COCOMO MODEL

Constructive Cost Model

COCOMO Model

- The COCOMO model is an empirical model that was derived by collecting data from a large number of software projects.
- It is comprehensive with large number of parameters that can take a range of values
- The first version of COCOMO model (COCOMO 81) was three-level model where the levels corresponded to the detail of analysis of the cost estimate
- The first level provided an initial rough estimate, the second level modified this using a number of projects and process multipliers and the most detailed level produced estimates for different phases of the project

COCOMO Modes

- Within each of these models there are also three different modes.
- The mode will depend on your work environment, and the size and constraints of the project itself.
- The modes are:

1. Organic : This mode is used for relativity small software teams developing software in a highly familiar, in-house environment.
2. Embedded : Operating within tight constraints where the product is strongly tied to a complex of hardware, software, regulations and operational procedures.
3. Semi-detached : An intermediate stage somewhere in between organic and embedded. Projects are usually of moderate size of up to 300,000 lines of code.

COCOMO Model

- There always has been changes going on in the project.
- To take these changes into account COCOMO II model recognizes different approaches to software development. The sub models of the COCOMO II model are
  - An application composition model
  - An early design model
  - A reuse model
  - A post architecture model
  - In next slide you will see the basic COCOMO formula for different types of projects where the multiplier M reflects product, project and team characteristics.

Basic COCOMO Model

Project complexity	Formula	Description
Simple	$PM = 2.4\ (KDSI)^{1.05} \times M$	Well-understood applications developed by small teams
Moderate	$PM = 3.0\ (KDSI)^{1.12} \times M$	More complex projects where team members may have limited experience of related systems
Embedded	$PM = 3.6\ (KDSI)^{1.20} \times M$	Complex projects where the software is part of a strongly coupled complex of hardware, software, regulations and operational procedures

Sub Models Of COCOMO II Model

- Application composition model – Assumes that systems are made from reusable components, database programming. Software size estimate is based on application points
- Early design model – Used during early stages of system design after requirements have been established. Estimates are based on function points which are then converted into lines of code
- Reuse model – Used to compute effort required to integrate reusable components or program code automatically generated by software
- Post architecture model – Used after system architecture has been designed
- The following figure shows COCOMO II sub models and where they are used

COCOMO II Models