**Software Engineering: 1ST MILESTONE**

**FP Calculation:**

**Number of external inputs (EIs):**

Play/Pause Function (1), Alan Button Tap (1), Alan Voice Input (1), Side Bar swipe (1) , Song Card Swipe (1)

**Number of external outputs (EOs):**

Song Playback (1), Alan Bot Replies (1), Alan Track Play (1), Show All Song Titles/Pictures (1), Change Tracks (1)

**Number of external inquiry (EQs):**

Tap to play particular track from Web (1), Alan searching for commands in Alan API (1), Alan Track Search (1), Get track image/title from Web for sidebar and main menu (1), Alan Track Play (1)

**Number of Internal Logical Files (ILFs):**

System Configuration File (1)

**Number of external interface files (EIFs):**

Alan API (1), Music Streaming Website (1), Web for Track image (1)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Information Domain Values** | **Count** |  | **Weighing Factor** |  | **FP COUNT** |
|  |  | **Simple** | **Average** | **Complex** |  |
| Number of external inputs (EIs) | **5** | **3** | **4** | **6** | **5x3 = 15** |
| Number of external outputs (EOs) | **5** | **4** | **5** | **7** | **5x4 = 20** |
| Number of external inquiry (EQs) | **5** | **3** | **4** | **6** | **5x4 = 20** |
| Number of Internal Logical Files (ILFs) | **1** | **7** | **10** | **15** | **1x7 = 7** |
| Number of external interface files (EIFs) | **3** | **5** | **7** | **10** | **3x5 = 15** |
| ΣFP count (Total) |  |  |  |  | **77** |

* Does the system require reliable backup and recovery? 2
* Are data communications required? 2
* Are there distributed processing functions? 3
* Is performance critical? 4
* Will the system run in an existing, heavily utilised operating environment? 4
* Does the system require on-line data entry? 3
* Does the on-line data entry require the input transaction to be built over multiple screens or operations? 3
* Are the master files updated online? 2
* Are the inputs, outputs, files or inquiries complex? 3
* Is the internal processing complex? 2
* Is the code designed to be reusable? 5
* Are conversion and installation included in the design? 2
* Is the system designed for multiple installations in different organisations? 5
* Is the application designed to facilitate change and ease of use by the user? 4

***FP = count total x (0.65 + 0.01 x ∑Fi)***

*FP = 77 x (0.65 + (0.01 x 44))*

*FP = 77 x (0.65 + 0.44*)

*FP = 77 x (1.09*)

*FP = 83.94 = 84*

**LOC Calculation using FP:**

One FP translate 60 LOC

84X60 = 5040 LOC or 5.04KLOC

12FP produced one person-month effort

84/12 = 7 person-month effort

**FP Based COST Estimation**

Historical data indicates the organization can produce 7 FP/pm

Labor rate is $ 2500/month

Cost / FP = 2500/7 =$ 357.00

Hence the cost of the project is

= ΣFP count \* [0.65 + .01 \* ΣFi]

= 77 \* (0.65 + 0.01 \* 44)

= 84 \* $357 = $29,988

Hence the effort of the project is

= 84 / 7 = 12 person/months

**COCOMO Calculation:**

**The basic COCOMO equation for effort (E) in staff-months (SM) is:**

Effort (SM) = 2.4(KLOC)1.05 = 2.4(5.04)1.05 = 2.4(5.46452) = 13.11 = 13 staff-months

**Development time (TDEV):**

TDEV = 2.5(13)0.38 = 2.5(2.65) = 6.62 = 7 months

**The average number of staff members (S):**

Staff = Effort/TDEV = 13 staff-months/7 months = 1.85 = 2 staff members on average

**The productivity rate (P):**

Productivity = Size/Effort = 5040 LOC/ 13 staff-months = 388 LOC/staff-month

**LOC Based COST Estimation**

|  |  |
| --- | --- |
| **Functions** | **Estimated Loc** |
| User interface and control | 600 |
| Alan API | 400 |
| Radio controlling/Functionality | 300 |
| External links file (mp3) | 200 |
| Design analysis modules | 500 |
| Peripheral control | 200 |

Historical data indicates the organization can produce 420 LOC/pm

Labor rate is $ 6000/month

Cost / LOC = 22000/420 =$ 14.00

Hence the cost of the project is

= (600 + 400 + 300 + 200 + 500 + 200)/420

= $2200\* $14 = $30,800

Hence the effort of the project is

= 2200/ 420 = 5 person/months