JEWELLERY SHOP MANAGEMENT SYSTEM

PROJECT ESTIMATION

Estimation Methods :

- LOC based
- Function based
- COCOMO Model

- ### LOC BASED ESTIMATION:

As the name suggest, LOC count the total number of lines of source code in a project. It is simple to use.

The disadvantages of this method of estimation are,

- Different programming languages contains different number of lines.
- No proper industry standard exist for this technique.
- It is difficult to estimate the size using this technique in early stages of project.

LOC based estimation for Jewellery Management System

Total No of lines in Project = 15000

FUNCTION	ESTIMATED LOC
User interface	1900
2D geometric analysis	2500
3D geometric analysis	2350
Database management	1600
Graphic display facilities	2750
I/O control function	1900
Analysis function	2000
Total estimated LOC	15000

- **FP BASED ESTIMATION : (FUNCTION POINT ANALYSIS)**

In this method, the number and type of functions supported by the software are utilized to find FPC(function point count). The steps in function point analysis are:

- Count the number of functions of each proposed type.
- Compute the Unadjusted Function Points(UFP).
- Find Total Degree of Influence(TDI).
- Compute Value Adjustment Factor(VAF).

- Find the Function Point Count(FPC).

Function belongs to following 5 types :

- Data Functions

  * Internal Logical Files(ILF)

  * External Interface Files(ELF)

- Transactional Functions

  *External Inputs(EI)

  *External Outputs(EO)

  *External Inquiries(EQ)

Function Point Analysis for Jewellery Management System :

- Unadjusted Function Point contribution :

TRANSFER FUNCTIONS	FIELD TYPE/FIELD INVOLVED	FTRs	DETs	COMPLEXITY	UFP
Search(EQ)	Fields : Search by code or name, item code,name,material,quantity,weight,karat File : Item	1	5	Low	3
View(EQ)	Fields : Category, item code,name,material,quantity,weight Range,karat File : Item	2	6	Low	3

Add jewellery items(EI)	Fields : Category, item code,name,material,quantity,weight Range,karat File : Item	2	9	Average	4
Caluculate Bill (EI)	Fields Customer id,name,weight,making charges,current rate,discount,net amout File :Order	1	6	Average	4
Remove items(EQ)	Fields : item code,availability,delete File : Item	1	6	2*Low	6
				Total	20

DATA FUNCTIONS	**FIELD TYPE/FIELD INVOLVED**	**FT Rs**	**DE Ts**	**COMPLEXITY**	**UFP**
Item(ILF)	Fields : Category, item code,name,material,quantity,karat	1	6	Low	7
Order(ILF)	Fields : item code,name,material	1	5	Low	7
Bill (ILF)	Fields : Item,Order	1	2	Low	7
				Total	21

- ❖ Performance and Environmental Impact :

GSC	**DI**
Data communication	2
Distributed Data Processing	2
Performance	2
Heavily used configuration	2

Transaction rate	2
Online Data Entry	2
End user Efficency	2
Online update	2
Complex processing	2
Reusability	2
Installation Ease	2
Operational Ease	2
Multiple Sites	2
Facilitate change	2
Total	**28**

VALUE ADJUSTMENT FACTOR(VAF) = (0.65+(0.01*Total))

= (0.65+(0.01*28))

= 0.93

UFP = UFP(Data Fn)+UFP(Transaction fn)

= 21+20

= 41

Adjusted Function Point Count = UFP* VAF

= 41*0.93

= 38.13

Effort = AFP * Productivity

= 38.13 *10.6

= 404.17 per hours

- **COCOMO MODEL ESTIMATION:**

CO- Constructive

CO-Cost

MO-Model (Constructive Cost Model)

*It is based on LOC(Lines of Code) where project estimation is done based on the total lines of codes required to develop the system i.e. Size of the system define the cost of the project.

*It is used to estimate the **effort,cost,development time,average staff size,productivity** etc.

* There are 3 types of Cocomo model

- 1.BASIC COCOMO MODEL
- 2.INTERMEDIATE COCOMO MODEL
- 3.DETAILED COCOMO MODEL

BASIC COCOMO MODEL :

It estimates the software roughly and quickly. It is mostly useful for small-medium sized software.

