined responsibilities and timelines	will probably take a lot of time to accomplish

Case Discussion

Steps in creating the Project Quality Program

Steps	Inputs	Outputs
Identify quality standards	WBS, Quality Policy, customer requirement, scope statement	Each WBS element has corresponding quality standards
Identify quality assurance activities	Quality Standards, Quality Policy	Each quality standard is assigned specific quality assurance activity
Assign person-incharge	Quality Policy, Scope Statement, Team/QA Organization	Each Quality Assurance activity is assigned to a team member or QA specialist. The nature of work is identified.
Schedule QA activities	Project schedule, QA Activities	The activities are matched to work schedule

Figure 8.3 An Example of the Project Quality Program

PROJECT QUALITY PROGRAM

Project Name: SMP-1 **Rev:** 1

Prepared By: Bob Maxwell **Sheet:** 2 of 3 **Date:** May 10, 01

1	2	3	4	5						6						
WBS Code	**WBS Element**	**Quality Standard**	**Quality Assurance Task**	**Responsibility Matrix**						**Schedule May/June 2001 Week of**						
				Pete	Alan	Perry	Kim	DZM	Ian	5/7	5/14	5/21	5/28	6/4	6/14	6/21
2.03	Project Mgml Manual	Flesh reading ease	Run test and rewrite				D			▬	▬	▬				
		ISO 9000	Review	D	D	D							▬			
		PMBOK	Review					D						▬		
		Brevity guidelines	Check and correct				D								▬	
		Organization policy for writing manuals	Review	D					A							▬

Key: D-Do
A-Approve

- As project managers, what can we learn from the case?
  - What can go wrong, will go wrong. So, plan against it.
  - Involve stakeholders in quality planning.

PERFORMING QUALITY ASSURANCE

Quality Assurance

- Performing all of the activities related to satisfying the relevant quality standards for a project
- Periodically evaluating overall project performance to ensure that the project will satisfy the relevant quality standards: **Quality Audit**
  - structured review of specific quality management activities that help identify lessons learned and that could improve performance on current or future projects
- Continuous quality improvement:
  - **kaizen:** change for the better
  - **lean:** evaluating processes to maximize customer value while minimizing waste

