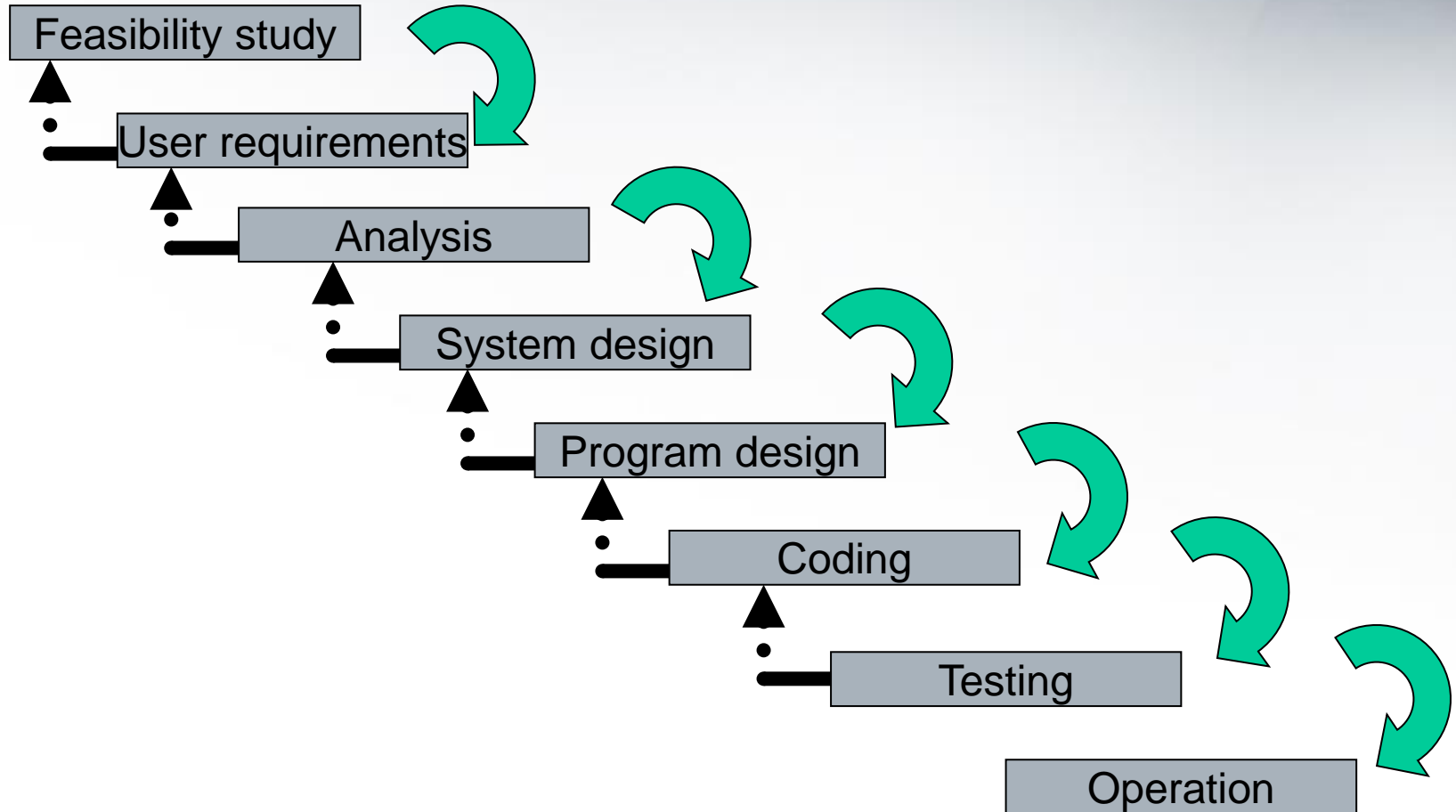# Choice of Process Models

- Executing one or more activities – Process
- Activities can be organized in different ways
- Can be categorized into different *process models*
- Major part of the planning will be the choosing of the development methods to be used and slotting of these into an overall process model

