Lecture 11: Managing Your Project

The task of Management

Planning the project

- Task breakdown
- Pert Charts, Gantt Charts

Measuring Progress

- Burndown charts
- Test Progress Charts

Use of meetings

Starting point

You have a prioritized list of tasks

- …entered into the tracking system
- …each task has an effort estimate

You have selected which tasks go into the release

- "Iceberg list": top n items in this release
- additional requests from customer push other items below the waterline
- faster than expected progress lifts items up above the waterline

Problem:

- How do we keep the project on track?

Management Duties

Analyzing and Controlling Risk

Liaising with customer

Defining lines of communication

Recruiting and training project team

Create project plan, schedule, cost estimate,…

Assign tasks

Measure progress of project

Make sure appropriate tools and techniques are used

Keep project on track, take action if it slips

Ensure contractual obligations met

Ensure appropriate standards are met

Ensure lessons learned are captured and used

Refresher: project control

A manager can control 4 things:

Resources (can get more dollars, facilities, personnel)

Time (can increase schedule, delay milestones, etc.)

Product (can reduce functionality - e.g. scrub requirements)

Risk (can decide which risks are acceptable)

To do this, a manager needs to keep track of:

Effort - How much effort will be needed? How much has been expended?

Time - What is the expected schedule? How far are we deviating from it?

Size - How big is the planned system? How much have we built?

Defects - How many errors are we making? How many are we detecting?

And how do these errors impact quality?

Initially, a manager needs good estimates

…and these can only come from a thorough analysis of the problem.

You cannot control that which you cannot measure!

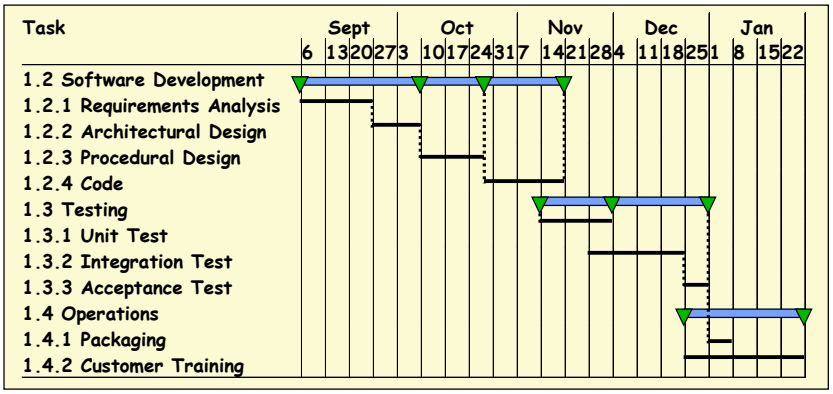
Tool 1: Work Breakdown Structure

Source: *Adapted from Blum, 1992, p438*
see also: *van Vliet pp192-3*

- 1.1 Software Systems Engineering
  - 1.1.1 Support to Systems Engineering
  - 1.1.2 Support to Hardware Engineering
  - 1.1.3 Software Engineering Trade Studies
  - 1.1.4 System Requirements Analysis
  - 1.1.5 Software Requirements Analysis
  - 1.1.6 Interface Analysis
  - 1.1.7 Support to Systems Test
- 1.2 Software Development
  - 1.2.1 Deliverable Software
  - 1.2.1.1 Requirements Analysis
  - 1.2.1.2 Architectural Design
  - 1.2.1.3 Procedural Design
  - 1.2.1.4 Code
  - 1.2.1.5 Unit Test
  - 1.2.1.6 Software Integration Test
  - 1.2.1.7 Technical Reviews
  - 1.2.1.8 Technical Training
  - 1.2.2 Non-deliverable Software
  - 1.2.3 Purchased Software
  - 1.2.3.1 Package Evaluation
  - 1.2.4 Development facilities and tools
- 1.3 Software Test and Evaluation
  - 1.3.1 Software Dev. Test & Evaluation
  - 1.3.2 End-Product Acceptance Test
  - 1.3.3 Test Bed & Tool Support
  - 1.3.4 Test Data Management
- 1.4 Management
  - 1.4.1 Project Management
  - 1.4.2 Administrative Support
  - 1.4.3 Management Tools
  - 1.4.4 Management Reviews
  - 1.4.5 Management Training
- 1.5 Product Assurance
  - 1.5.1 Configuration Management
  - 1.5.2 Library Operations
  - 1.5.3 Interface Control
  - 1.5.4 Data Management
  - 1.5.5 Quality Assurance
  - 1.5.6 Quality Control
- 1.6 Operations and Support
  - ...

