ITMD 536 Software Testing & Maintenance

Chapter 13, 14, 15 & 16
Major Update,
When to Retire the System,
Future Shock, An Action Plan & Winning the Battles for Prestige, Resources & Recognition

Objectives

- What is real options concepts?
- What is feasibility study?
- What is concept benefits trade-offs?
- What are cost-effectiveness analysis?
- What are other techniques?
- What are death spirals?
- What are retirement plans?

Objectives

- What are development options?
- What is cutover?
- What are you looking into the future?
- What are the development technologies?
- What are the technology readiness levels?

Objectives

- What is lean manufacturing (KANBAN)?
- How can users be maintainers?
- What is could computing and its impact?
- How can you play to win?
- How can you develop your support base?

Objectives

- How can you win the battle of the budget?
- How can you keep the users involved?
- How can you deliver exceptional products and services?
- How can you be successful?

What is Enhancement?

- Refers to added capabilities to an existing capability in a manner that preserves the previous functionality and performance.

What is Retirement?

- Permanent removal of support or of the product from operations.
- Retirement phase is the period of time in the software life cycle during which support for a software product is terminated.

13 Being Ready for the Next Major Upgrade

- **13.1 Real Option Concepts**
- Justification for change must first make technical sense within the context of the upgrade. They must also have a champion. Someone needs to stand up and say that the change being proposed is important. The timeliness for change also need to be compatible.

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- Your request will not be approved if it slows down things like a major upgrade.
- Most important, the change must generate benefits that justify the costs.
- Real options analysis permits alternatives in such a case to be

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- Evaluated taking risk into account using the following six-step approach:
- *Step 1. Assessment:* You would conduct a basic financial analysis in terms of the cost and benefits associated with the software being considered as a COSTS replacement.
- Uncertainties would be identified

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- Along with their likely impacts relative to user satisfaction, which is considered the main factor that governs selection among the alternatives.
- *Step 2. Risk Determination:* you would investigate the risks and quantify the uncertainties associated

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- With requirements and performs capabilities and capacities in monetary terms.
- *Step 3. Options Analysis:* as your next step, you would identify real options that address the risks associated with the software investments being considered.

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- You can consider option to paying the COTS vendor to add features or of course there are yet other options that might be pursued, like providing needed features via plug-in modules or confirming that the user is all right with abandoning the requirements.

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- *Step 4 – Options Valuation:* The next step is to value the options using the information you have at your disposal. You can do this simply by computing costs. Take the ranges of uncertainty and this will help bound the risk involved with the options.

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- *Step 5 – Investment Valuation:* It sounds like a lot of work to come up with a valuation of options. You take the numbers, compare them, and make a decision.
- *Step 6 – Execution:* The last step assumes that the decision makers are smart enough to execute the real

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- Options when it is in their best interests to do so. The real options provide them with an advantage because they provide the means to address risk in their decisions. Uncertainties associated with software purchasing decisions sometimes lead to unnecessary risks

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- That often can be prevented.
- You now have a strategy, support, paperwork, and justification in hand to push ahead with changes that you are going to recommend be made along with the next major upgrade.

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- **13.2 Feasibility Studies**
- The traditional thing that you would do when addressing a major upgrade is perform a feasibility study. Such a study is done ultimately to develop a plan of action and milestones for performing the major upgrade with minimum disruption and at

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- Minimum cost during the scheduled time period.
- The following feasibility study plan outline – report needs to be completed but you may omit that do not apply.
- ***Feasibility study plan outline:***

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- 1. Executive summary
- 2. Background and needs assessment
  - 2.1 System/software overview
  - 2.2 Upgrade overview
  - 2.3 Needs assessment
  - 2.4 Statutory requirements
- 3. Organizational impacts

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  - ■ 3.1 Organizational involved
  - ■ 3.2 Operational environment
  - ■ 3.3 Maintenance environment
  - ■ 3.4 Points of contact
- ► 4. Proposed solution
  - ■ 4.1 Specific work products
  - ■ 4.2 Major features/functions to be added
  - ■ 4.3 Repairs to be made

