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**Experiment No. 7B**

**Aim :** To estimate the cost of a project using software metrics (FP analysis).

# Theory :

Allan J. Albrecht initially developed function Point Analysis in 1979 at IBM and it has been further modified by the International Function Point Users Group (IFPUG). FPA is used to make an estimate of the software project, including its testing in terms of functionality or function size of the software product. The functional size of the product is measured in terms of the function point, which

is a standard of measurement to measure the software application. The basic and primary purpose of the functional point analysis is to measure and provide the software application functional size to the client, customer, and the stakeholder on their request. Further, it is used to measure the software project development along with its maintenance, consistently throughout the project irrespective of the tools and the technologies.

Following are the points regarding FPs:

FPs of an application is found out by counting the number and types of functions used in the applications. Various functions used in an application can be put under five types, as shown:

| **Measurements Parameters** | **Examples** |
| --- | --- |
| Number of External Inputs (EI) | Input screen and tables |
| Number of External Output (EO) | Output screens and reports |
| Number of external inquiries (EQ) | Prompts and interrupts. |
| Number of internal files (ILF) | Databases and directories |
| Number of external interfaces (EIF) | Shared databases and shared routines. |

**Function Point Analysis :**

| **No.** | **Count** |
| --- | --- |
| No. of User Input | 50 |
| No. of User Output | 40 |
| No. of User Enquiries | 35 |
| No. of User Fills | 06 |
| No. of External Interface | 04 |

To calculate Function Point Value = **FP(value)**

| **Function Type** | **Simple** | **Average** | **Complex** |
| --- | --- | --- | --- |
| External Input | 3 | 4 | 6 |
| External Output | 4 | 5 | 7 |
| External Inquiry | 3 | 4 | 6 |
| External Logical Files | 7 | 10 | 15 |
| External Internal Files | 5 | 7 | 10 |

**Unadjusted FP :**

| **Domain** | **Count \* Average** | **FP Count** |
| --- | --- | --- |
| User Input | 50 \* 4 | 200 |
| User Output | 40 \* 5 | 200 |
| User Enquiry | 35 \* 4 | 140 |
| Internal Logical Files (ILF) | 06 \* 10 | 60 |
| External Internal Files (EIF) | 04 \* 7 | 28 |

**Complexity Adjustment Factor :** 3 and -14 Questions

∴ **Σ (f1)** = 14 \* 3 = 42

**FP(value)** = Total Count \* [0.65 + 0.01 + Σ (f1)]

= 628 \* [0.65 + (0.01 \* 42)]

= 628 \* [0.65 + 0.42]

= 628 \* 1.07

= 671.96

**FP(value)** = 671.96

**Productivity FP/Effort** = 408/36.9 = 11.1

**Total pages of documentation** = Technical document + User document = 265 + 122 = 387 pages

**Documentation** = Pages of documentation/FP = 387/408 = 0.94

**Cost per function** = Cost/Productivity = 7744/11.1 = $ 700