see also: *van Vliet pp195-6*

Tool 2: Gantt Charts



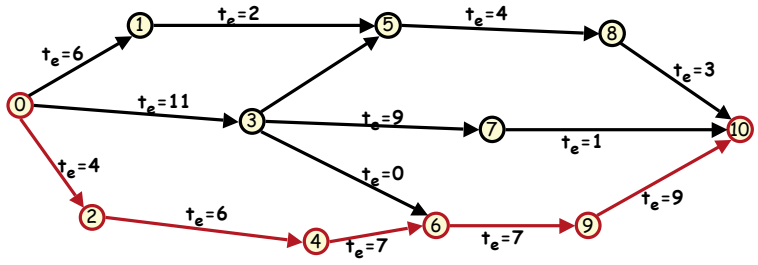
Notation

- Bars show duration of tasks
- Triangles show milestones
- Vertical dashed lines show dependencies

Shows high level view of whole project

Tool 3: PERT charts

Source: Adapted from Blum, 1992, p439
see also: van Vliet pp193-6



→ Notation

- Nodes indicate milestones
- Edges indicate dependencies
- Edges are labelled with time to complete

→ Shows Critical Path

- Longest path from start to finish
- any slippage on the critical path will cause project delay

Avoiding Gantt Charts?

Source: Adapted from Rosenberg's ICONIX book, p182

Gantt charts can be misleading

- "% complete" for most tasks is valueless
- poorly defined completeness criteria for each task

High level mangement view:

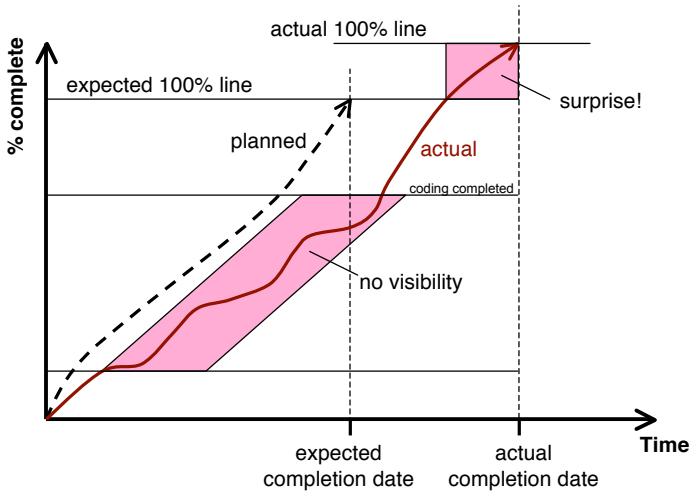
- Is the project on track?
- Is the next release going to be late?
- What will be in the next release?
- Has anything slipped to the following release?

Risk-based planning:

- What can go wrong?
- What are the consequences of not knowing that they are going wrong?

Measuring Progress

Source: Adapted from Cockburn, "Crystal Clear"



Agile Approach

Measure progress of small tasks

- Reduces regions of no visibility
- Use the issue tracking system!

Estimate effort for each task

- adjust estimate of remaining effort as iteration progresses

Only working code counts

- Task complete only when it delivers tested, working code
- *(okay, training material, manuals, etc also count - but nothing else!)*

Visualize Progress

- E.g. use a burndown chart

Use your experience!

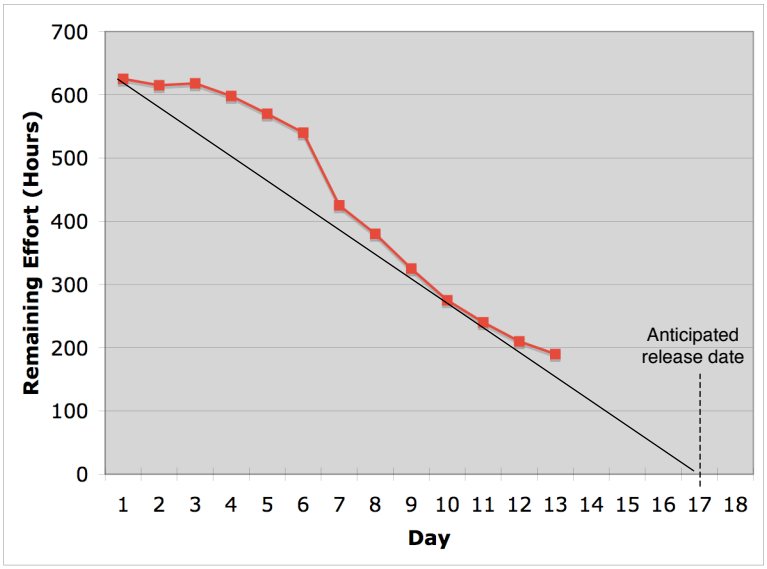
- E.g. if estimates are out on this iteration, adjust estimates for the next