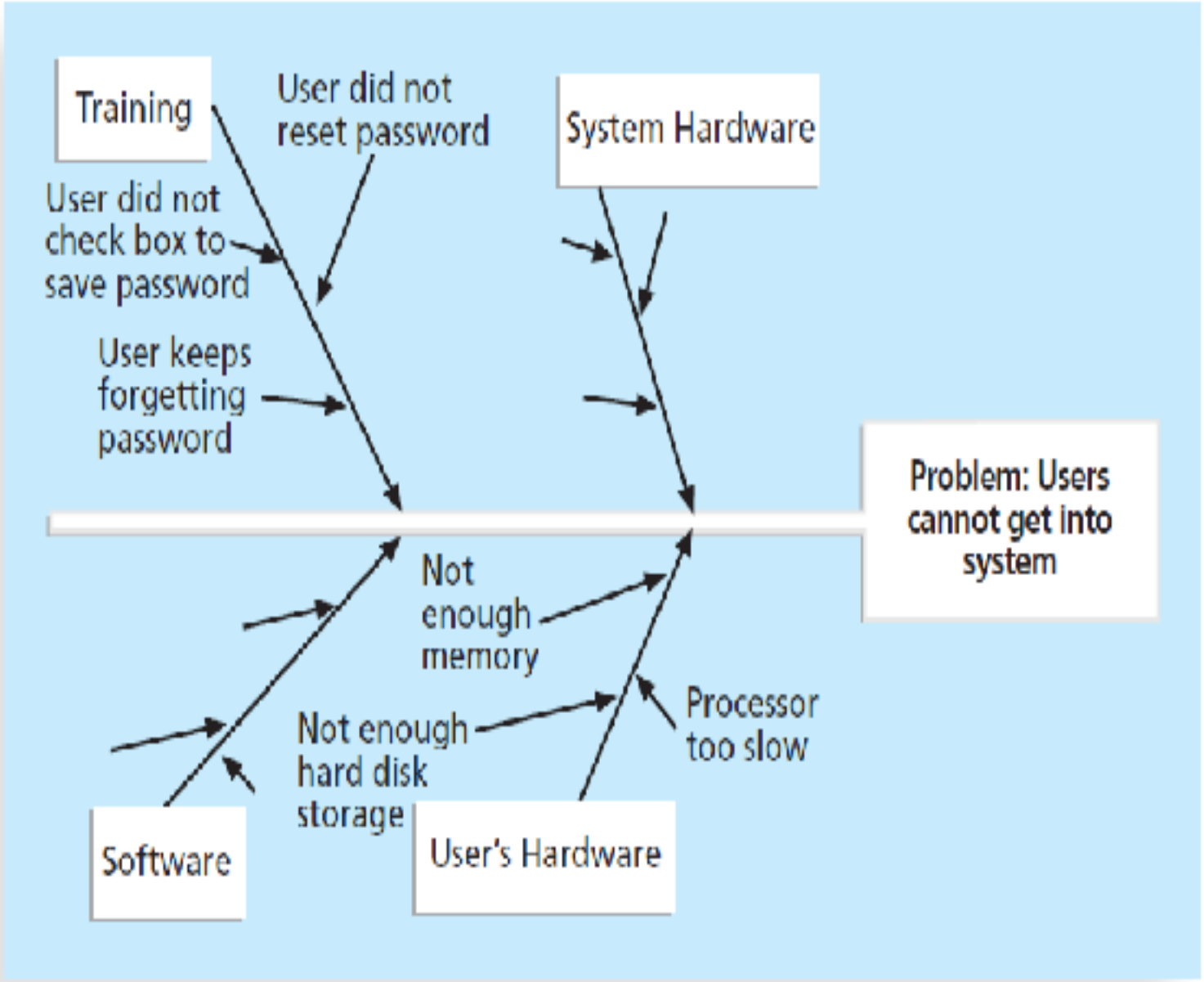
QUALITY CONTROL

Quality Control

- Acceptance Decisions
  - determine if the products or services produced as part of the project will be accepted or rejected
- Rework
  - action taken to bring rejected items into compliance with product requirements, specifications, or other stakeholder expectations
  - very expensive, therefore good quality planning and quality assurance must be put in place
- Process Adjustments
  - correct or prevent further quality problems based on quality control measurements

QC Tools

- Cause and Effect Diagram
  - help you find the root cause of the problem
  - repeatedly ask the question, Why?



CASE: ROBOTS FAIL TOO

Case Review

- What was the problem experienced by Lisa, Manufacturing Engineer at IEM Company?
  - IEM was upgrading their tools and two robots used during the upgrade failed after two weeks of working fine
- How did Lisa solved the problem?
  - The machines were sent back to the supplier for investigation
- Was Lisa's recommendation helpful?
  - No, because in the first place they are not sure whether the problem was really caused by the robots and several robots have already started to break down.

Case Discussion

- What was Lisa's mistake in managing the upgrade project's robot problem?
  - underestimated the value of troubleshooting/testing; thought that they don't have the time for it (before using the robot and when the error occurred

Case Discussion

- What were the steps Lisa and the team took to perform quality testing of the robot?
  - goal definition
  - root cause analysis
    - brainstorming using affinity diagram method
    - root cause analysis using fishbone diagram
    - test plan
  - countermeasures identification
  - standardization

Case Discussion

- What can be done to improve the process that she's using?
  - ask technicians to review test plan
  - add expected results in the test tool
- As a project manager, what can we learn from the case?
  - the value of quality assurance: robots should have been tested before utilization in the project. robots fail too, you know.
  - understand the situation before any form of control is done

QC Tools

- Control Charts
  - graphic display of data that illustrates the results of a process over time
  - identify the cause of variations due to nonrandom events
  - apply seven run rule to detect anomalies