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  - 4.4 New business processes that need to be supported
  - 4.5 Facility and equipment upgrades
- 5. Major options considered
- 6. Conformity with information technology (IT) portfolio
  - 6.1 Strategic impact on business or IT goals

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  - 6.2 Technology impacts
- 7. Project management impacts
  - 7.1 Roles and responsibilities
  - 7.2 Project team organization and leadership
- 8. Sustaining engineering impacts
  - 8.1 User support
  - 8.2 Field service support

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- 9. Facility impacts
- 10. Operational impacts
    - 10.1 Dual/parallel operations plans
    - 10.2 Information security plans
- 11. Estimated timeline and work plan
- 12. Cost-benefit analysis

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- You should make a compelling technical and business case for the change.
- Timing is strategy. Make sure your results are available in time to influence the decision and get funded.

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Cost-Benefit Trade-Offs

▶ *Nonrecurring costs*: Tangible Benefits

▶ License fees, Cost avoidance

▶ Tailoring Cost, Avoid development cost

▶ Integration cost, Tailoring part of

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Cost-Benefit Trade-Offs

► *Recurring costs (5yrs)*:	Tangible Benefits
► License fees,	Immediate availability
► Maintenance,	fewer bugs
► Training fee,	Someone else handles updates

13 Being Ready for the Next Major Upgrade

- Anticipate that a major system/software upgrade will occur every five/seven years
- Piggy-back other work that needs to be updated as it’s needed
- Readiness in most important not just resources but the budget
- Change is inevitable – be ready for it

14 Knowing When to Retire the System

- Death Spirals – know when to retire the system
- Retirement Plans:
  - High cost and maintenance issues
  - Poor quality
  - Capabilities of the system are no longer needed
  - High cost for upgrades
  - Technology not supported

14 Knowing When to Retire the System

- Development options
  - Architecture needs
  - Data migration needs
  - Knowledge needs
  - Legacy reengineering needs
  - Process reengineering needs
  - Readiness needs

14 Knowing When to Retire the System

- Cutover
  - Personnel
  - Equipment
  - Architecture
  - Processes
  - Facilities
  - Databases
  - Knowledge
  - Infrastructure
  - Legacy

15 Future Shock – An Action Plan

Looking to the Future

- Agile methods
- Cloud computing
- Grid computing
- Intelligent databases
- Lean manufacturing (Kanban)
- Predictive analysis
- Semantic Web
- Service-oriented architecture

15 Future Shock – An Action Plan

Looking to the Future

- Software as a service
- Storage virtualization
- Utility computing (pay-as-you-go)
- Users as programmers

15 Future Shock – An Action Plan

- **Technology Readiness Level (TRL)**
  - Basic principles observed and reported
  - Technology concept or application formulated
  - Analytical experimental proof of concept
  - Validation in laboratory environment
  - Validation in relevant environment

15 Future Shock – An Action Plan

- **Technology Readiness Level (TRL)**
  - Prototype demonstration in a relevant environment
  - System prototype demonstration in a operational environment
  - Actual system completed using technology and tested in its operational environment
  - Actual system that uses technology taken through successful operations

15 Future Shock – An Action Plan

- **Lean Manufacturing (KANBAN)**
  - Overproduction
  - Transportation
  - Waiting
  - Motion
  - Defects
  - Processing
  - Inventory