# Choice of Process Models …

## The Waterfall Model

Feasibility study

User requirements

Analysis

System design

Program design

Coding

Testing

Operation

# Choice of Process Models …

**The Waterfall Model** (continued…)

- There is a sequence of activities working top to down
- Arrows pointing upwards and downwards indicates that it is necessary to go back and rework tasks that we thought has been completed.
- It is similar to Waterfall which flows downwards with possibility of just a little splashing back
- The project is expected to progress down the path through each of the phases of development

# Choice of Process Models …

- **The Waterfall Model** (continued…)

  - Advantage
    - Waterfall approach allows project completion times to be forecast with more confidence

# Choice of Process Models …
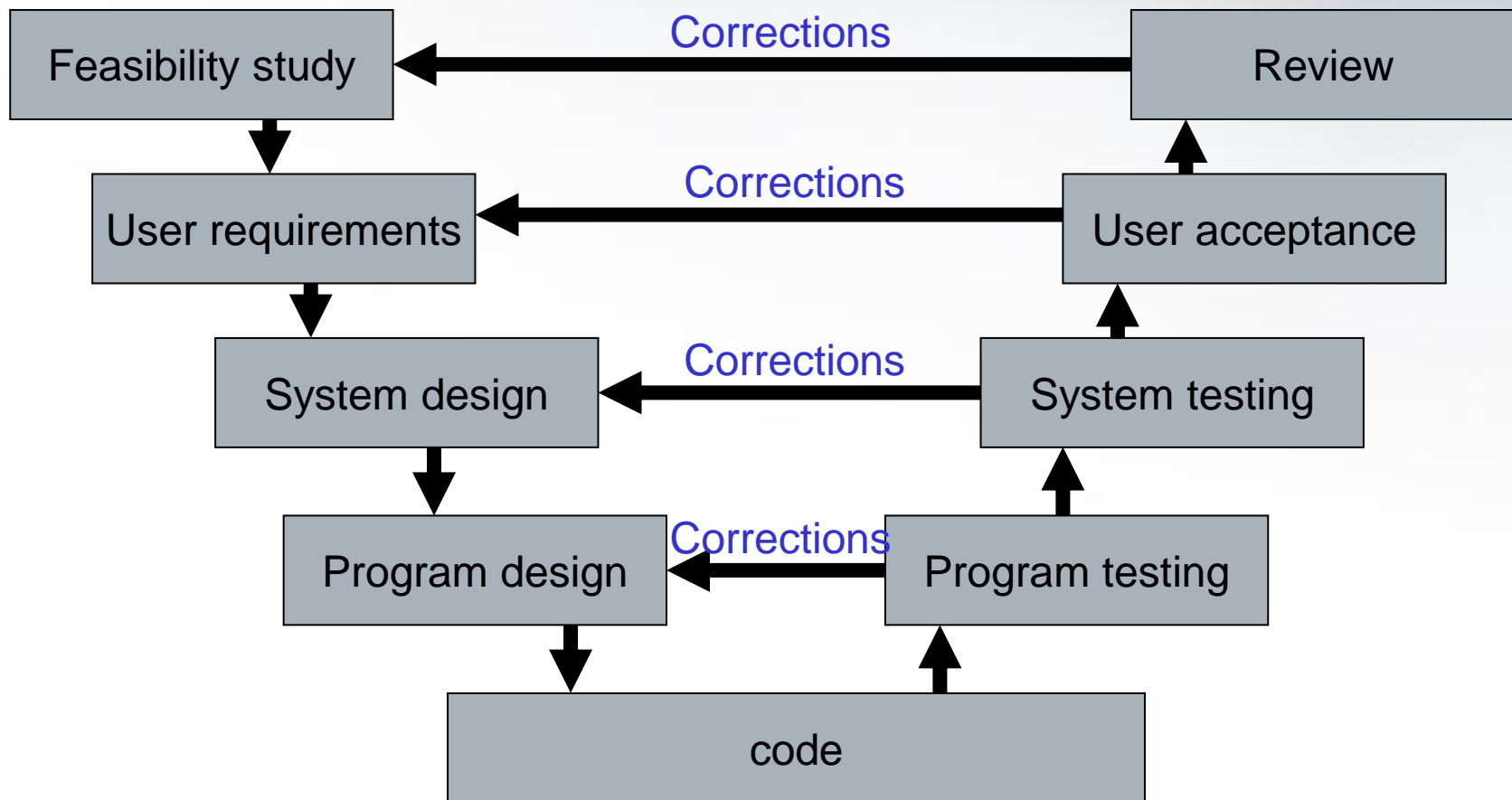
- **The Waterfall Model** (continued…)

  - Disadvantages
