Lecture 02

Software Development Process Models

Software Development Life Cycle/Phases/Steps

1. Request Generation
2. Problem Identification
3. Feasibility Study and Analysis
4. Data Collection and Analysis
5. Design
6. Coding
7. Testing
8. Implementation
9. Maintenance and Post Maintenance Action

Request Generation

- Request for generating new system or existing system, from user side or customer side/ inhouse requirement
- Bids for new system/ existing system to be modify
- Tender, Requisition, Documentation etc.
- Example
  - ITC Sales/Reporting System
  - Computerised Banking System
  - Inhouse Project

Problem Identification

- Features to be included or excluded from the system
- Sets the direction of the whole project
- Sets the project bounds
- Define what parts of the project can be change
- Project goal, bounds and resource limits
- Rough idea of resource requirement

Feasibility Study and Analysis

- One or more conceptual solution to the problem
- Input will be needed and output will be produced

1. Technical Feasibility
   - Technology and skill of the organization
2. Operational Feasibility
   - Proposed solution satisfies user objectives and can fitted into current system operation
3. Economical Feasibility
   - Cost/Benefit Analysis

Data Collection and Analysis

- **Data Collection**
- Questionnaires, Discussion, Meeting, Study of manuals, Reporting, Program listing, Documents etc.
- **Analysis**
- Using some Software tools for this methods
  - CASE(Computer Aided Software Engineering)
  - E-RD,DFD,SC,DD,OOAD etc.

Design

1. **System Design**
   - Broad
     - Equipment selection
       - Choice of Hardware, Software, Operating system, DBMS etc.
       - Batch / Online
       - Network / Distributed
       - Time share or not
   - Detailed

2. **Program Design (same as detailed design)**

Design

1. Program Design (same as detailed design)
    - Function / Procedure design
    - Module design
    - Interface design
    - Input / output design
    - Man Machine Interface design
    - Report Layout
    - Table / Relation design
    - Security design

Coding

1. Design Specification
    - Objective can’t simply converted

2. Formal Specification
    - More or less cent % error free due to subjective

Testing

1. Module Testing / Unit Testing

1. Integrity Testing
    - Top_down
    - Bottom_Up

Implementation

- Component built during coding and testing are put together into operational use
- The system is ready for execution

Maintenance and Post Maintenance

- Maintenance depends upon the agreement with the client
- That may be during the 1st year / 2nd year after installation of the product
  - Fixing bugs, changing formats, interface etc. may be done

Models

1. Waterfall model
2. Prototype Model
3. Iterative Model
4. Spiral Model

Waterfall Model

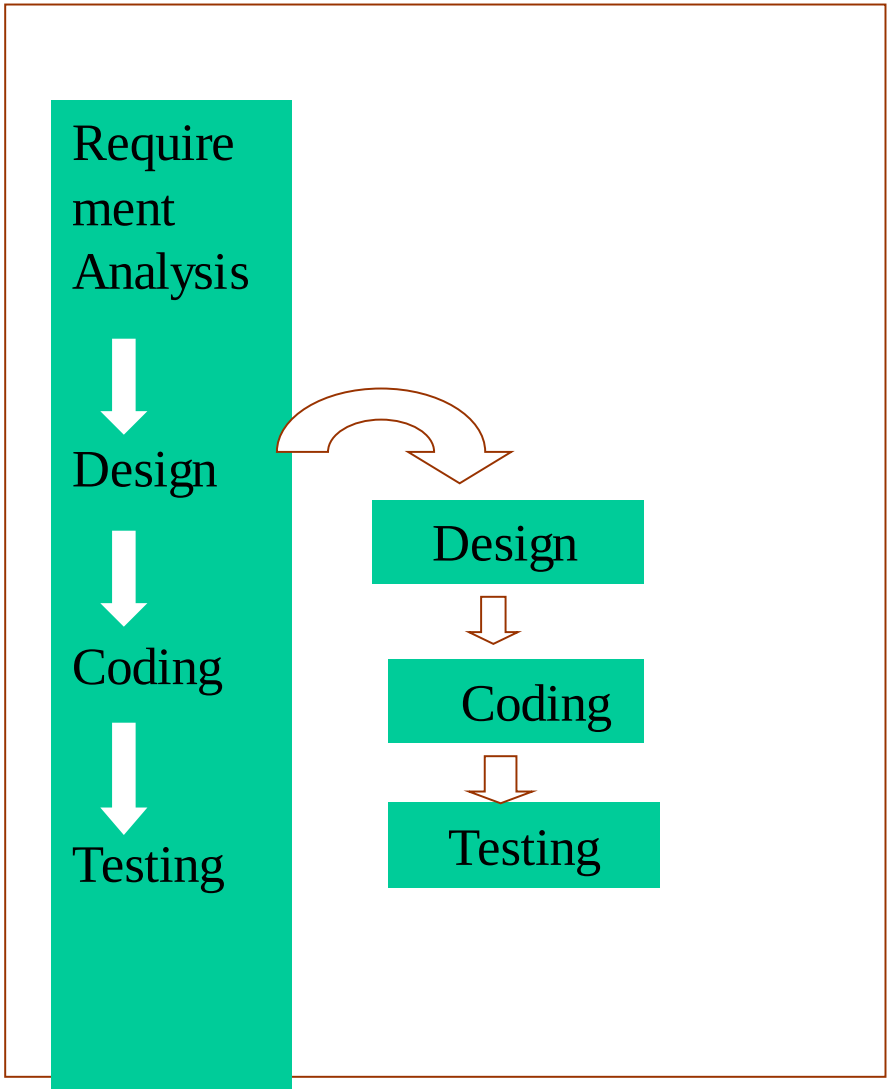
- Phases in linear order
- Starts from feasibility study
- **Project Outputs in Waterfall model**
  - Requirements documents
  - Project plan
  - System design document
  - Detailed design document
  - Test plan and test report
  - Final code
  - Software manuals (e.g. user, installation, etc.)
  - Review reports

