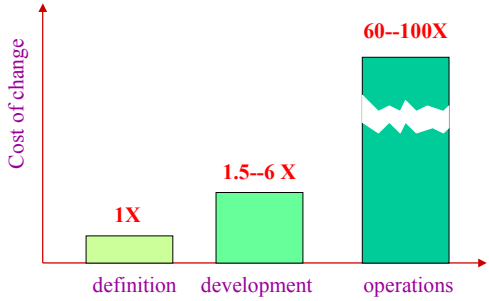
Software Project Management

Impact of Change



Process Maturity Levels (CMM)

- Initial: ad hoc, few processes defined success depends on individual effort
- Repeatable: cost, schedule, and functionality are tracked to repeat earlier success
- Defined: process for both management and engineering is documented, standardized and integrated. All projects use documented an approved version of process for development and maintenance
- Managed: process and products are quantitatively understood and controlled using detailed measures
- Optimizing: continuous process improvement-feedback and testing new ideas and technologies

Team Structure

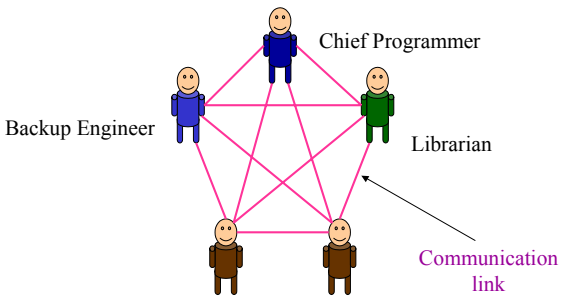
- Democratic Decentralized (DD): no permanent leader. Horizontal communications

  small, difficult, non-modular problems, relaxed deadline, long team-life
- Controlled Decentralized (CD): a defined leader, partitions problems among sub groups. Horizontal (and vertical) communication

  large, easy, modular problems, relaxed deadline, short team-life
- Controlled Centralized (CC): Top-level problem solving and team coordination by leader. Vertical communication

  large, easy, modular problems, strict deadline, short team-life

Chief Programmer (CD)



Risk Management

- Risk Categories: product size, business impact, customer related, process, technology, development environment, staff size and experience.
- Impact: 1-catastrophic 2-critical 3-marginal 4-negligible
- Risk Projection: identity, likelihood, consequences.
- RMMM: Risk Mitigation, Monitoring, Management

Risks	Category	probability	impact	RMMM
Estimates may be very low	PS	65%	2	
End users will resist system	BU	35%	3	
Funding will be lost	CU	40%	1	
Lack of training on tools	DE	70%	3	
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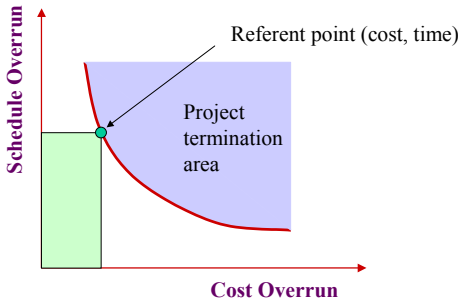
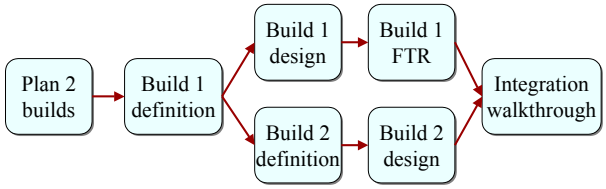
Risk Referent Point



Project Scheduling

- Compartmentalization: number of manageable tasks
- Interdependency: parallel/sequential
- Time allocation: effort, start and completion dates
- Effort validation: tasks should deserve the allocated effort
- Responsibilities: tasks assigned to members
- Outcomes: tasks have deliverables
- Milestones: time to review for quality & approve

Task Network (PERT, CPM)



Timeline Chart (Gantt)