    - Customers must be able to express their requirements completely, correctly and with clarity
    - Delays can occur in design, coding and testing
    - Difficult to access the true stage of progress during the first two to three stages
    - No demonstration of system capabilities can occur until the end of the project

# Choice of Process Models …

- **The V – process model**



Feasibility study ← *Corrections* ← Review

User requirements ← *Corrections* ← User acceptance

System design ← *Corrections* ← System testing

Program design ← *Corrections* ← Program testing

code

# Choice of Process Models …

- **The V – process model** (continued…)

  - Elaboration of the waterfall model

  - Stresses the necessity for validation activities

  - Each step has matching validation process

  - Defects cause a loop back to the corresponding development stage and a reworking of the succeeding steps

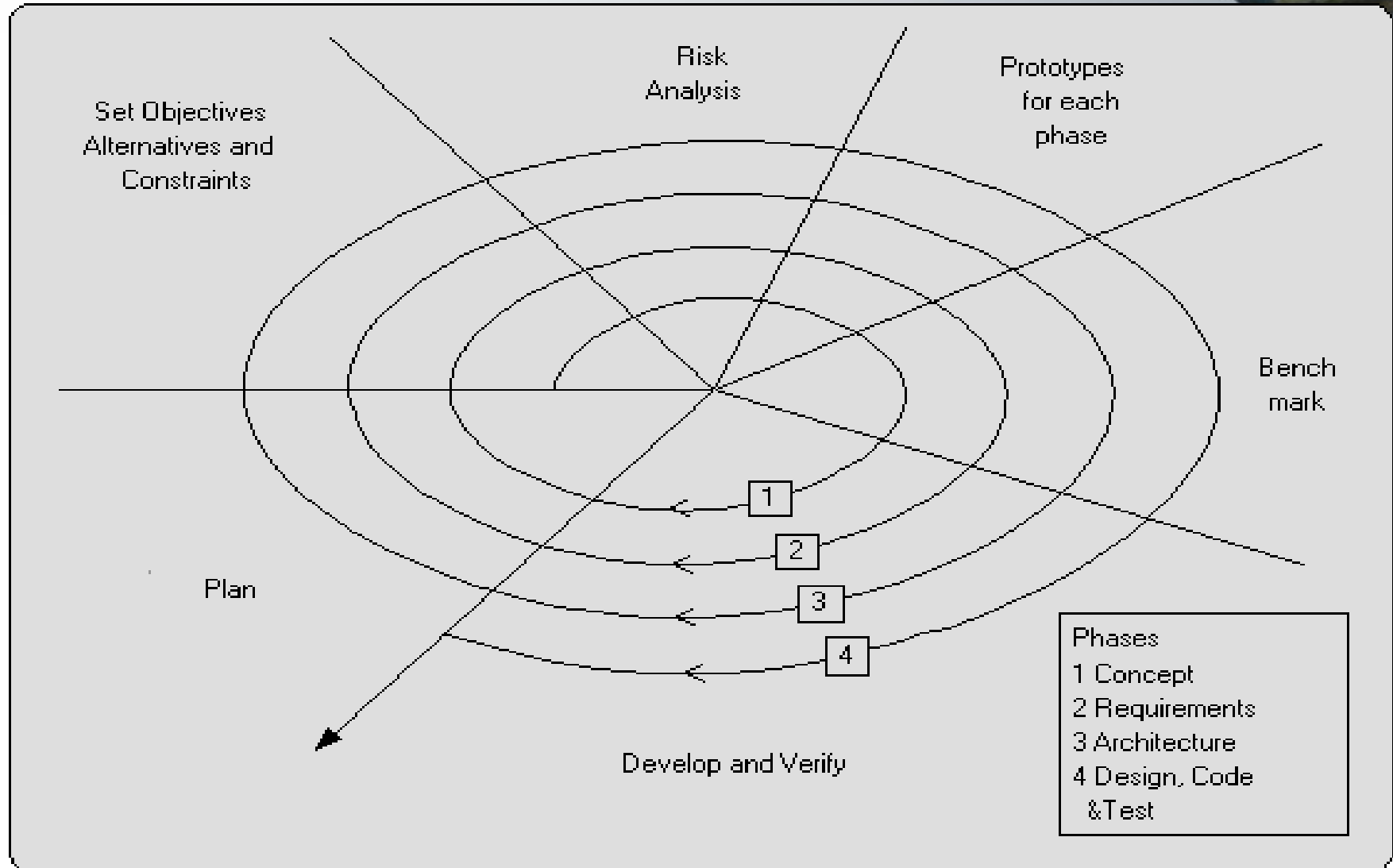  - May slip into an 'evolutionary prototype'

