Experiment no: 2

Date: 15-10-21

Aim: - Using COCOMO Model estimate effort.

Procedure: -

The Cocomo model uses a multivariable size estimation model for effort estimation

size is measured in KLOC (thousand delivered lines of code) per person-month (PM). The constants a and b are derived from historical data of past projects cocomo estimation is a family of hierarchical models which include

- 1 Basic Cocomo model
- 2, Intermediate COCOMD Model
- 3, Detailed COCOMO Model.

Basic Cocomo Model:

Development effort (E) = a x (kloc) b Let us consider the size (total) of modules is 7 kloc Online data entry - 1.0 kloc

Data update - 2.0 KLDC

file Input and Output - 1.5 KLOC 0.38

Development time (T) = CX (E) = 2.5 x (24.6889)

= 8.4546 months

The values of a and b in the cocomo model vary across three categories of projects: organic, semidetached and embedded

Project category	a	Ь
organic semi detached embedded	3· D 2·8	1.05 1.12 1.20

Organic projects are very simple and can be developed with a small size team

Embedded projects are very complex and have stringent

constraints

semidetached projects are intermediate in size and complexity

Development time (+) = Cx (E)

The c,d for organic, semidetached and embedded-type projects are given by

C	d	
2.5	0.38	
2.5	0.35	
2.5	0.32	
	2.5	

COST DRIVERS AND THEIR VALUES

cost drivers	Ratings					
	very	low	Hominal	High	very high	extra high
Product attributes						
software reliability (PELY)	0.45	0.88	1.00	1.15	1.40	-
size of database (DATA)	_	6.94	1.00	1.08	1.16	-
product complexity (CPLX)	0F.0	0.85	1,00	1.15	1:30	1.65
Hardware attributes						
Runtime performance	-2	_	1.00	1.11	סציו	1,66
Memory storage constraints	_	_	1.00	1.06	1.21	1.56
(STORE)		2.07	1.00	1.15	1.25	
virtual machine volatility	_	0.84	1.00	1-13	1:30	
Required two about time (TURN)	-		1.00	1.07	1.12	-
personnel attributes				3.00	0.31	
Analyst capability (ACAP)	1.46	1,19	100	0.86	0.41	
Applications experience (AEXP)	1.29	1.13	1.00	0.91	0.82	
programmer capabluty	1.42	1.14	1.00	0.86	0.4d	/-
virtual machine experience	1.21	1.10	1.00	0.90	-	
Programming language experience (LEXP)	1-14	1.07	1.00	0.95	-	-
project attributes				0101		
Modern programming practices (Mos	1024	1,10	1-00	0.91	0.82	-
use of software tools (TOOL)	1.24	1.10	1.00	0.91	0.83	-
pevelopment schedule	1,23	1.08	1.00	404	1.10	-

library reports - 20 KLOC Query and search - 0.5kloc Total size - 7. KLOC

It comes under Organic projects, Gramples of this type of projects are simple business systems, simple inventory management systems

Development effort = ax(kloc) = 3.2x(7) 24.6889 PM

Intermediate COCOMO Model:-

(Ei) Initial effort = ax (kloc)

EAF-effort adjustment factors EAF = EAFI X EAF2 X - - EAFN

Initial effort = 3.2 x (7) = 24.6889 PM

(E EAF = 1.12 X 1.00 X 0.1 X 1.00 X 1.51 X 1.00 X 1.00 X1.00 X 1.00 X 1.00 X 1.10 X 1.07 X 1.00 X

1.00 K 1.00

= 1.0422

(E) Total effort = EIX EAF = 94.6889 x 1.0422

- 25.7307 PM

Development time = CX(E)d = 8.4546 months

PHASE-WISE DISTRIBUTION OF THE DEVELOPMENT EFFORT AND TIME

Project type and size	plan and requirement	system design	petailed design	code and unit	Integration and Test
Percentage-wice distribution organic (2KLOC) effort	6	16	26	u2	16
organic (32×Loc)	6	16	24	38	22
semidetached (22klox)	7	17	25	33	25
semidetached (128ktoc)	7	17	24	31	28
Embedded (128KLOC)	8	18	25	26	31
embedded (320 kLOC)	8	18	24	24	34
percentage—wise distribution of development time					
Organic (2xLOC)	10	19	24	39	18
organic (32kloc)	12	19	21	34	26
cemidelached (32kloc)	20	26	21	27	26
cemidetached (128 KLOC)	22	27	19	25	
Embedded (128 KLOC)	36	36	18	18	28
Embedded (320 KLOC)	40	38	16	16	30

Detailed COCOMO Model:-

The total estimated effort (E)= 25.7307 PM

The total size = 7 KLOC

The phase-wise development effort =

plan and requirement (%)= 6+ (6-6) /(32-2) x7

= 6%

Effort = 0.06x 25.7 B07 PM

= 1.5438PM

aystem design = $16+(16-16)[(32-2) \times 7 = 16\%$

Chort = 0.16 x 25.7307 = 4.116912-by

Detailed design = 24+ (26-24) / (32-2) x7 = 25%.

ellort = 0.25 x 25.7307 PH

= 6.4327 PM

code and unit test = 38 + (42 - 38) (32-2) X7 = 39/1.

Effort > 0.39 x 25.7307 PM = 10.0350

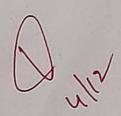
Integration and test = 22 + (16-22) | (32-2) x7

= 24 %

= 0.24x 25.7307 = 6.1754

Development time (T)= 2.5 x(E) months

= 8.4246 months



FAR's :-

- Why do we need effort estimation?
- Di What are the disadvantages of using cocomo for effort estimation
- (3) What is the difference between cocomo and function point
- a) What is the unit for effort estimation in cocomo?
- 6 How intermediate cocomo Model different from basic cocomo Model?