

Cost Estimate: Los Portales

Issued to: Dr. Edgar Eduardo Ceh Varela

Organization: Theater Los Portales

1500 S Avenue K Portales, NM 88130

Contents

Issued to: Dr. Edgar Eduardo Ceh Varela	1
Organization: Theater Los Portales.....	1
1500 S Avenue K Portales, NM 88130	1
General System Characteristics	3
Unadjusted Function Point (UFP) Calculation	3
Value Adjustment Factor Calculation.....	4
Adjusted Functional Points Calculation.....	4
Lines of Code Calculation	4
Additional Costs:	4
Total Cost Calculation	4

General System Characteristics

The list below provides 14 General System Characteristics that any piece of software may use. Each category is rated from 0-5. Below is a table of the 14 characteristics with the rank. Also provide is the table explain each software characteristic and ranking.

General System Characteristic	Rank
Data Communications	3
Data Processing	4
Performance	0
Heavily Used Configuration	0
Transaction Rate	0
Online Data Entry	0
End-User Efficiency	2
Online Update: 0	0
Complex Processing: 0	0
Reusability	1
Installation Ease	0
Operational Ease	0
Multiple Sites	0
Facilitate Change	0

Unadjusted Function Point (UFP) Calculation

The UFP provides a basic calculation of the systems requirements that the user will use. Essentially it is a way to score the system based on the needs of user and how the system will interact with the user.

Function Type	Count		Complexity	Total
External Inputs	12	x	3	36
External Outputs	3	x	5	15
External Enquired	1	x	4	4
Internal Logic Files	1	x	7	7
External Interface Files	1	x	10	10
Count Total				72

Value Adjustment Factor Calculation

The Value Adjustment Factor (VAF) is based on the 14 General System's Characteristics in Section One. The equation is: $VAF = 0.65 + [\frac{\sum_{i=1}^{14} C_i}{100}]$.

$$VAF = 0.65 + (0.01 \times 10) = 0.75$$

Adjusted Functional Points Calculation

The calculation for the adjusted functional points (AFP) follows the equation: $AFP = UFP \times VAF$.

Calculation: $AFP = 72 \times 0.75 = 54$

Lines of Code Calculation

It is important we estimate how many lines of code the software developers will need to code. This excludes any pre-generated code from an Integrated Development Environment (IDE) and any Application Programming Interface (API). The equation is: $LOC = AFP \times SLOC$, where the SLOW is derived from the function point languages table provide here:

<https://www.qsm.com/resources/function-point-languages-table>

$$LOC = 54 \times 54 = 2916$$

Additional Costs:

Additional costs can cover infrastructure, training, equipment, etc. The client will need the following:

- i. Cloud Hosting Provider (includes https) \$49 month
- ii. Training = 6750

Total Cost Calculation

The total cost calculation is based on the Constructive Cost Model (COCOMO). It is an algorithmic model, and the cost is estimated by the lines of code the programmers will code. The model of this calculation follows a basic model with we only use lines of code to estimate the cost. The type of project is an organic project which entails less than 50k lines of code, a small project, a project that is specific to the client. Below is the cost model with the final estimated cost.

Basic Model:

Effort = $E = a(KLOC)^b$ (person/month)

Time = $T = c(E)^d$ (months)

Average Staff Size = $P = E/T$ (persons)

Productivity = $Pr = LOC / E$ (LOC/person_month)

Cost = $C = (E \times \$\$_{person_month}) + other_costs$

Software Project	a	b	c	d
Organic	2.4	1.05	2.5	0.38

Lines of code rounded: 2.9 KLOC

Effort= $E = 2.4(2.9)^{1.05} = \text{approx. } 7.3 \text{ person/month}$

Time= $T = 2.5(7.3)^{0.38} = 5.3 \text{ months}$

Average Staff Size= $P = 7.3/5.3 = 1.4 = 1 \text{ person}$

Productivity= $Pr = 2916/4.4 = 662.7 \text{ LOC/month}$

Cost= $C = (7.3 * 6750) + 6799 = \underline{\underline{\$56,074}}$