



# EXPERIMENT - 11

## Software Engineering Lab

### Aim

To Perform Estimation of effort using FP Estimation for chosen system.

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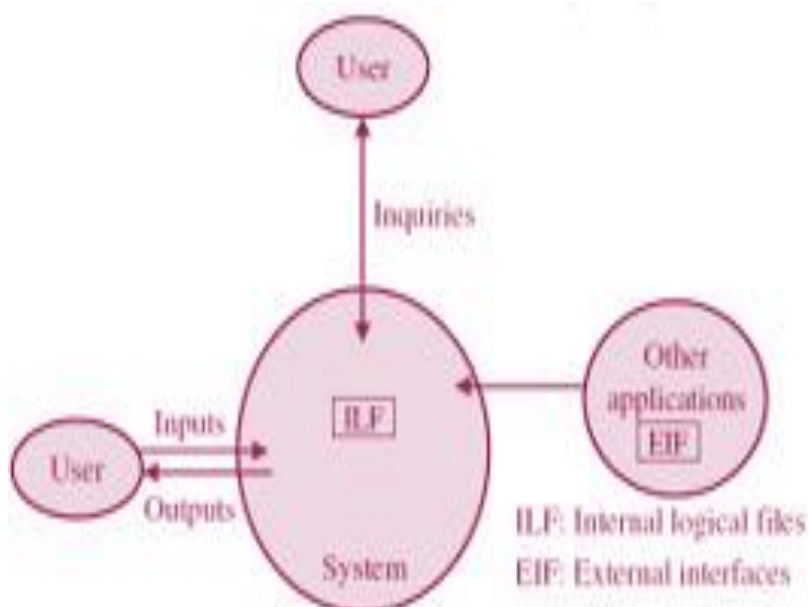
### Theory:

A **function point** is a "unit of measurement" to express the amount of business functionality an information system (as a product) provides to a user. Function points are used to compute a functional size measurement (FSM) of software.

The principle of Albrecht's function point analysis (FPA) is that a system is decomposed into functional units.

1. Inputs: information entering the system
2. Outputs: information leaving the system
3. Enquiries: requests for instant access to information
4. Internal logical files: information held within the system
5. External interface files: information held by other system that is used by the system being analyzed.

The FPA functional units are shown in figure given below:



The five functional units are divided in two categories:

(i) Data function types

- Internal Logical Files (ILF): A user identifiable group of logical related data or control information maintained within the system.
- External Interface files (EIF): A user identifiable group of logically related data or control information referenced by the system, but maintained within another system. This means that EIF counted for one system, may be an ILF in another system.

(ii) Transactional function types

- External Input (EI): An EI processes data or control information that comes from outside the system. The EI is an elementary process, which is the smallest unit of activity that is meaningful to the end user in the business.
- External Output (EO): An EO is an elementary process that generate data or control information to be sent outside the system.
- External Inquiry (EQ): An EQ is an elementary process that is made up to an input-output combination that results in data retrieval.

### **Special features**

- Function point approach is independent of the language, tools, or methodologies used for implementation; i.e. they do not take into consideration programming languages, data base management systems, processing hardware or any other data base technology.
- Function points can be estimated from requirement specification or design specification, thus making it possible to estimate development efforts in early phases of development
- Function points are directly linked to the statement of requirements; any change of requirements can easily be followed by a re-estimate.
- Function points are based on the system user's external view of the system, non-technical users of the software system have a better understanding of what function points are measuring.

Functional Units	Weighting factors		
	Low	Average	High
External Inputs (EI)	3	4	6
External Output (EO)	4	5	7
External Inquiries (EQ)	3	4	6
External logical files (ILF)	7	10	15
External Interface files (EIF)	5	7	10

### Performance Instruction:

- 1.Observe functional units and their weighting factors.
- 2.Compute them in formula to find value of UFP count.
- 3.Find value of FP by using formula.

### Output:

Consider a project with the following parameters.

(i) External Inputs:

- (a) 10 with low complexity
- (b) 15 with average complexity
- (c) 17 with high complexity

(ii) External Outputs:

- (a) 6 with low complexity
- (b) 13 with high complexity

(iii) External Inquiries:

- (a) 3 with low complexity
- (b) 4 with average complexity
- (c) 2 with high complexity

(iv) Internal logical files:

- (a) 2 with average complexity
- (b) 1 with high complexity

(v) External Interface files:

- (a) 9 with low complexity

In addition to above, system requires

- i. Significant data communication
- ii. Performance is very critical
- iii. Designed code may be moderately reusable
- iv. System is not designed for multiple installation in different organizations.

Other complexity adjustment factors are treated as average.  
Compute the function points for the project.

The functional complexities are multiplied with the corresponding weights against each function, and the values are added up to determine the UFP (Unadjusted Function Point) of the subsystem.

