

Problems with Software

- fails to do what users want it to do
- it is expensive
- it is not always fast enough
- it cannot be transferred to another machine easily
- maintenance is expensive
- it is unreliable
- it is often late

Most important present day problems:

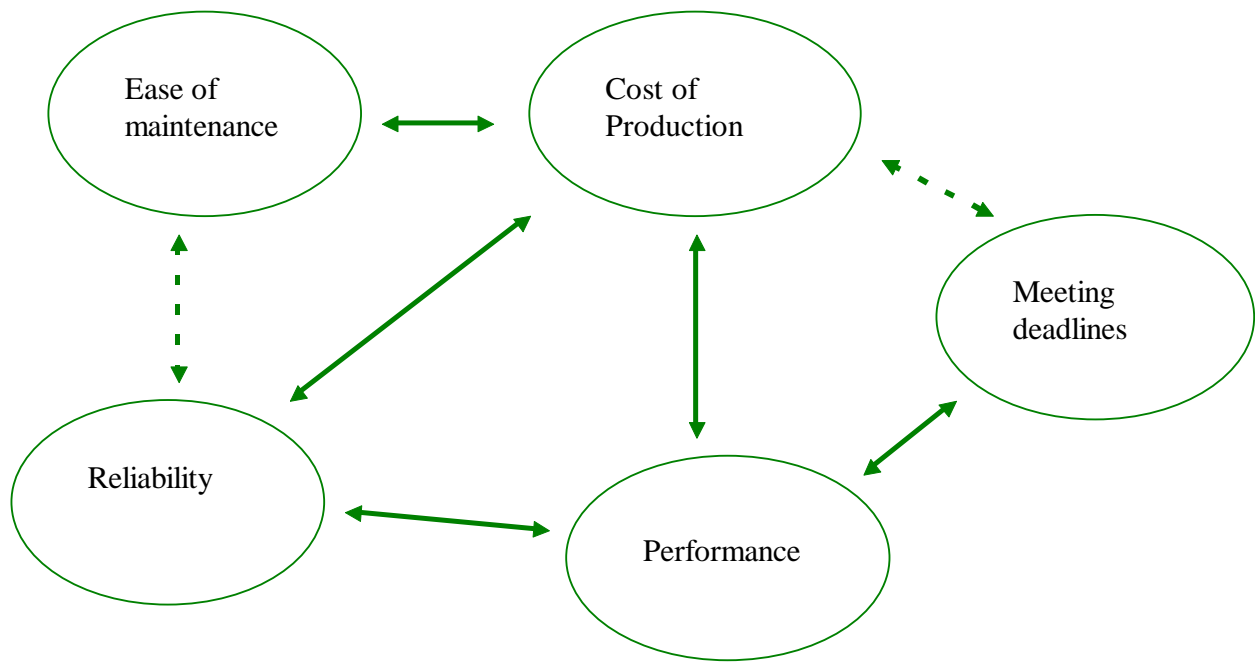
- Meeting users' needs
- reducing software costs
- improving reliability
- delivery on time

Many argued that software development was in a **crisis**

Needed a scientific approach, i.e. based on sound principles and methods

Hence the term **Software Engineering** - not just a fancy term for programming

One obstacle to tackling the problems of software is that the problems conflict with each other:



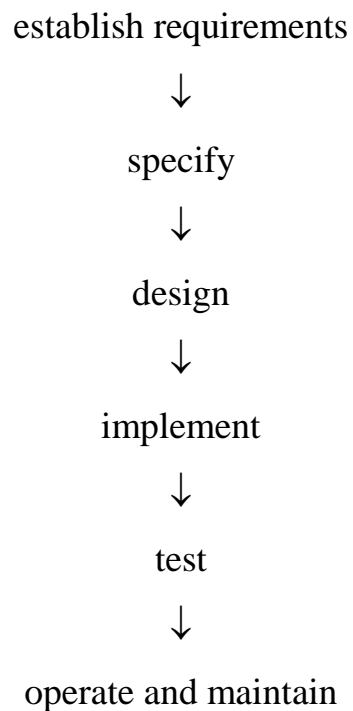
Remedy - Software Engineering

- A few ideas have been suggested and tried to deal with above problems
 - greater emphasis on carrying out stages of development systematically
- computer assistance for software development, fourth generation languages (4GLs), CASE tools
- concentration on finding out exactly what the users of the system really want
- formal specification of requirements
- prototyping - demonstrating an early version of the system to the users
- using new programming languages
- testing - greater emphasis on trying to ensure that the software is free of bugs

Most important idea in improving software development is the software development lifecycle, in particular the **waterfall model**.

Waterfall Lifecycle

development is split up into independent steps that are carried out in sequence:



Principles of the Lifecycle Model

1. It is a systematic series of steps
2. Each step is well defined
3. Each step creates a definite product (usually only on paper)
4. The correctness of each step can be carefully checked