Process Management

CS3: SEOC1

Note 6

Planning

Planning is a process which goes on throughout a software project. Our state of knowledge improves as the requirements and design become clearer, and then we can revise plans to allocate resources more accurately to the tasks in the project.

Phases of Planning

1. **Establish objectives and scope:** Objectives expressed in general terms and in the language of application domain. Scope establishes (broad) constraints of the system.
2. **Explore alternative approaches:** Feasibility study in early stages. Alternatives should include non-computer based solutions.
3. **Establish a measurement framework:** Need to estimate resource required for a task – will vary with "size" of problem. Such measures often stable and predictable within one design team (common techniques and experience) but not so across teams.
4. **Estimate resources required:** Estimate *kinds* of resource (support, design, implementation, documentation, testing); and estimate *quantity* of each.

Phases of Planning (cont. . .)

5. **Risk analysis:** Identify potential risks in development process, *not* in application domain. A risk is a "potential bad event", measure of severity , and likelihood that the bad event will happen. Risk analysis aims to identify and manage risks so the overall risk in a project is acceptable.
6. **Scheduling:** Explores possible ways of allocating (limited) resource across tasks.
7. **Tracking and control:** Projects do not necessarily keep to plan. It is important to track the progress of the project and compare it to the plan. If significant divergences arise it is necessary to re-plan to take account of the changed circumstances.

Scoping the Problem

- Identify the customer
- Customer discussions:
  - Who is the end user? *(often not the customer)*
  - Who has the authority to accept the finished product?
  - What problem are we addressing?
  - What documentation will be required?
  - When do they believe they need the product?
  - Where is the work to be done?
  - Why do they need the product?
  - How will the product be developed / acquired?
- Identify the systems environment
- Identify necessary tools
- Identify potential re-use

. . . the other Planning Phases

Planning iterates through all *the phases of planning as we move through the lifetime of the project. Further information on* measurement, estimation, risk, scheduling *and* tracking *are contained in a note available from the course log-page.*

Main points to note:

Measurement: great diversity of metrics, controversial (arguable not useful) yet widely used

Estimation: resources include *infrastructure*, *staff* and *time*. Risk increases with *size of problem*, *variability in requirements*, *complexity with respect to previous experience*

Risk: identify, estimate, reduce to acceptable levels, revise estimates throughout project

The Role of the Project Manager

Estimation of the project effort, time and cost.

Planning scheduling deliverables, review points and allocation of staff to activities.

Replanning re-estimating and rescheduling in the light of unfolding circumstances.
e.g. risks, quality assurance results.

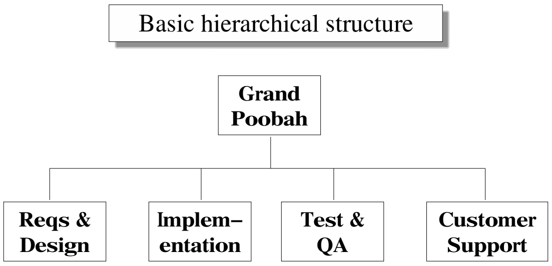
Organisation establishing a division of labour which is able to make the most effective use of available skills and maximises productivity potential in the context of the characteristics (e.g. risk factors) of the particular project.

Quality assurance planning and carrying out actions to ensure that the software product meets required quality targets.

Project Management: Organisational Forms

- Functional
  - Basic, hierarchical form
  - Project organized by disciplines and functions
- Matrix
  - Separate disciplines from project management
  - Strong or weak matrix organizations
- Integrated Product Development Teams (IPDTs)
  - Should be dynamic in nature
  - Team has total responsibility for a product
  - Must also have matching authority

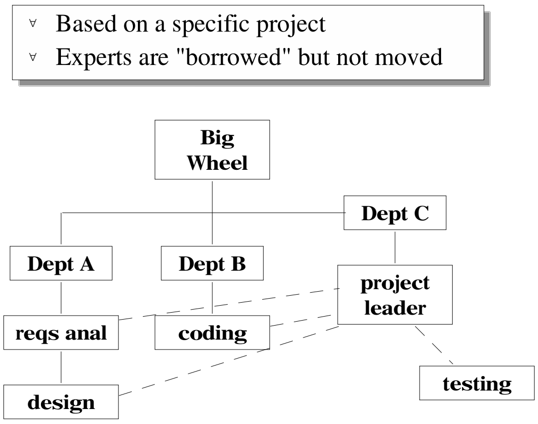
Functional Organisation



Functional Organisation

- Characteristics:
  - Narrow set of work methods
  - Technical expertise deeper
  - Develops skills and morale
  - Service-oriented
  - Communication responsibility on group manager
- Problems:
  - Elitism within expertise areas
  - No project "ownership"
  - Communication difficult

Matrix Organisation



Strong versus Weak

- Strong Matrix:
  - Team leader is principal authority
  - Control of funds
  - Control of schedule, budget
  - Acquire personnel
  - Perform reviews

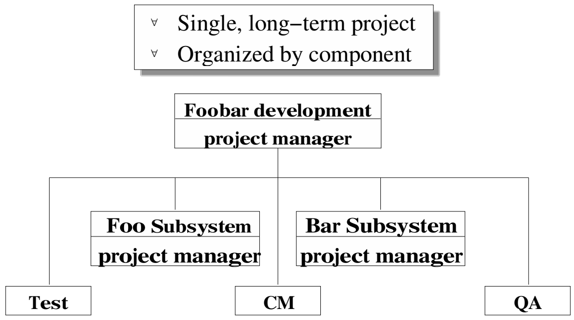
  Weak Matrix:
  - Team leader is only a coordinator
  - Spokesperson to higher management
  - Steering committee has ultimate authority

Matrix Organisation

- Characteristics:
  - Specialists work on part-time basis for several projects
  - Top management selects project manager and staff
  - Good for short-lived projects
  - "Task force" mentality

  Problems:
  - Staff attention fractured
  - Conflicting obligations
  - Large amount of communication
  - Strong top management involvement
  - Reporting to home "base" is difficult

IPT Organisation



IPT Organisation

- Characteristics:
  - Tightly controlled effort
  - Complex or large projects
  - Independent authority for submanagers
  - Direct contact with customer
  - Reporting is much easier

  Problems:
  - Loss of project – what to do with staff?
  - Difficult to enforce standards
  - Overspecialisation

Software IPT Roles