

COCOMO

- ① Cocomo stands for construct
- ② It is used for determining the cost of a 'S/W' project.
- ③ There are different types or parts are cost.
 - a) Effort
 - b) Time.

c) Human Resource

d) Money.

iv) there are three types of

a) Organic

b) Semi detached

c) ~~Embechth~~ embedded

Size of the Product:

0 — 5K LOC

>5 — ≤ 300K LOC

> 30K LOC

Formula:

$$1) E_i = a * (KLOC)^b$$

S/m	a	b
org	3.2	1.05
S-d	3.0	1.12
embed	2.8	1.20

E_i = Initial Effort.

• KLOC = Size of the project.

P = person

M = month

$$ii) EAF = f(*, m)$$

$$m = (m_1, m_2, \dots, m_{15})$$

Effort + adjustment factor = $f(*, m)$

* = operand / multiplying function.

E_f stands for final effort.

IV) $t_D = C * (E_f)^d$ month

S/m	a	b	c	d
org	3.2	1.05	2.15	3.8
S-d	3.0	1.12	2.5	3.5
embol	2.8	1.20	2.5	3.2

V) Staffing size = $\frac{E_f}{t_D}$, persons in a team.

VI) total development

cost = (time) * [dev. cost per unit time]
 money

VII) Productivity $\phi = \frac{(\text{size})}{\text{time effort}}$, KLOC/P-M

VIII) $FVA = F = P(1+i)^n$ money

FVA consist Future Value Analysis.

n = no. of years.

P = present value

F = Future value analysis.

i = interest rate

The relation bⁿ KLOC & Mod_k

For C lang, KLOC : FPA = 128:1

128

1

In a S/W project there are following phases with corresponding documentation. Planning = 500 KLOC, analysis = 250 KLOC, Design = 200 KLOC, Coding = 600 KLOC, testing = 300 KLOC, Maintenance = 150 KLOC

The different attributes of the project are given; complexity = 1.25, efficiency = 75% reliability = 80% and efficacy = 1.50

The development cost for the project is given 2000 int/day. Apply cocomo for the above project.

500	500	} total size
250	250	
200	200	
600	600	
300	300	
150	150	
00	2000 KLOC	

$$\therefore \frac{2000}{1000} \text{ KLOC} = 2 \text{ KLOC}$$

1) Organic:

$$E_i = a * (KLOC)^b \cdot P-M$$

$$= 3.2 \times (2)^{1.05} = 6.625$$

Semi-Defected.

$$E_i = 3.0 \times (2)^{1.12} = 6.52$$

Embedded

$$E_i = 2.8 \times (2)^{1.20} = 6.43 \text{ P-M}$$

2) ~~Semi-Defected~~

$$EAF = f(*, m)$$

$$= 1.25 \times \frac{80}{100} \times \frac{75}{100} \times \frac{80}{100} \times 1.50$$

$$3) E_f = EAF * E_i \text{ PM}$$

$$= 1.125 * [3.2 * (2)^{1.05}] \text{ PM}$$

$$= 1.125 * 6.625 = 7.45 \text{ PM}$$

$$4) t_d = C * (E_f)^d$$

$$= 1 * [1.125 * \{3.2 * (2)^{1.05}\}]^2 = 55.50 \text{ months}$$

$$5) \text{ Staffing size} = \frac{E_f}{t_d}$$

$$= \frac{7.45}{55.50} = 0.134 \text{ size}$$

$$6) \text{ Total Development cost}$$

$$= 55.50 * 30 * 2000$$

$$= 3330000 \text{ cost.}$$

$$7) \text{ Productivity Size:}$$

$$\text{Productivity size} = \frac{\text{Size}}{\text{Effort}}$$

$$= \frac{2}{7.45} \text{ KLoc/P-M}$$

$$= 0.268 \text{ KLoc/PM}$$

$$8) \text{ FVA:}$$

$$\text{FVA} = F = P(1+i)^n \text{ money.}$$

$$= 3330000(1+10)^{4.625}$$

$$= 3330000 * (11)^{4.625}$$

$$n = \frac{55.50}{12}$$

$$= 4.625$$

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5 Value of the constants in COCOMO.

1. Organic : 2 to 50 KLOC
2. Sem-Detached : > 50 KLOC to ≤ 300 KLOC
3. Embedded : > 300 KLOC

MODEL	a	b	c	d
Organic	3.2	1.05	2.5	0.38
Sem-Detached	3.0	1.12	2.5	0.35
Embedded	3.6	1.20	2.5	0.32

$$t = P(1+i)^n = P = \frac{F}{(1+i)^n}$$