Group 120

Basic COCOMO Model

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Introduction

- This presentation will illustrate COCOMO Basic Model, covering the equation, using an example.
- Link COCOMO https://fcmconfig-d7f91.web.app/#/

Example

An assumption that we have a feature on the system which has:

Java Language

3 input items

2 output items

3 entity types accessed

First:
Function points

- Equation:
  FP count = (N_i * 0.58) + (N_e * 1.66) + (N_o * 0.26)
- **N_i: the Numbers of input data [i.e. username, password and email]**
- **N_o: the Numbers of output data [i.e. Registered successfully, username already exists]**
- **N_e: [front end, backend and database]**
- **All the red numbers are Constance.**

Solution:

- **FP count = (3 * 0.58) + (3 * 1.66) + (2 * 0.26) = 7.42**

Second:
Estimated Size

- Equation:
- **Estimated Size = FP * (53 / 1000)**
- **We will change the green value depending on the code language as per below table.**

Language	Default SLOC / UFP	Language	Default SLOC / UFP
Access	38	Jovial	107
Ada 83	71	Lisp	64
Ada 95	49	Machine Code	640
AI Shell	49	Modula 2	80
APL	32	Pascal	91
Assembly - Basic	320	PERL	27
Assembly - Macro	213	PowerBuilder	16
Basic - ANSI	64	Prolog	64
Basic - Compiled	91	Query – Default	13
Basic - Visual	32	Report Generator	80
C	128	Second Generation Language	107
C++	55	Simulation – Default	46
Cobol (ANSI 85)	91	Spreadsheet	6
Database – Default	40	Third Generation Language	80
Fifth Generation Language	4	Unix Shell Scripts	107
First Generation Language	320	USR_1	1
Forth	64	USR_2	1
Fortran 77	107	USR_3	1
Fortran 95	71	USR_4	1
Fourth Generation Language	20	USR_5	1
High Level Language	64	Visual Basic 5.0	29
HTML 3.0	15	Visual C++	34
Java	53		

Solution:

- **Estimated Size = 7.42 * (53 / 1000) = 0.39326 KSLOC**

Projects Categories

- In COCOMO, projects are categorized into three types:
  - Organic: A development project can be treated of the organic type, if the project deals with developing a well-understood application program, the size of the development team is reasonably small, and the team members are experienced in developing similar methods of projects. Examples of this type of projects are simple business systems, simple inventory management systems, and data processing systems.
  - Semidetached: A development project can be treated with semidetached type if the development consists of a mixture of experienced and inexperienced staff. Team members may have finite experience in related systems but may be unfamiliar with some aspects of the order being developed. Example of Semidetached system includes developing a new operating system (OS), a Database Management System (DBMS), and complex inventory management system.
  - Embedded: A development project is treated to be of an embedded type, if the software being developed is strongly coupled to complex hardware, or if the stringent regulations on the operational method exist. For Example: ATM, Air Traffic control.

Third: Initial Efforts & Tdev

- Equation:
- **Efforts = a1 * (KDLOC) ^a2**
- **Tdev=b1*(efforts)^b2** Months
- **All the red numbers are Constance and depends on the project type.**

❑ Where

- KLOC is the estimated size of the software product indicate in Kilo Lines of Code,
- a1,a2,b1,b2 are constants for each group of software products,
- Tdev is the estimated time to develop the software, expressed in months,
- Effort is the total effort required to develop the software product, expressed in person months (PMs).

- **Solution:**

(i)Organic Mode

E = 2.4 * (**0.39326**)^1.05 = 0.9008 PM

D = 2.5 * (**0.9008**)^0.38= 2.4027 PM

- **(ii)Semidetached Mode**

E = 3.0 * (**0.39326**)^1.12= 1.0548 PM

D = 2.5 * (**1.0548**)^0.35= 2.5471 PM

- **(iii) Embedded Mode**

E = 3.6 * (**0.39326**)^1.20 = 1.1747 PM

D = 2.5 * (**1.1747**)^0.32 = 2.6321 PM

Thank You

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