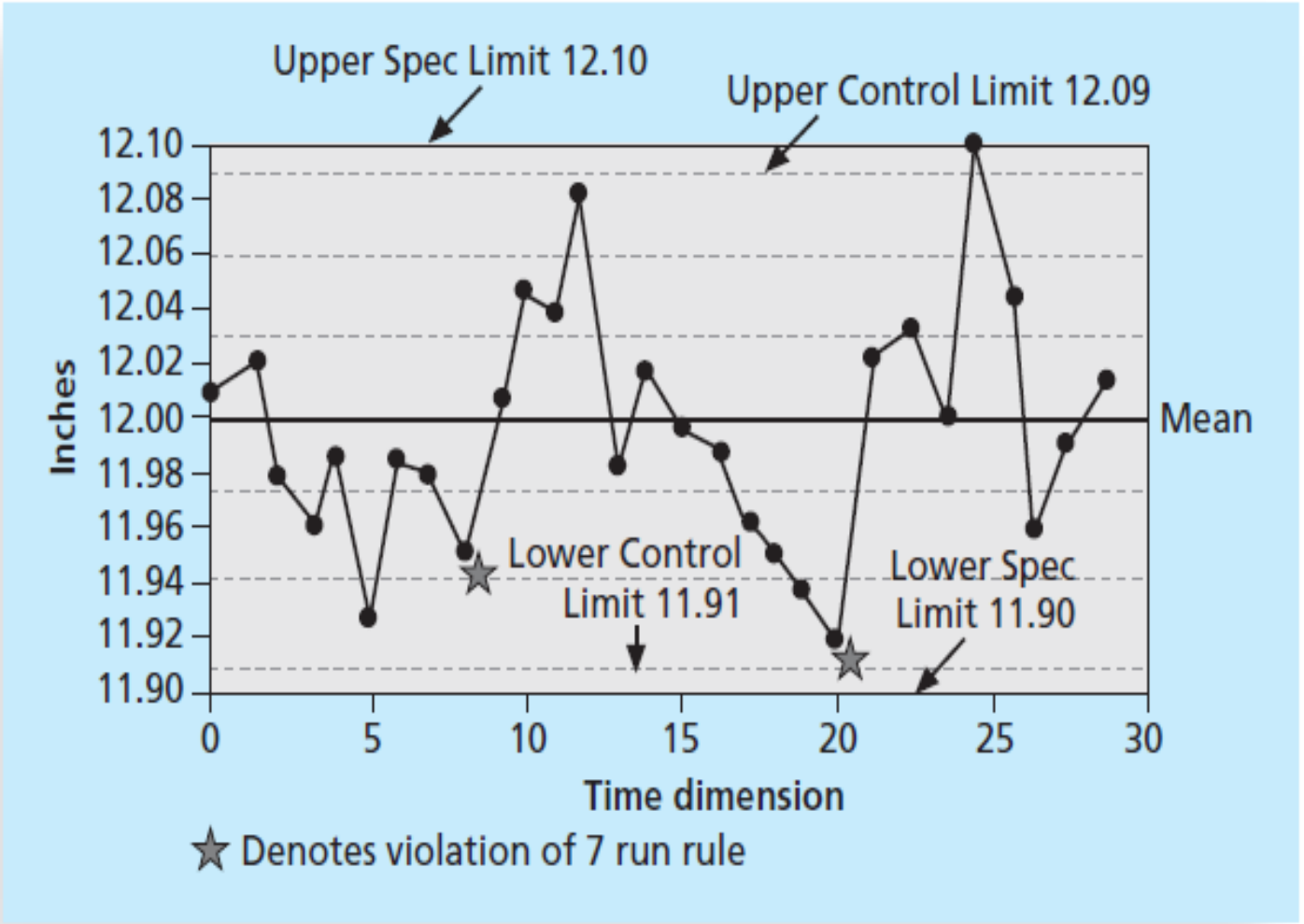


FIGURE 8-3 Sample control chart

QC Tools

- Checksheets (tally sheets)
  - used to organize facts in a manner that will facilitate the effective collection of useful data about a potential quality problem