There are 3 modes of development

1)Organic -Project size(2-50 KLOC)

2)Semi-detached- Project size(50-300 KLOC)

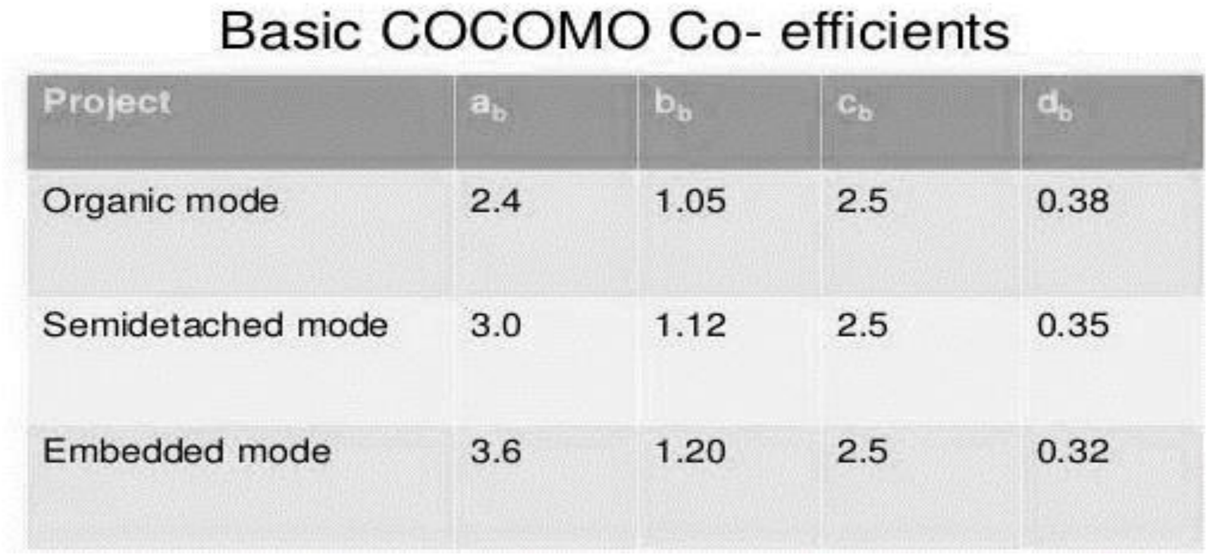
3)Embeded- Project size(Over 300 KLOC)

Effort = a(KLOC)^{b} Person-Month

Development Time = c(Effort)^{d} Months

Average Staff Size = Effort / Development time Persons

Productivity = KLOC / Effort KLOC/person-month



Basic COCOMO Co- efficients

Project	a_b	b_b	c_b	d_b
Organic mode	2.4	1.05	2.5	0.38
Semidetached mode	3.0	1.12	2.5	0.35
Embedded mode	3.6	1.20	2.5	0.32

BASIC COCOMO MODEL ESTIMATION FOR RAILWAY RESERVATION SYSTEM :

KLOC = 28

Effort = a(KLOC)^{b} Person-Month

Effort = 2.4(28)$^{1.05}$

=2.4 * 33.0762

=79 Person/Month(appx)

Development Time = c(Effort)^{d} Months

Development Time = 2.5(79)$^{0.38}$

=13.15

=13 Months(appx)

Average Staff Size = Effort / Development time Persons

Average Staff Size = 79/13 Persons

= 6 Persons(appx)

Productivity = KLOC / Effort KLOC/person-month

=28/79

=0.354(appx)

INTERMEDIATE COCOMO MODEL :