Task	Week1	Week2	Week3	Week4
interview users				
study material				
write SRS				
Milestone: req.				
logical design				
detailed design				
…				

Project Plan

- Introduction
  - Purpose of plan
  - Project scope
- Project Estimates
  - Historical data
  - Estimation techniques
  - Effort, Cost, and Duration Estimations
- Risk Management
  - Discussion of Risks
  - Risk Table
  - RMMM plan for each risk

Project Plan II

- Schedule
  - Work breakdown structure
  - Task Network
  - Timeline Chart
- Project Resources
  - People
  - …
- Staff Organization
  - Team Structure
  - Management Reporting
- Tracking and Control Mechanisms
  - Quality Assurance and Control
  - Change Management and Control
- Appendices

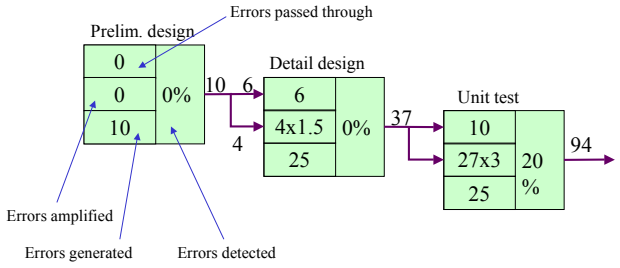
Software Quality Assurance

- A Quality Management Approach
- Effective Software Eng. Technology
- Formal Technical Reviews throughout
- Multi-tiered testing strategy
- Control of documentation and its changes
- Standards compliance procedure
- Measurement and reporting mechanisms

Three Points in SQA

- Requirements are the foundation from which quality is measured
- Standards set development criteria directly affecting quality
- Unmentioned implicit requirements are important (e.g. maintainability)

Defect Amplification Model



Formal Technical Review

- 3-5 people attend: producer, review leader, reviewers
- advance preparation < 2 hours/person
- meeting duration < 2 hours
- record results: accept, reject, or provisions
- review product not the producer
- maintain agenda
- limit debate
- find problems, don't attempt solutions
- ...

Statistical Quality Assurance

Pareto principle: 80% of defects relate to 20% of causes

The following causes are found to be representative:

- IES Incomplete/erroneous specs
- MCC Misinterpretation customer comm.
- IDS Intentional deviation from specs
- VPS Violation of programming standards
- EDR Error in Data representation
- IMI Inconsistent module interface
- EDL Error in design logic
- IET Incomplete/erroneous testing
- IID Inacurate/incomplete documentation
- PLT programming language translation of design
- HCI ambiguous/inconsistent interface
- MIS miscellaneous

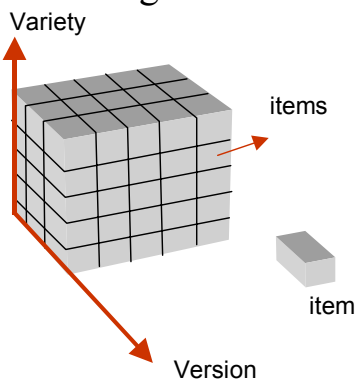
Software Configuration Management

- Preserving the variations on intermediate products
- Change Management
- Version Management / Family of Products
- Baseline

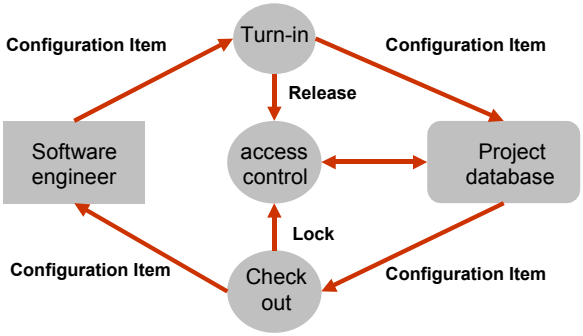
Software Configuration Items

- Documents
- Code
- Data
- …

Configuration Item Pool



Access and Synchronization



Decision Tree - make or Buy?