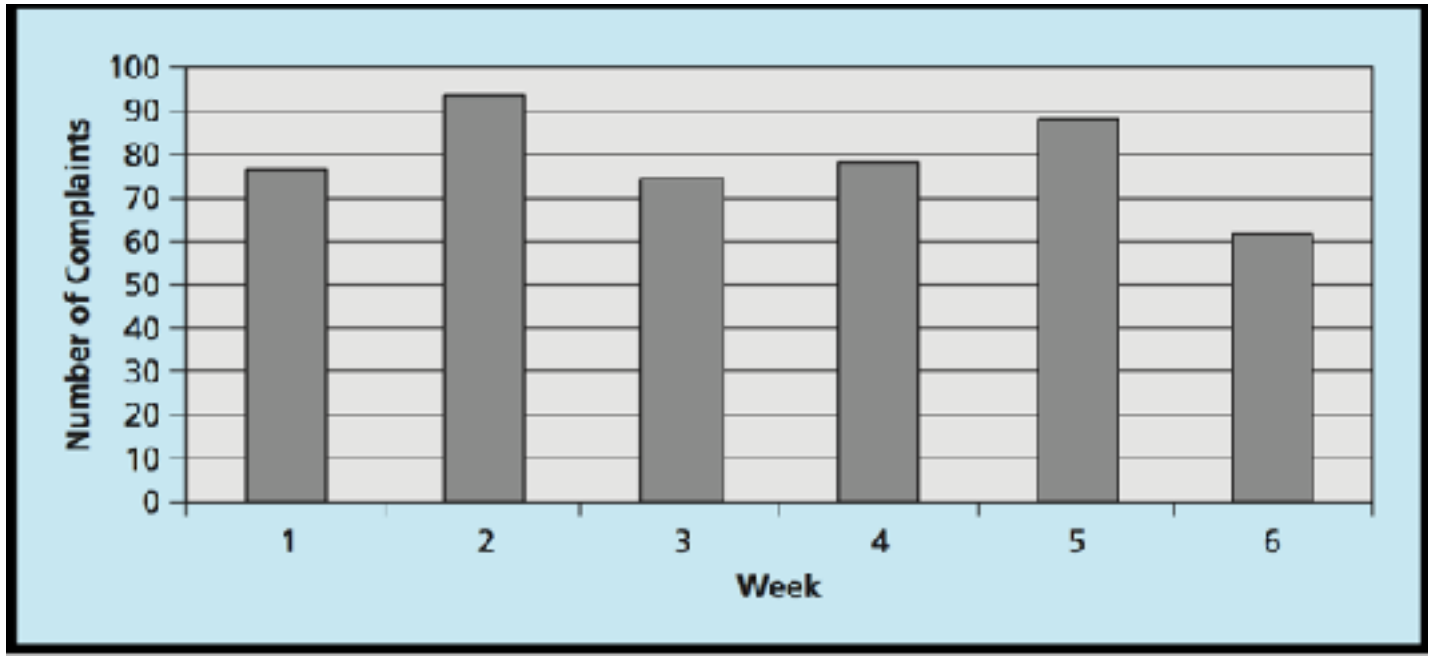
System Complaints

Source	Day							
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Total
Email	𝍸 ||	𝍸 ||||	𝍸 |	𝍸 ||	𝍸 |		𝍸 |	12
Text	𝍸 ||	𝍸 ||||	𝍸 |	𝍸 |||	𝍸 ||||	𝍸 ||	𝍸 |||	29
Phone call	|	𝍸 ||	|	|	𝍸 ||	|		8
Total	11	10	8	6	7	3	4	49

FIGURE 8-4 Sample checksheet

QC Tools

- Histogram
  - a bar graph of a distribution of variables.
  - each bar represents an attribute or characteristic of a problem or situation
  - the height of the bar represents its frequency



QC Tools

- Scatter Diagram
  - helps to show if there is a relationship between two variables