# SPIRAL MODEL

- Another way of looking at waterfall model.

- Greater level of detail are considered at each stage of the project

- Hence greater degree of confidence about the success of the project

- More details are analyzed in each sweep and an evolution process is          undertaken for next iteration.

# Spiral Model



Risk Analysis

Prototypes for each phase

Set Objectives Alternatives and Constraints

Bench mark

Plan

1

2

3

4

Develop and Verify

Phases
1 Concept
2 Requirements
3 Architecture
4 Design, Code & Test

# Software Prototyping

- A prototype is a working model of one or more aspects of the projected system.
- In order to test assumptions it is constructed and tested quickly and inexpensively.
- Classification
  - Throw-away prototypes
    - Used only to test out ideas and is then discarded.
  - Evolutionary prototypes
    - It is developed and modified until it is in a state where it can
    - become the operational system.
  - Incremental prototypes
  - The operational system is developed and implemented in small stages so that the feedback from earlier stages can influence later stages of project

# Software Prototyping

- Advantages
    - Learning by doing.
    - Improved communication and user involvement.
    - Reduced need for documentation.
    - Reduced maintenance costs.
    - Production of expected Results.
- Disadvantages
    - Lack of control and projects standards.
    - Additional expense.
    - Close proximity of developers.

# Software Prototyping

- Other ways of categorizing prototypes

  - What is being learnt?

  - To what extent is the prototyping to be done?

  - What is being prototyped?

# Software Prototyping

- What is being learnt?
    - Helps to learn about an area of uncertainty in the project.
    - Specify what they hope to learn from the prototype
    - Plan how the prototype is to be evaluated.
    - Report on what has actually been learnt.
- To what extent is the prototyping to be done?
    - Mock-ups.
    - Simulated interaction.
    - Partial working model.
    - Vertical: some features are prototyped fully.
    - Horizontal: All features are prototyped but not fully.
- What is being prototyped?
    - Human - Computer Interface.
    - The Functionality of the system.

At what stage of a system development project (for example, feasibility study, requirements analysis etc.) would a prototype be useful as a means of reducing the following uncertainties?

(a) There is a proposal that the senior managers of an insurance company have personal access to management information through an executive information system installed on personal computers located on their desks. Such a system would be costly to set up and there is some doubt about whether the managers would actually use the system.

(b) A computer system is to support sales office staff who take phone calls from members of the public enquiring about motor insurance and give quotations over the phone.

(c) The insurance company is considering implementing the telephone sales system using the system development features supplied by Microsoft Access. They are not sure, at the moment, that it can provide the kind of interface that would be needed and are also concerned about the possible response times of a system developed using Microsoft Access.