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DEPARTMENT OF COMPUTER TECHNOLOGY

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Class: TYCM-Lin

Group No:

04

Date: _____

Title of Project: A holistic approach to campus recruitment and student profile analysis for placement.

Assignment No: 4

Name of Activity (Assignment): Costing using COCOMO Model

Name: Mr. S. H. Sangale

Signature of Guide:

Step 1: Measure the size in terms of the amount of functionality in a system. Function points are computed by first calculating an unadjusted function point count (UFC).

Sr. no.	Function points	Number	Description
1	User inputs	6	Login, Add/View/Delete Company, View Student List, Approve Students, Add/View/Delete job related post, View Assessment Score
2	User outputs	4	View Student List, View Assessment Score, View Top Candidate, Result declare (Email send)
3	User requests	9	Add/View/Delete Company, Approve Students, Add/View/Delete job related post, Add/View/Delete Job Post, Conduct Quiz (The Big-5 Personality Traits), Track Status of Placement
4	Internal Files	1	Database
5	External interfaces	1	Naive Bayes algorithm (for prediction/classification)

Step 2: Multiply each number by a weight factor according to complexity of the parameter, associated with that number.

Complexity considered is average.

Sr. no.	Function points	Number	Weight Factor	Multiplication
1	User inputs	6	4	24
2	User outputs	4	5	20
3	User requests	9	4	36
4	Internal Files	1	10	10
5	External interfaces	1	7	7

Step 3: Calculate the total UFP (Unadjusted function points) by adding the multiplication column in above table

$$\text{UFP} = 24+20+36+10+7$$

$$\text{UFP} = 97$$

Step 4: Calculate the total TCF (Technical Complexity Factor) by giving a value between 0 and 5

Sr no.	Technical Complexity Factor	Value
1	Data communication	5
2	Distributed Data Processing	5
3	Performance criteria	4
4	Heavily Utilized Hardware	0
5	High Transaction Rates	3
6	Online Data Entry	3
7	Online Updating	2
8	End user efficiency	4

9	Complex Computations	5
10	Reusability	4
11	Ease of Installation	5
12	Ease of Operation	5
13	Portability	4
14	Maintainability	4

Step 5: Sum the resulting numbers to obtain DI (degree of influence) by adding the value column in above table
 $DI = 53$

Step 6: TCF (Technical Complexity Factor) by given formula

$$\begin{aligned}
 TCF &= 0.65 + 0.01 * DI \\
 &= 0.65 + 0.01 * 53 \\
 &= 1.18
 \end{aligned}$$

Step 7: Calculate FP (Function Points) using the given formula

$$\begin{aligned}
 FP &= UFP * TCF \\
 &= 97 * 1.18 \\
 &= 114.46
 \end{aligned}$$

Step 8: To find KLOC (Lines of code) using language factor and FP

Approximating codebase % for java = 45%
 Approximating codebase % for html = 35%
 Approximating codebase % for css = 19.5%
 Approximating codebase % for js = 0.5%

Language factor for java = $24 * 0.50$
 Language factor for HTML = $34 * 0.35$
 Language factor for CSS = $25 * 0.195$
 Language factor for js = $47 * 0.05$

LOC = Language factor * FP
 $LOC_JAVA = 24 * 0.50 * 114.46 \Rightarrow 1373.52$
 $LOC_HTML = 34 * 0.35 * 114.46 \Rightarrow 1362.07$
 $LOC_CSS = 25 * 0.195 * 114.46 \Rightarrow 557.99$
 $LOC_JS = 47 * 0.05 * 114.46 \Rightarrow 268.98$

$LOC = LOC_JAVA + LOC_HTML + LOC_CSS + LOC_JS$
 $= 1373.52 + 1362.07 + 557.99 + 268.98$
 $LOC = 3562.56$

$KLOC = LOC / 1000$
 $KLOC = 3.56$

Step 9: To calculate the effort and nominal development time using given formula and constants

Effort = $a_1 * (KLOC)^{a_2} PM$
 $Tdev = b_1 * (Effort)^{b_2} Months$
 Development mode considered is Organic.

Values of the constants in the Organic Development mode:

$$a_1=2.4$$

$$a_2=1.05$$

$$b_1=2.5$$

$$b_2=0.38$$

$$\text{Effort} = 2.4 * (3.56)^{1.05} = 9.10 \text{ PM}$$

$$T_{\text{dev}} = 2.5 * (9.10)^{0.38} = 5.8 \text{ Months}$$

Step 10: Calculate the cost required to develop product by multiplying development time and average salary of engineers

Average salary is 3000

$$\begin{aligned} \text{Cost required to develop the product} &= 5.8 * 3000 \\ &= 17400 \text{ RS} \end{aligned}$$

Hence, the total cost required to develop the product is ₹17,400/-