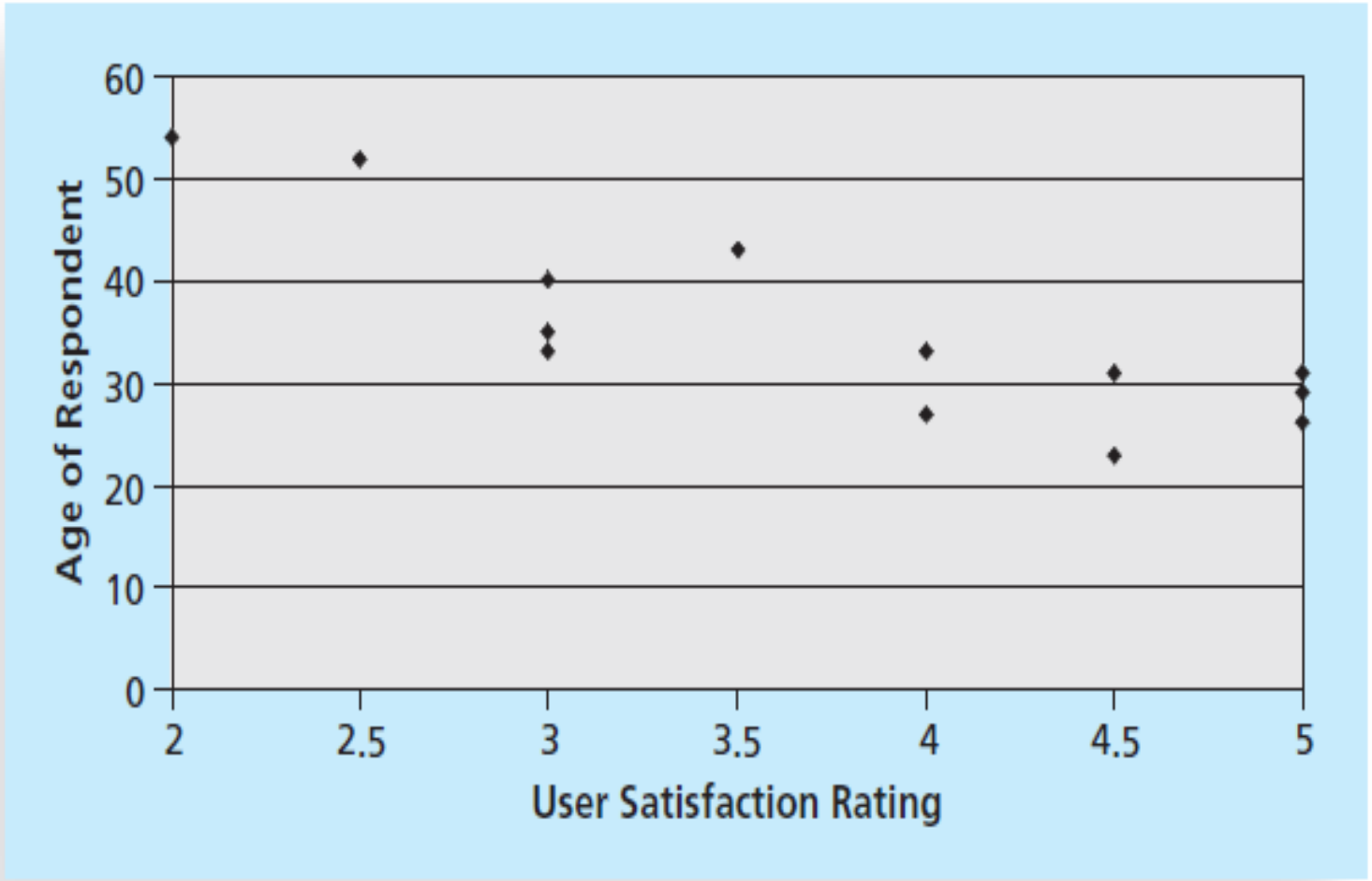


FIGURE 8-5 Sample scatter diagram

QC Tools

- Pareto Chart
  - histogram that can help you identify and prioritize problem areas
  - 80-20 rule (pareto analysis): 80 percent of problems are often due to 20 percent of the causes

