# Class: T.E /Computer Sem – V / Software Engineering

| Practical No: | 4 |
|---|---|
| Title: | **Calculating function points of the Project** |
| Date of Performance: | 15-08-2023 |
| Roll No: | 9769 |
| Team Members: | Soham Parab, Bryce Miranda, Sanket Mane |

| Sr. No | Performance Indicator | Excellent | Good | Below Average | Total Score |
|---|---|---|---|---|---|
| 1 | On time Completion & Submission (01) | 01 (On Time ) | NA | 00 (Not on Time) | |
| 2 | Theory Understanding(02) | 02(Correct) | NA | 01 (Tried) | |
| 3 | Content Quality (03) | 03(All used) | 02 (Partial) | 01 (rarely followed) | |
| 4 | Post Lab Questions (04) | 04(done well) | 3 (Partially Correct) | 2(submitted) | |

**Signature of the Teacher:**

**EXP 4: Function Points**

**Waste Disposal Detection:** This involves the functionality to detect when waste is disposed of into the smart bin using RPi sensors, object detection model, and pose detection model. This can be considered a complex functionality because it involves multiple components and technologies.

**Rewards System:** This includes the functionality to reward users based on the successful detection of waste disposal. It might also involve managing user accounts, points calculation, and notifications. This can be considered a medium to complex functionality, depending on the complexity of the reward rules.

**Redemption System:** The functionality to allow users to redeem their rewards. This may include cataloguing rewards, managing user requests, and updating user accounts. This can be considered a medium complexity functionality.

**Tracking Points:** Users need to be able to see their accumulated points, which would involve displaying user-specific data. This is relatively straightforward and can be considered a simple functionality.

**Location Tracking of Bins:** This functionality involves showing the locations of smart bins on a map. It may require integration with location services or APIs, but it's not inherently complex.

To calculate function points for the project:

**1. External Inputs (EI):**
   Detecting waste disposal events, Managing user accounts

  - Assign complexity weights based on your assessment:
    - Waste Disposal Detection (Assume Average Complexity): 4
    - User Account Management (if complex, assume High Complexity): 6
  - Count the number of External Inputs:
    - You might have multiple instances of waste disposal detection but consider it as one function for simplicity.
    - Let's assume you have 1 instance of User Account Management.
  - Calculate the total weighted External Inputs:
    - Total Weighted EI = (1 * 4) + (1 * 6) = 10

**2. External Outputs (EO):**
  Notifying users of rewards, Displaying user-specific data (accumulated points).

  - Assign complexity weights based on your assessment:
    - Notifications (Assume Average Complexity): 5
    - Displaying User Data (Assume Low Complexity): 4
  - Count the number of External Outputs:
    - You might have multiple instances of notifications and user data display, but consider them as one function each for simplicity.

- Let's assume you have 1 instance of each.
- Calculate the total weighted External Outputs:
- Total Weighted EO = (1 * 5) + (1 * 4) = 9

### 3. External Inquiries (EQ):
Checking the status of rewards, Checking the location of smart bins.

- Assign complexity weights based on your assessment:
  - Rewards Status (Assume Average Complexity): 4
  - Location of Smart Bins (Assume Low Complexity): 3
- Count the number of External Inquiries:
  - Assume you have 1 instance of each.
- Calculate the total weighted External Inquiries:
  - Total Weighted EQ = (1 * 4) + (1 * 3) = 7

### 4. Internal Logical Files (ILF):
User account data, Reward catalog data.

- Assign complexity weights based on your assessment:
  - User Account Data (Assume Average Complexity): 10
  - Reward Catalog Data (Assume Low Complexity): 7
- Count the number of Internal Logical Files:
  - Assume you have 1 instance of each.
- Calculate the total weighted Internal Logical Files:
  - Total Weighted ILF = (1 * 10) + (1 * 7) = 17

### 5. External Interface Files (EIF):
Integration with location services or APIs.

- Assign complexity weights based on your assessment:
  - Integration with Location Services (Assume Average Complexity): 7
- Count the number of External Interface Files:
  - Assume you have 1 instance.
- Calculate the total weighted External Interface Files:
  - Total Weighted EIF = (1 * 7) = 7

### 6. Calculate Unadjusted Function Points (UFP):
Sum the weighted counts of all five function types:
UFP = Total Weighted EI + Total Weighted EO + Total Weighted EQ + Total Weighted ILF + Total Weighted EIF
UFP = 10 + 9 + 7 + 17 + 7
     = 50 (Unadjusted Function Points)

The Fi (i=1 to 14) are value adjustment factors (VAF) based on responses to the following questions

**1. Does the system require reliable backup and recovery?**
Response: 3

**2. Are specialised data communications required to transfer information to or from the application?**
Response: 5

**3. Are there distributed processing functions?**
Response: 3

**4. Is performance critical?**
Response: 5

**5. Will the system run in an existing, heavily utilised operational environment?**
Response: 2

**6. Does the system require online data entry?**
Response: 5

**7. Does the online data entry require the input transaction to be built over multiple screens or operations?**
Response: 3

**8. Are the ILFs updated online?**
Response: 5

**9. Are the inputs, outputs, files, or inquiries complex?**
Response: 4

**10. Is the internal processing complex?**
Response: 4

**11. Is the code designed to be reusable?**
Response: 4

**12. Are conversion and installation included in the design?**
Response: 3

**13. Is the system designed for multiple installations in different organizations?**
Response: 0

**14. Is the application designed to facilitate change and ease of use by the user?**
Response: 4

Calculations: Given: $\sum (F_i) = 50$
To Calculate: FP
Formula:  1. FP= UFP*CAF
          2. CAF= 0.65 +0.01 * $\sum (F_i)$

Soln:
Soln: CAF = 0.65+0.01* $\sum (F_i)$
      CAF = 0.65+0.5
      CAF = 1.15

FP = UFP*CAF
FP = 50*1.15
FP = 57.5

The Function Point for SmartBin+ is 57.5

**Conclusion:**

The Function Point (FP) value for the SmartBin+ is 57.5. This metric reflects the system's complexity and size, by taking the factors stated above into consideration. The Function Point metric offers insightful data on the time and resources needed for platform development, testing, and maintenance.