## Files

External Inputs Els	Eternal Outputs EOs	External Inquiries EQs	External Logic files ELFs	External Interface Files EIFs
<ul style="list-style-type: none"> <li>• Seller Signup</li> <li>• Deliverer Signup</li> <li>• Buyer Signup</li> <li>• Seller Login</li> <li>• Deliverer Login</li> <li>• Buyer Login</li> <li>• Seller signs deliverer</li> <li>• Seller assign Deliverer</li> <li>• Deliverer updates order status</li> <li>• Place order</li> <li>• Add products</li> <li>• Add to cart</li> <li>• Add address</li> <li>• Customize profile</li> <li>• Update stocks</li> <li>• Give review</li> <li>• Comment on review</li> <li>• Update product</li> <li>• Remove deliverer</li> <li>• checkout</li> </ul>	<ul style="list-style-type: none"> <li>• Get products</li> <li>• Get orders</li> <li>• Get deliverers</li> <li>• Get reviews</li> <li>• Get cart</li> <li>• Get order details</li> <li>• Get buyer details</li> <li>• Get profile</li> <li>• Get sellers</li> <li>• Search products</li> <li>• Search shops</li> <li>• Get status</li> <li>• Track order</li> <li>• Get my stock</li> <li>• Get my deliverers</li> <li>• Get assigned deliverer</li> <li>• Get history</li> <li>• get contact info</li> <li>• get product details</li> <li>• get product reviews</li> <li>• get my reviews</li> <li>• get shop reviews</li> <li>• get seller details</li> <li>• get deliverer contact</li> <li>• get payment details</li> <li>• get seller orders</li> </ul>	<ul style="list-style-type: none"> <li>• Login</li> <li>• Payment</li> <li>• Payment receipt</li> <li>• Payment verification</li> <li>• Login token</li> <li>• Wrong password</li> <li>• Customer not found</li> <li>• Seller not found</li> <li>• Buyer not found</li> <li>• Deliverer not found</li> <li>• Signed up</li> <li>• Update profile</li> <li>• Place order</li> <li>• Check out</li> <li>• Cancel order</li> <li>• Add stock</li> <li>• Update stock</li> <li>• Assign deliverer</li> <li>• Add deliverer</li> <li>• No products</li> <li>• New review</li> <li>• Order status</li> <li>• Reset credentials</li> <li>• Login expire</li> </ul>	<ul style="list-style-type: none"> <li>• Sellers</li> <li>• Buyers</li> <li>• Deliverers</li> <li>• Products</li> <li>• Reviews</li> <li>• Cart</li> <li>• Orders</li> </ul>	<ul style="list-style-type: none"> <li>• Products</li> <li>• Orders</li> <li>• Reviews</li> <li>• Deliverer</li> </ul>

Unadjusted function points may be counted using below table:

Functional Units	Count	Complexity	Complexity Totals	Functional Unit Totals
External Inputs (EIs)	20	Low * 3 Average * 4 High * 6	20 * 4	80
External Outputs (EOs)	26	Low * 4 Average * 5 High * 7	26 * 5	130
External Inquiries (EQs)	24	Low * 3 Average * 4 High * 6	24 * 4	96
External logic Files (ILFs)	7	Low * 7 Average * 10 High * 15	7 * 10	70
External Interface Files (EIFs)	4	Low * 5 Average * 7 High * 10	4 * 7	28
Total Unadjusted Function Point Count = 404				

$$\begin{aligned}\Sigma F_i &= 14 * \text{scale} \\ &= 14 * 3 = 42\end{aligned}$$

$$\begin{aligned}\text{CAF} &= (0.65 + 0.01 * \Sigma F_i) \\ &= (0.65 + 0.01 * 42) \\ &= 1.07\end{aligned}$$

$$\begin{aligned}\text{FP} &= \text{UFP} * \text{CAF} \\ &= 404 * 1.07 \\ &= 432.28000000000003\end{aligned}$$

Hence FP = 432

## Conclusion:

FP estimation was done successfully.

## Viva Questions

### 1. Explain five functional units of functional point analysis(FPA)?

Ans.

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.

### 2. Explain special features of FPA?

Ans.

1. FPs of an application is found out by counting the number and types of functions used in the applications.
2. FP characterizes the complexity of the software system and hence can be used to depict the project time and the manpower requirement.
3. The effort required to develop the project depends on what the software does.
4. FP is programming language independent.
5. FP method is used for data processing systems, business systems like information systems.
6. The five parameters mentioned above are also known as information domain characteristics.
7. All the parameters mentioned above are assigned some weights that have been experimentally determined.



### 3. Explain three weighting factors of functional units?

Ans.

A weighting factor is a weight given to a data point to assign it a lighter, or heavier, importance in a group. It is usually used for calculating a weighted mean, to give less (or more) importance to group members.

There are majorly 3 weighing Factors –

Low, High and Average and their value varies from different parameters.

Parameters	Counts	Complexity		
		<i>Low</i>	<i>Medium</i>	<i>High</i>
Number of Inputs		3	4	6
Number of Outputs		4	5	7
Number of Files		3	4	6
Number of External Interfaces		5	10	15
Number of User Inquiries		7	7	10

### 4. Explain term unadjusted function point count (UFP)?

Ans.

For each function identified above the function is further classified as simple, average or complex and a weight is given to each. The sum of the weights quantifies the size of information processing and is referred to as the Unadjusted Function points.

### 5. What are uses of function point?

Ans.

The function point is a "unit of measurement" to express the amount of business functionality an information system (as a product) provides to a user. Function

points are used to compute a functional size measurement (FSM) of software. The cost (in dollars or hours) of a single unit is calculated from past projects.

Function points are a unit of measure used to define the value that the end user derives, or the functional business requirements the software is designed to accomplish. Each application has a specific number of function points, which are used to benchmark cost and productivity or development and maintenance activity.