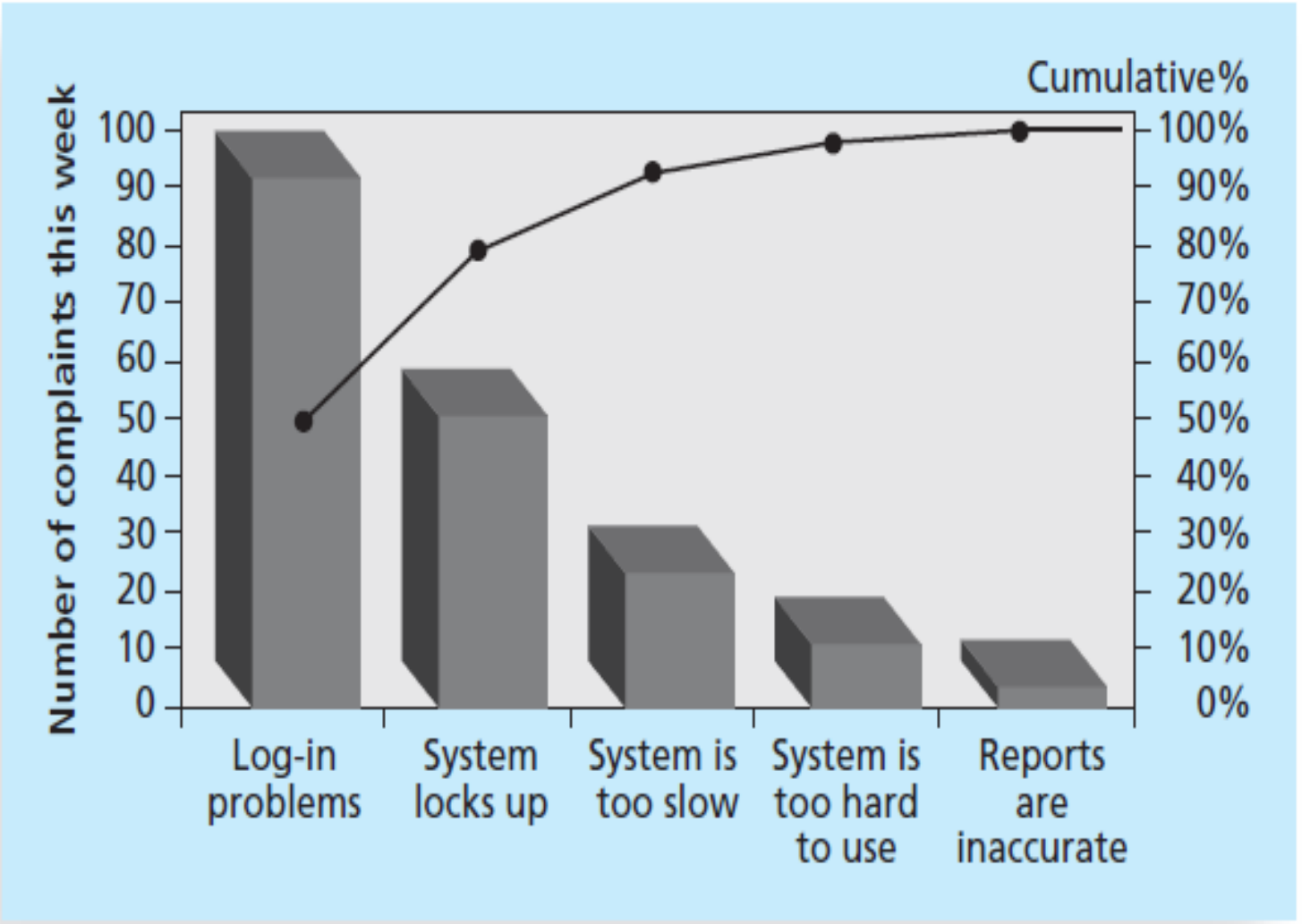
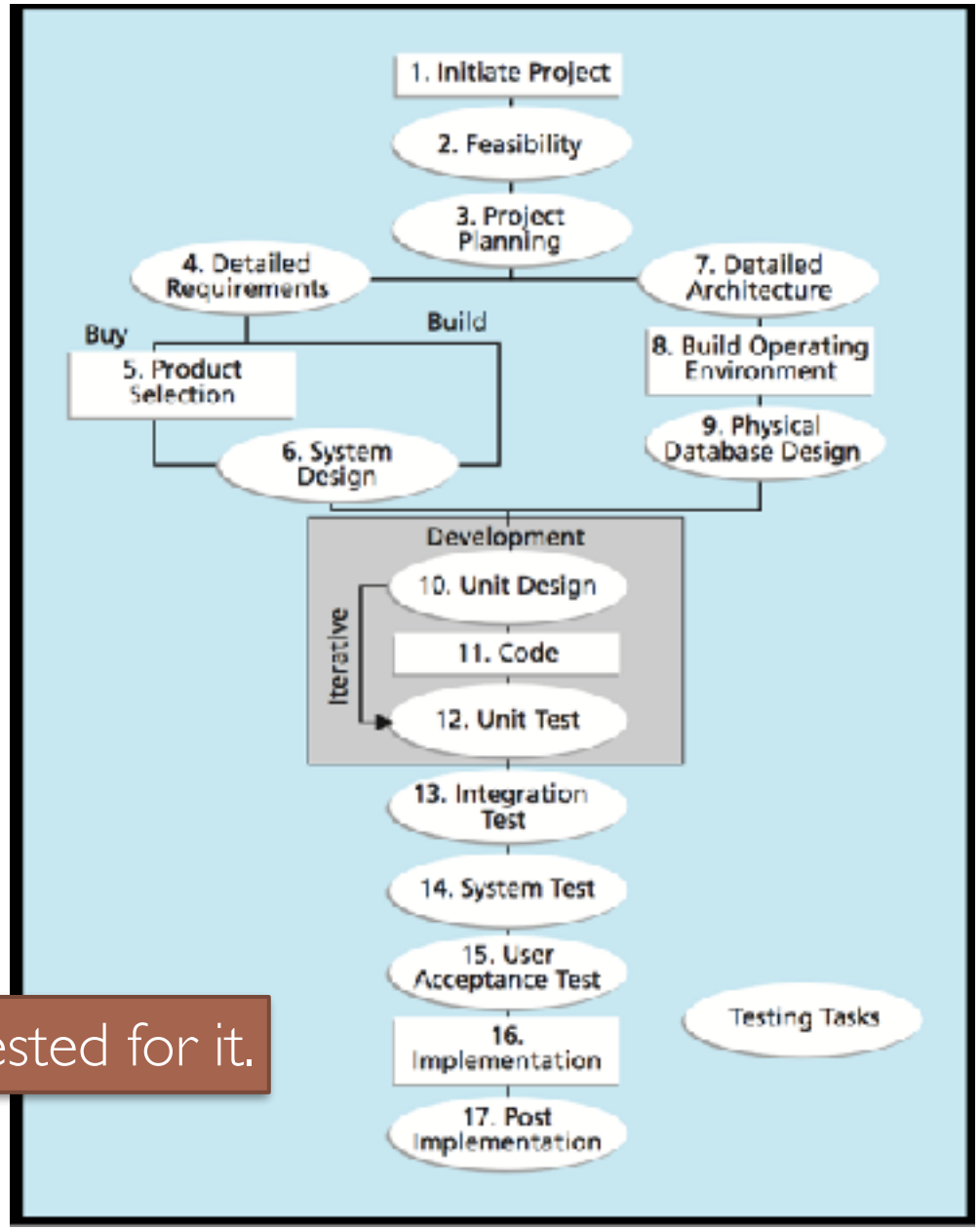


FIGURE 8-7 Sample Pareto chart

Testing for Quality

- testing is seen as the last bastion for ensuring quality in IT products
- project managers should not depend on testing alone
- establish thorough and disciplined testing methodology



Quality must be built into the product and not tested for it.

- code-test-fix cycle for software development is no longer enough
- as code gets more complex, the number of defects missed by testing increases
  - programmers introduce a defect for every nine or 10 lines of code
  - finished software, after all testing, contains about five to six defects per thousand lines of code
- testing does not sufficiently prevent software defects
- **rethink the software development process** to provide no potential defects when you enter system testing