



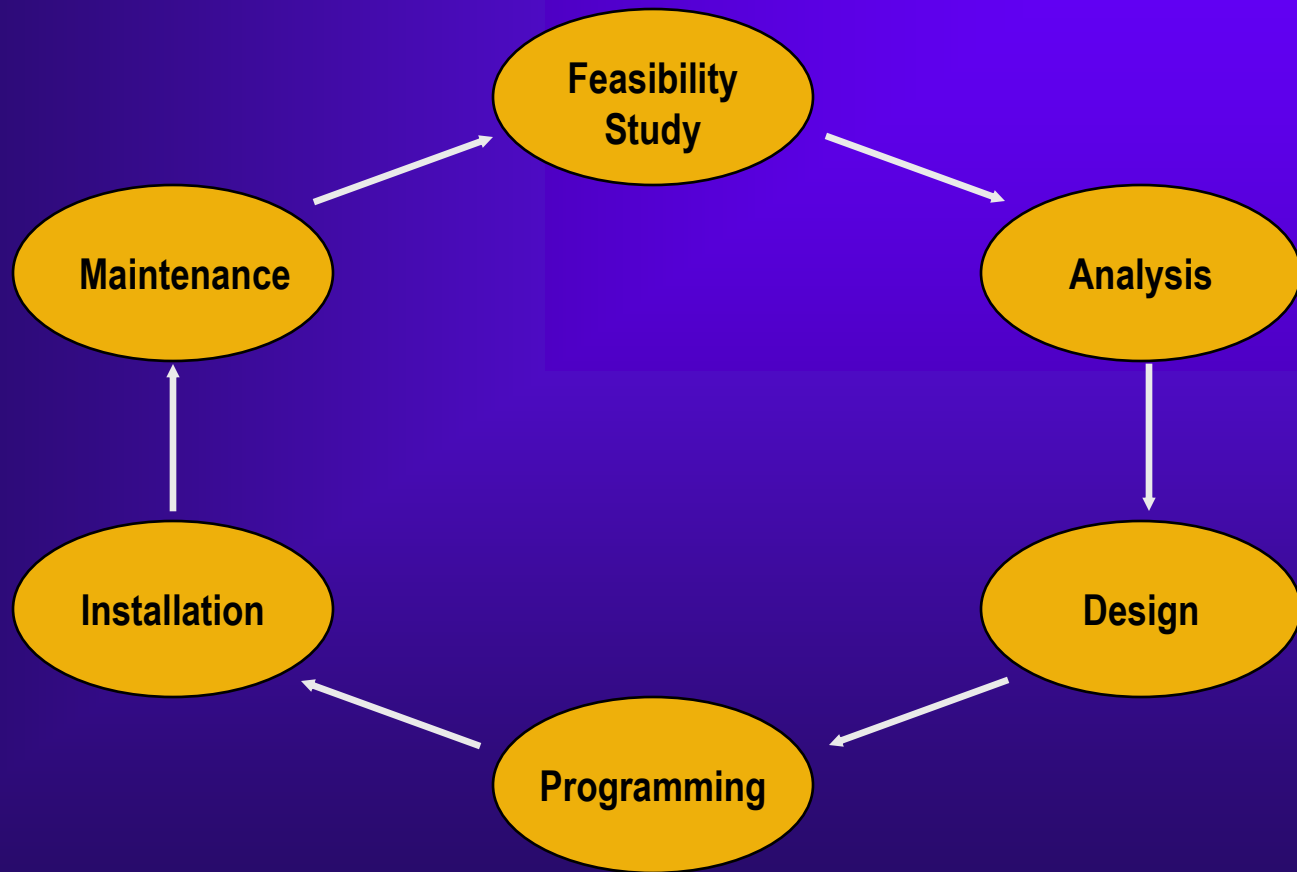
The Information Systems Life Cycle



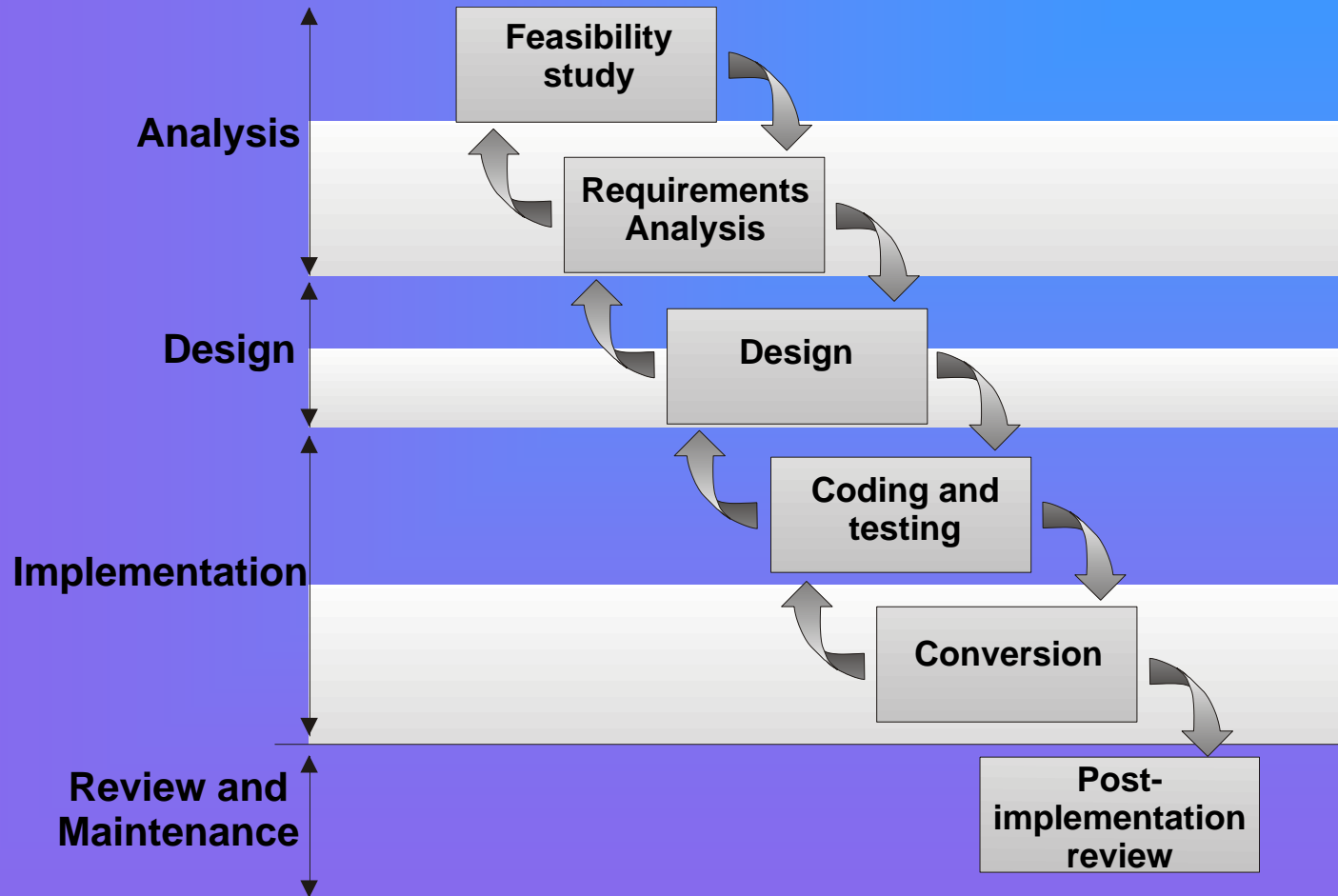
Overview of Systems Life Cycle

- ◆ **Goals must be thoroughly understood**
- ◆ **Formal procedures and methods ensure:**
 - On-time delivery to required specification
- ◆ **Methodology**
 - Sequential
 - Each stage well-defined
 - Developed in 60s and 70s to suit transaction-processing systems

Systems Life Cycle



The waterfall model





The waterfall model

- ◆ Shows developers may have to re-think and re-work some stages
- ◆ Project milestones
 - Terminate each stage
 - Work is 'signed-off'
 - Approval required to proceed to next stage
- ◆ End-user not involved in developmental process
 - This requires very accurate statement of requirements
 - This is a major drawback



What prompts a new system?

- ◆ The current system may no longer be suitable for its purpose
- ◆ Technological developments may have made the current system redundant or outdated
- ◆ The current system may be too inflexible or expensive to maintain



Feasibility study (TELOS)

◆ Technical feasibility

- does the technology exist to implement the proposed system, or is it a practical proposition?

◆ Economic feasibility

- is proposed system cost-effective – if benefits do not outweigh costs, it's not worth going ahead.

◆ Legal feasibility

- Is there any conflict between the proposed system and legal requirements – e.g. the Data Protection Act?

◆ Operational feasibility

- are the current work practices and procedures adequate to support the new system?

◆ Schedule feasibility

- how long will the system take to develop, or can it be done in a desired time-frame?