Waterfall Model (Cont.)

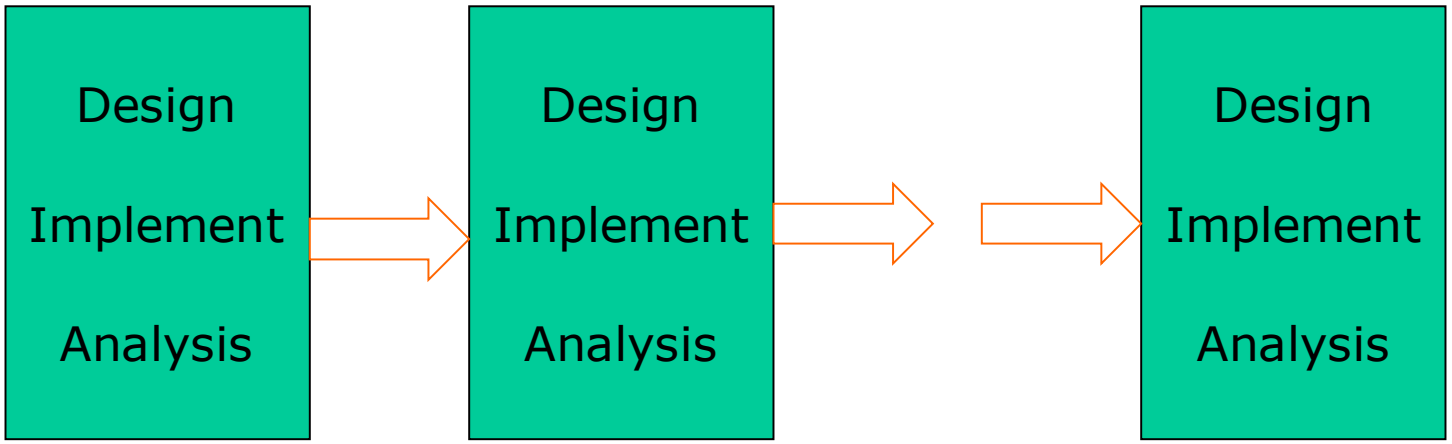
- Limitations
  - Requirements of a system can be frozen before design
  - Hardware selection early
  - The waterfall model stipulates that the requirements should be completely specified before rest of the development can proceed

Prototype Model

- Counter the 1st two limitations
- Throwaway prototype
- Build in twice approach
- Reduce the overall development cost
- Provide a system with overall functionality
- Cost of testing and prepare documentation is reduced



Iterative Enhancement Model



- Counter the last limitation
- Combine the benefits of both prototyping and Waterfall models
- Project control list (contains, in order, all the tasks that must be performed to obtain the final implementation)

Boehm's Spiral Model