

Project Size Estimation

Function Point Analysis (FPA)

Breakdown of functionality in system:

Functionality	Input	Output	Queries	File	Interface
Review course	2	2	1	2	1
Upload material	1	1	0	1	1
Organize material	3	2	1	2	1
Search Material	1	1	1	3	1
Anonymize name	0	1	0	0	0
Add profile pic	1	0	1	1	1
Award credit	1	0	1	1	0
Download material	2	1	2	1	1
Preview material	1	2	2	1	1
Add user info	4	0	0	1	1
Recommend class	0	1	4	4	1

Complexity multiplier grid:

	Low	Medium	High
Input	*3	*4	*6
Output	*4	*5	*7
Queries	*7	*10	*15
File	*7	*10	*15
Interface	*5	*7	*10

Total Unadjusted Function Points (TUFP):

	Complexity				
Description	Total#	Low	Medium	High	Total
Input	16	5*3	3*4	6*6	63
Output	11	5*4	2*5	4*7	58
Queries	13	6*7	4*10	3*15	127
File	17	13*7	2*10	2*15	141
Interface	9	3*5	5*7	1*10	60
Total Unadjusted Function Points:					449

Total Processing complexity (PC):

Task	Complexity (0-3)
Data communication	2
Team cohesion	1
Complex processing	2
On-line data entry	1
End-user efficiency	1
Familiarity with technology	3
Total Processing Complexity (TPC)=	10

Note: Tasks with zero complexity are omitted.

Adjusted processing complexity (APC):

$$APC = 0.65 + (0.01 * TPC)$$

$$APC = 0.65 + (0.01 * 10) = 0.75$$

The total Adjusted function points (TAFP):

$$\text{TAFP} = \text{TUFP} * \text{APC}$$

$$\text{TAFP} = 449 * 0.75 = 336.75$$

Converting Function Points to Line Of Code (LOC):

Example reference:

Language/Tool	Number of LOC/FP
HTML	15
Python	30
Javascript	55
Packages(Flask, React)	20

30% Will be done in HTML

40% Will be done in Python

10% Will be done in Javascript

20% Will be done through packages (Flask, React)

Number of lines of code (LOC):

$$\text{LOC} = \text{TAFP} * \# \text{ of(LOC/FP) } * \%$$

$$\text{For HTML} = (336.75) * (15) * (30/100) = 1515.38 \text{ LOC}$$

$$\text{For Python} = (336.75) * (30) * (40/100) = 4041 \text{ LOC}$$

$$\text{For Javascript} = (336.75) * (55) * (10/100) = 1852.13 \text{ LOC}$$

$$\text{For Packages} = (336.75) * (20) * (20/100) = 1347 \text{ LOC}$$

$$\text{So the total LOC} = 8755.51 \text{ LOC}$$

Utilizing the COCOMO effort model to estimate effort.

Standard model for Effort in Person months. (Application Programs)

PROJECT	<i>a</i>	<i>b</i>
Application Programs	2.4	1.05
Utility Programs	3.0	1.12
System Programs	3.6	1.20

$$E = a * (KLOC)^b$$

Estimating the effort:

$$\text{Effort} = 2.4 * (\text{LOC}/1000)^{1.05}$$

$$= 2.4 * 9.76$$

$$= \mathbf{23.42 \text{ person month}}$$

PROJECT	<i>c</i>	<i>d</i>
Application Programs	2.5	0.38
Utility Programs	2.5	0.35
System Programs	2.5	0.32

$$T_{dev} = c * (E)^d$$

Estimating the schedule time:

$$\text{Time} = 2.5 * (23.42)^{0.38}$$

$$= 2.5 * (23.42)^{0.38}$$

$$= \mathbf{8.29 \text{ months}}$$

Estimating the number of persons:

$$\text{average of \# of persons} = 23.42/8.29$$

$$= 23.42/8.29$$

$$= \mathbf{2.83 \text{ persons}}$$