Maintain a task list

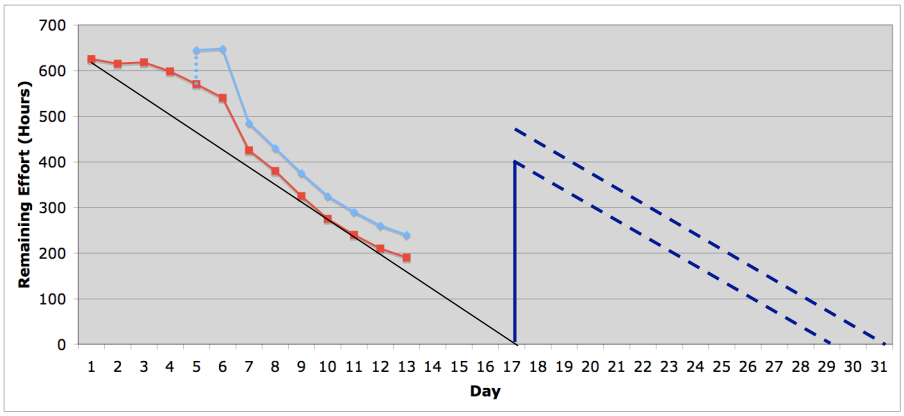
Source: *Adapted from Cockburn, "Crystal Clear"*

Module	Feature Name	Value	Raw Dev. Time (ideal days)	Estimated Elapsed Days	release #
1.1	Configuration generates order line item comments	M	2	5	1
1.2	Configrator UI Rework: Verbose wizard style	H	6	15	1
2.1	PO generated correctly for configuration	H	5	12.5	1
2.2	Create/Confirm vendor items exist for skus	H	1.5	3.75	1
3.1	Advanced Order form shows more details	M	4	10	1
3.2	Order fulfilled at PO cost	H	2	5	1
3.3	Repeat orders works with blind configurations	M	3	7.5	1
3.4	Configuration comments are viewable, not editable	L	1	2.5	1
4.1	Base hierarchy change	H	1.5	3.75	1
4.2	Style can locate price charts based on color selection	H	2	5	1
4.3	Assign specific color group colors to price charts	H	2	5	1
4.4	Separate messages from options	H	2	5	1
4.5	Separate questions from options	H	2	5	1
1.3	Configuration generates customer specific pricing	H	5	12.5	2
1.4	Allow adding a configuration and continue	L	2	5	2
2.3	PO generation is automatic	L	4	10	2

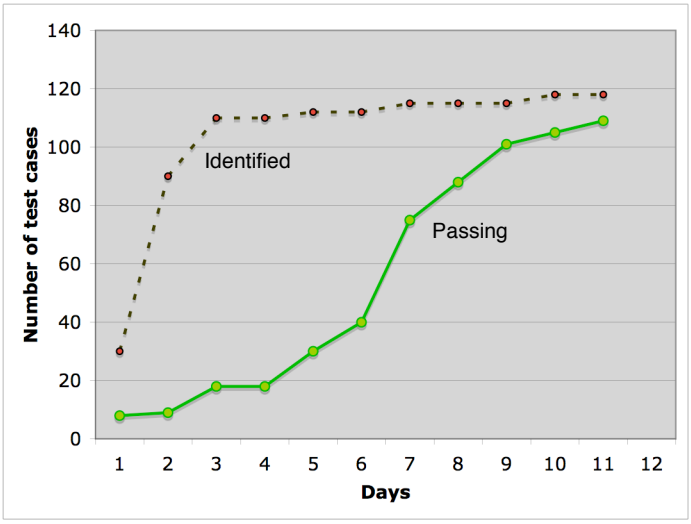
Burn-down Chart



Multi-release trade-offs



Test Case Trend



Meetings as a management tool

Source: Adapted from Pfleeger, 1998, 92

Meetings are expensive

E.g. 8 people on $60k. Meeting costs $480 per hour

Meetings are necessary

Can save money by averting misunderstandings and coordination errors

Time wasters:

- Purpose of meeting unclear
- Attendees unprepared
- Essential people missing
- Discussion gets sidetracked
- Dominance by one or two people
- Argumentative
- Decisions not followed up on

Meetings advice:

- Announce details in advance
  - who should attend
  - start and end times
  - goals of meeting
- Clear agenda, distributed in advance
- Identify a chairperson who:
  - keeps the discussion on track
  - resolves arguments
- Identify a secretary who:
  - keeps track of decisions taken
  - records action items
  - ensures action items are carried out
- Associate a responsible person with each action item

Discussion Question

Management

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Leadership

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