Requirements analysis

Gathering details about the current system will involve:

- **Interviewing staff at different levels**
 - from end-users to senior management
- **Examining current business and systems documents and output**
 - may include current order documents, computer systems procedures and reports used by operations and senior management
- **Sending out questionnaires**
 - the questions have to be carefully constructed to elicit unambiguous answers
- **Observation of current procedures**
 - by spending time in various departments. A time and motion study can show where procedures could be more efficient, or to detect bottlenecks



Requirements analysis (cont.)

Systems analyst's report will:

- Examine data and information flows in the organisation
 - May use data flow diagrams
- Establish what the proposed system will actually do
 - (not how it will do it)
- Analyse costs and benefits
- Outline system implementation options (e.g. in-house or using consultants)
- Consider possible hardware configurations
- Make a recommendation



System design

specifies the following aspects of a system:

- **The hardware platform** - which type of computer, network capabilities, input, storage and output devices
- **The software** - programming language, package or database
- **The outputs** - report layouts and screen designs
- **The inputs** - documents, screen layouts, validation procedures
- **The user interface** - how users will interact with the computer system
- **The modular design** - of each program in the application
- **The test plan and test data**
- **Conversion plan** - how the new system is to be implemented
- **Documentation** - including systems and operations documentation. Later, a user manual will be produced



Implementation

- ◆ Coding and testing of the system
 - ◆ Acquisition of hardware and software
 - ◆ EITHER
 - Installation of the new system
- OR
- Conversion of the old system to the new one



Installation

This can include

- Installing the new hardware, which may involve extensive recabling and changes in office layouts
- Training the users on the new system
- Conversion of master files to the new system, or creation of new master files.



Methods of conversion

◆ Direct changeover

- The user stops using the old system one day and starts using the new system the next — usually over a weekend or during a slack period

◆ Parallel conversion

- The old system continues alongside the new system for a few weeks or months

◆ Phased conversion

- Used with larger systems that can be broken down into individual modules that can be implemented separately at different times

◆ Pilot conversion

- New system will first be used by only a portion of the organisation, for example at one branch or factory



Post-implementation review

- ◆ Review may result in:
 - Some programming amendments
 - Adjustment of clerical procedures
 - Modification of some reports
 - Request for new programs



System maintenance

◆ Perfective maintenance

- This implies that while the system runs satisfactorily, there is still room for improvement.

◆ Adaptive maintenance

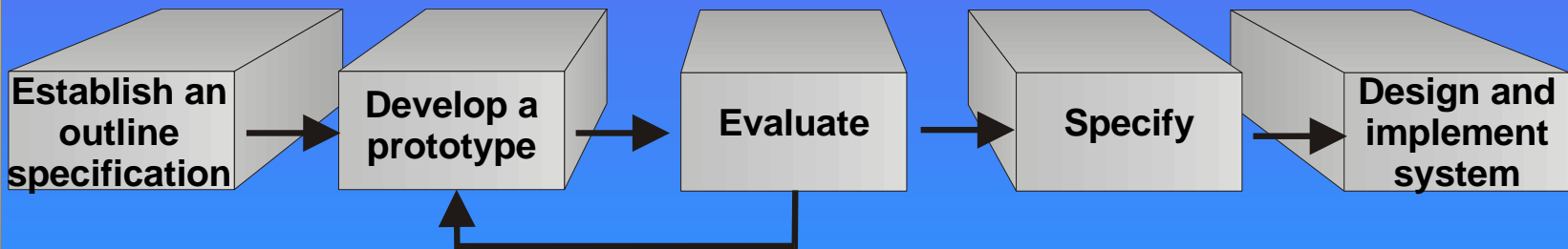
- All systems will need to adapt to changing needs within a company.

◆ Corrective maintenance

- Problems frequently surface after a system has been in use for a short time, however thoroughly it was tested. Any errors must be corrected.

Prototyping

- ◆ The waterfall model of the system life cycle doesn't allow for modifications to the design.





Benefits of prototyping

- ◆ **Misunderstandings between software developers and users can be identified**
- ◆ **Missing functions may be detected**
- ◆ **Incomplete or inconsistent user requirements may be detected**
- ◆ **A prototype version will be quickly available to demonstrate the feasibility to management**
- ◆ **The prototype can sometimes be used for training before the final system is delivered**



Varieties of prototyping

- ◆ **Piloting**
 - Using a prototype to test feasibility
- ◆ **Modelling**
 - To develop an understanding of user requirements
- ◆ **Throw-away prototyping**
 - Discarded after evaluation and then real system is built
- ◆ **Evolutionary prototyping**
 - Each prototype takes a step towards the final solution