TOPICS

The Nature and History of Software Development

Problems with Software Development

Software Engineering Paradigms and Technology

PROBLEMS WITH SOFTWARE DEVELOPMENT

- Problems
- Causes

Problems

1. **We have little data on the software development process.**
2. **Customers are often dissatisfied with the software they get.**
3. **Software quality is hard to define and measure.**
4. **Existing software is often very difficult to maintain.**

Can these problems be overcome?

- Historically, measurements of software development were not done, so we did not gather any data from past experiences to use in predicting the schedules and costs of future projects.
- Customer needs were usually understood only vaguely. Consequently, programs often fell short of the customers' desires.
- A solid quantification of the metrics associated with the software does not exist, so it becomes difficult to predict software quality.
- Maintenance has become the most expensive, difficult, and poorly planned task of the entire software life cycle.

Causes

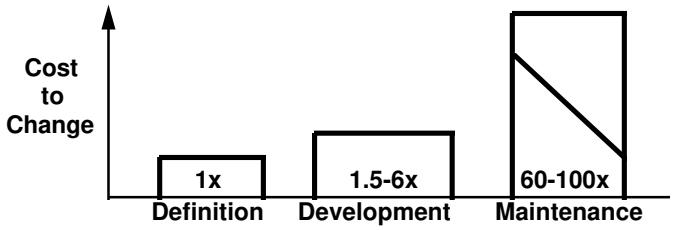
- No spare parts to replace, so an error in the original software is also in every copy.
- Software quality is a human problem.
- Project managers often have no software development experience.
- Software developers often have little or no formal training in engineering the development of the software product.
- Resistance to change from programming as an art to programming as an engineering task can be significant.

SOFTWARE MYTHS

- Customer Myths
- Developer Myths
- Management Myths

Customer Myths

Myth	*Reality*
• A general statement of objectives is enough to get going. Fill in the details later.	• Poor up-front definition of the requirements is *THE* major cause of poor and late software.
• Project requirements continually change, but change can be easily accommodated because software is flexible.	• Cost of the change to software in order to fix an error increases dramatically in later phases of the life of the software.



Developer Myths

Myth	*Reality*
• Once a program is written and works, the developer's job is done.	• 50%-70% of the effort expended on a program occurs after it is delivered to the customer.
• Until a program is running, there is no way to assess its quality.	• Software reviews can be more effective in finding errors than testing for certain classes of errors.
• The only deliverable for a successful project is a working program.	• A software configuration includes documentation, regeneration files, test input data, and test results data.

Management Myths

Myth	*Reality*
• Books of standards exist in -house so software will be developed satisfactorily.	• Books may exist, but they are usually not up to date and not used.
• Computers and software tools that are available in-house are sufficient.	• CASE tools are needed but are not usually obtained or used.
• We can always add more programmers if the project gets behind.	• "Adding people to a late software project makes it later." -- *Brooks*