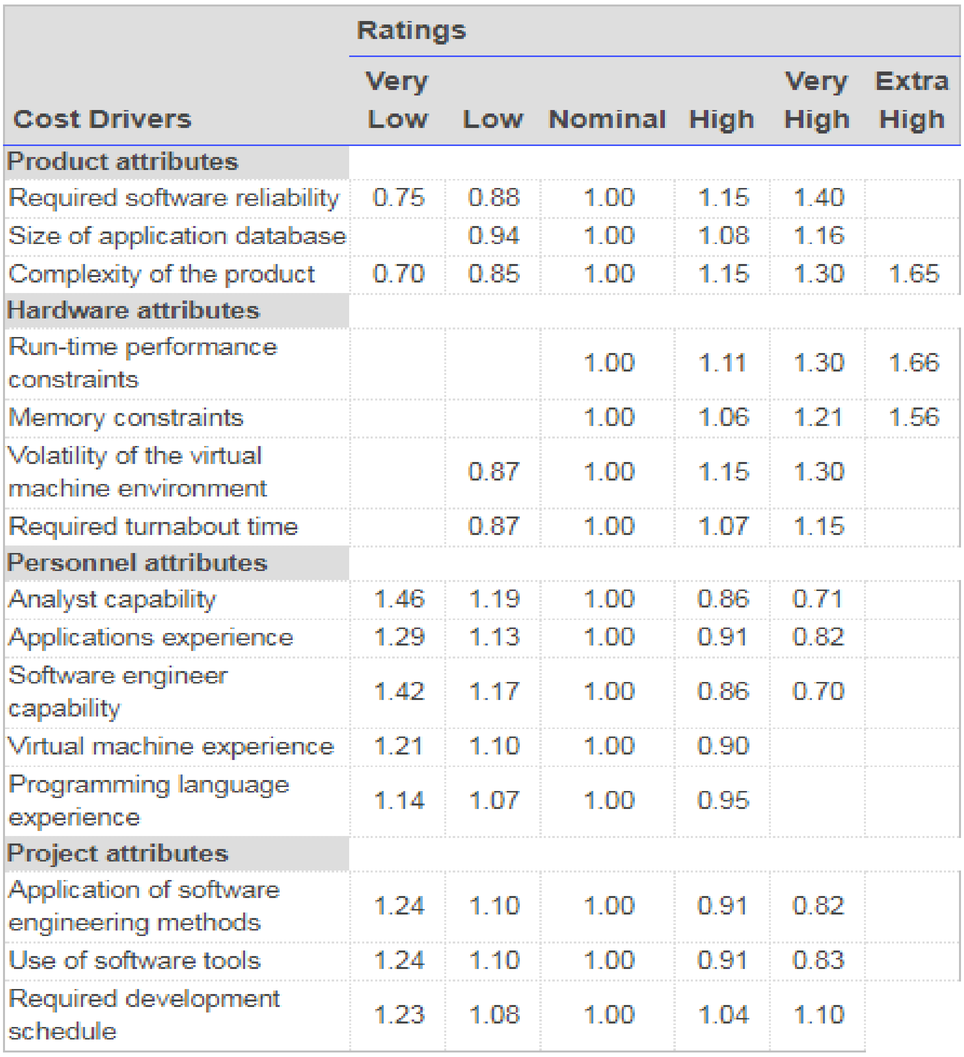
The intermediate model estimates software development effort in terms of size of the program and other related cost drivers parameters (product parameter, hardware parameter, resource parameter, and project parameter) of the project. The estimated effort and scheduled time are given by the relationship:

Effort (E) = $a*(KLOC)^b *EAF$ MM

Scheduled Time (D) = $c*(E)^d$ Months(M)

Where ,

- **E =** Total effort required for the project in Man-Months (MM).
- **D =** Total time required for project development in Months (M).
- **KLOC =** The size of the code for the project in Kilo lines of code.
- **a, b, c, d =** The constant parameters for the software project.
- **EAF =** it is an effort adjustment factor which is calculated by multiplying the parameter value of different cost driver parameters



	Ratings					
Cost Drivers	Very Low	Low	Nominal	High	Very High	Extra High
Product attributes						
Required software reliability	0.75	0.88	1.00	1.15	1.40	
Size of application database		0.94	1.00	1.08	1.16	
Complexity of the product	0.70	0.85	1.00	1.15	1.30	1.65
Hardware attributes						
Run-time performance constraints			1.00	1.11	1.30	1.66
Memory constraints			1.00	1.06	1.21	1.56
Volatility of the virtual machine environment		0.87	1.00	1.15	1.30	
Required turnabout time		0.87	1.00	1.07	1.15	
Personnel attributes						
Analyst capability	1.46	1.19	1.00	0.86	0.71	
Applications experience	1.29	1.13	1.00	0.91	0.82	
Software engineer capability	1.42	1.17	1.00	0.86	0.70	
Virtual machine experience	1.21	1.10	1.00	0.90		
Programming language experience	1.14	1.07	1.00	0.95		
Project attributes						
Application of software engineering methods	1.24	1.10	1.00	0.91	0.82	
Use of software tools	1.24	1.10	1.00	0.91	0.83	
Required development schedule	1.23	1.08	1.00	1.04	1.10	

INTERMEDIATE COCOMO MODEL FOR RAILWAY RESERVATION SYSTEM :

Given the estimated size of the project is =28 KLOC

Having high application experience =0.91

Having very low experience in programming=1.14

EAF=0.91*1.14=1.0374

Effort (E) = $3.0*(28)^{1.12} * 1.0374$ MM

=129.9823MM

Scheduled Time(D)= $2.5*(129.9823)^{0.35}$ Months(M)

=13.73 Months(M)

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