16 Winning the Battles for Prestige, Resources, and Recognition

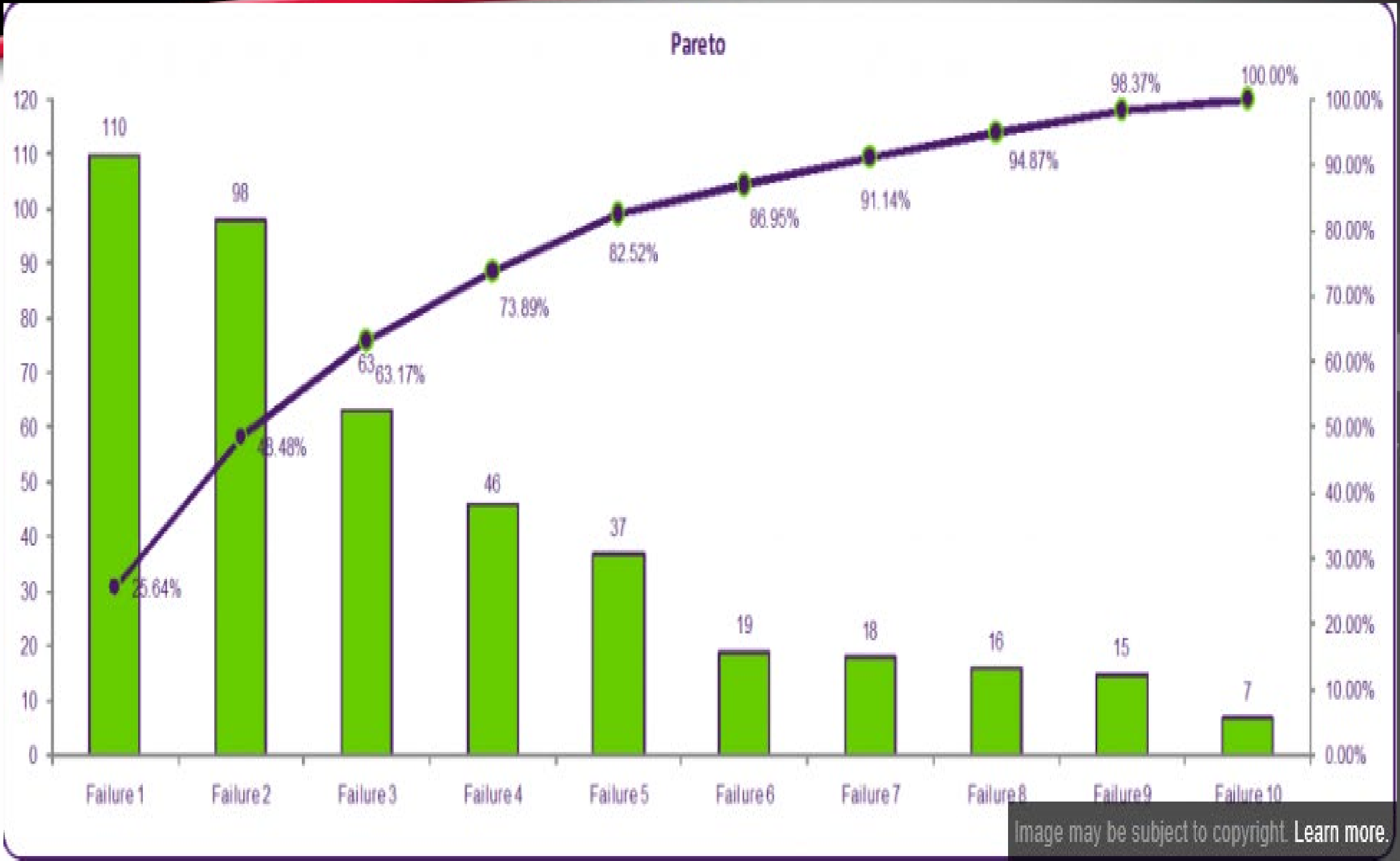
- "Life's battles don't always go the stronger or faster man. But sooner or later the man who wins, is the one that thinks he can." *Vince Lombardi*
- Planning to Win
- Developing Your Support Base
- Winning the Battle of the Budget

16 Winning the Battles for Prestige, Resources, and Recognition

- “Keeping the Users Involved
- Delivering Exceptional Products and Services
- You can be Successful
  - Do what is needed and nothing else
  - Focus on the things that really matter
  - Recognize that your resources are limited

16 Winning the Battles for Prestige, Resources, and Recognition

- Get everyone involved, but not too involved
- Focus changes on both product-and processes related improvement
- Do the essential things first to maintain your credibility
- Be satisfied with a 90 percent solution



