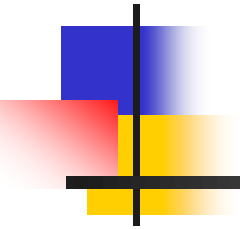


Chapter 1

Software Characteristics

Objectives

- *Describe software problems*
- *Describe the characteristics of the software as a process*
- *Describe the characteristics of the software as a product*
- *Explain the need for the Software Engineering discipline*
- *Define Software Engineering goals*
- *Discuss the role of a Software Engineer in its current context*

Software Engineering- Definition

- "The application of a systematic, disciplined, quantifiable approach to the development, operation and maintenance of software; that is, the application of engineering to software." - IEEE Glossary

Software Defined

- A collection of computer programs, procedures, rules, and associated documentation and data.

Software – The Problems

- Cost of Software
- Reliability
- Change and Rework

Software as a process

- Consists of a set of activities
- Includes constraints
- Desired output is high quality product at low cost

Software Process Characteristics

- Predictability
- Support Testability and Maintainability
- Early Defect Removal and Prevention
- Process Improvement

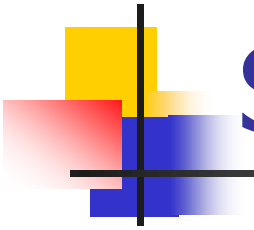
Software as a product

- Developed or engineered
- Malleable
- Does not “wear out”
- Most are custom-built, rather than being assembled from existing components

Why Software Engineering?

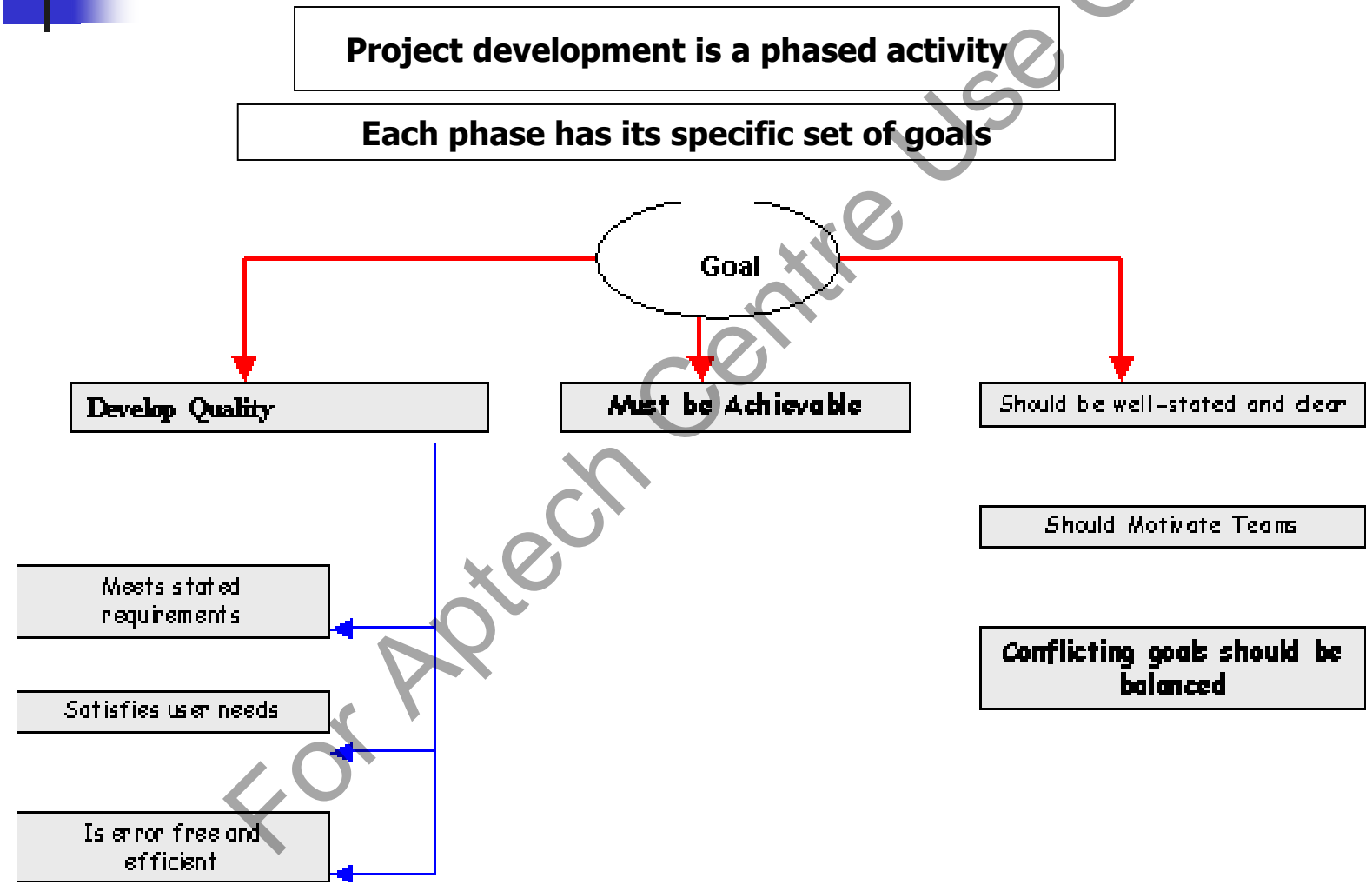
- Plays an Influencing role in the development of Software and its Quality

The influencing role of Software Engineering



- Individual ability
- Team communication
- Non-linear estimation
- Change control
- Available project time
- Problem understanding
- Inadequate training
- Lack of management skills
- (Rising) Level of user expectations

Software Engineering Goals



A Software Engineer defined

- "A Software Engineer is a person who applies Software Engineering principles to the process of software development."

Role of a Software Engineer

- Be a good programmer
- Be familiar with various design approaches
- Be able to translate user requirements into specifications
- Be able to interact with the users on various areas of an application
- Possesses good managerial skill

Summary

- Software cost forms the major component of a computer system's cost. Software is currently extremely expensive to develop and is often unreliable.

- Software is not just a set of computer programs but comprises of programs and associated data and documentation. Each of these items is a part of the software engineering process. The main problems for software development currently are: high cost, low quality, and frequent changes causing change and rework.

- Software has become a limiting factor in the evolution of computer-based systems. The intent of software engineering is to produce a framework for building higher quality software.