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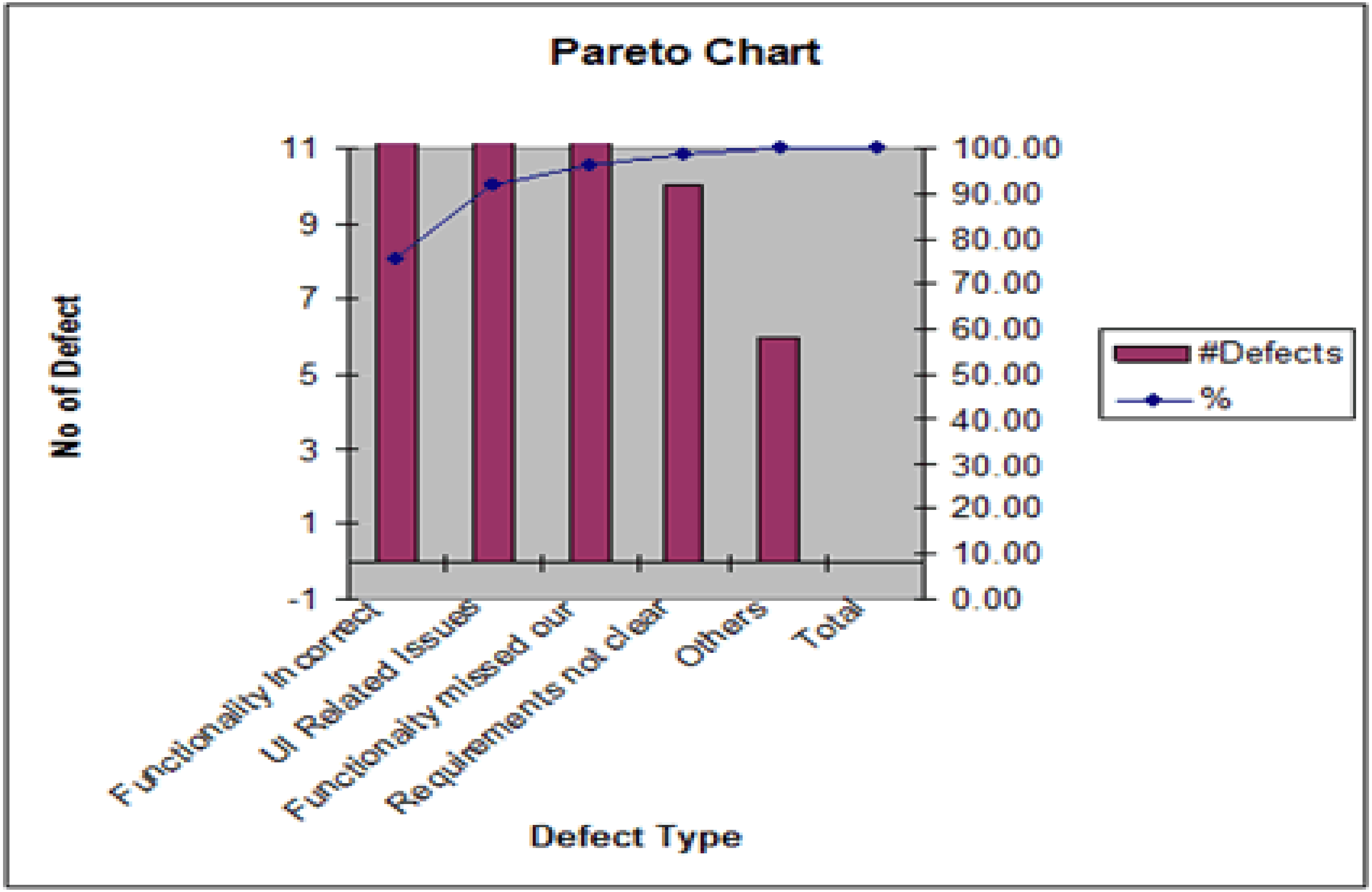
Pareto Chart
No of Defect
11
9
7
5
3
1
-1
100.00
90.00
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
#Defects
%
Functionality In correct
UI Related Issues
Functionality missed out
Requirements not clear
Others
Total
Defect Type

Final Exam Group Project

Final Exam

Group Project Presentation

December 1st and 8th

10:00 to 12:40 PM