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TE COMPS B

SE EXP 4: Calculating function points of the Project

Information Domain Value	Count		Weighting factor: Simple	Average	Complex		
External Inputs (EIs)	3	×	3	4	6	=	9
External Outputs (EOs)	3	×	4	5	7	=	12
External Inquiries (EQs)	3	×	3	4	6	=	9
Internal Logical Files (ILFs)	2	×	7	10	15	=	14
External Interface Files (EIFs)	2	×	5	7	10	=	14
Count total	→						58

Scale Factor (Scale = 4): The scale factor represents various system characteristics such as complexity, performance, and other environmental factors. a scale factor of 4 indicates a moderate level of complexity.

User Inputs (User Input = 1, Weight = 6): weight = 6 to this category because there is a single user input -To upload a crop leaf image. This input is considered simple.

User Outputs (User Output = 3, Weight = 4): weight = 4 to this category because there are three user outputs - disease detection, confidence level, and medication recommendations. These outputs are straightforward but have moderate complexity due to the variety of information presented.

User Inquiries (User Inquiries = 3, Weight = 3): weight = 3 to this category because there are three types of user inquiries - printing diagnosis, providing weather and best agricultural practices information, and analysis. These inquiries are relatively straightforward.

User Files (User Files = 1, Weight = 15): weight = 15 to this category because there is a single user file - customer data storage on cloud . These files are complex due to their nature, and handling them requires significant effort.

External Interfaces (External Interface = 3, Weight = 5): weight = 5 to this category because there are three external interfaces. These interfaces are moderately complex.

Component Assessment Factor (CAF):

CAF = (6 * 1) + (4 * 3) + (3 * 3) + (1 * 15) + (3 * 5) = 6 + 12 + 9 + 45 + 15 = 57

Applying CAF to the formula for calculating Function Points (FP):

Function point = count total* (0.65 + (0.01 * F))

F = 14 * scale = 14*4 = 56

FP = Total * (0.65 + (0.01 * F))

FP = 57 * (0.65 + (0.01 * 56))

FP = 57 * (0.65 + 0.56)

FP = 57 * 1.21

FP = 68.97 (rounded to two decimal places)

Scale

User Input = 1 6

(Crop Leaf Image is the only input uploaded by User on the Website)

User Output = 3 4

(1.Disease Detection 2.Confidence 3.Medication)

User Inquiries = 3 3

(Print diagnosis , Give Weather and best agri practices info and Analysis)

User Files = 1 15

(Customer data storage , cloud , dataset)

External Interface = 3 5

Total Count = 6*1 + 4*3 + 3*3 + 1*15 + 3*5 = 57

FP = 57 * (0.65 +(0.01*56)) = 68.97

The Function Point for Crop Disease Detection Website is 68.97

POSTLABS:

a) Critically evaluate the Function Point Analysis method as a technique for software sizing and estimation, discussing its strengths and weaknesses.

Strengths:

1. **Functionality-Centric:** Focuses on quantifying the functionality delivered by software.
2. **Technology-Independent:** Applicable to software developed in various technologies.
3. **Objective Measurement:** Provides an objective and standardized way to measure software size.
4. **Considers User Experience:** Includes both user input and output functionalities.
5. **Supports Benchmarking:** Allows organizations to build historical benchmarks for better estimation.
6. **Useful for Contract Negotiations:** Aids in defining project scope and cost in contract negotiations.
7. **Quality Control:** Encourages the delivery of high-quality software.

Weaknesses:

1. **Complexity:** Can be complex and time-consuming, especially for large systems.
2. **Expertise Required:** Requires skilled and certified professionals, which can be costly.
3. **Subjectivity in Complexity Weights:** Assigning complexity weights can be somewhat subjective.
4. **Difficulty in Early Stages:** Challenging to apply without detailed requirements.
5. **Doesn't Consider Non-Functional Requirements:** Primarily focuses on functional requirements.
6. **Dependent on User Expertise:** Heavily relies on user input and domain knowledge.
7. **May Overlook Modern Development Practices:** May not fully accommodate agile methodologies and frequent changes.

b) Apply the Function Point Analysis technique to a given software project and determine the function points based on complexity and functionalities.

1. **External Inputs (EI):**
    - User Registration (Low Complexity)
    - Upload Image for Analysis (Medium Complexity)
    - View Disease Analysis Result (Low Complexity)
2. **External Outputs (EO):**
    - Display Disease Information (Low Complexity)
    - Generate Disease Report (Medium Complexity)
3. **External Inquiries (EQ):**
    - Search for Disease Information (Low Complexity)
4. **Internal Logical Files (ILF):**
    - User Profile Data (Low Complexity)
    - Disease Database (Medium Complexity)
5. **External Interface Files (EIF):**
    - Image Upload (Medium Complexity)

Complexity Weighting:

- Low Complexity: 3 Function Points (FPs)
- Medium Complexity: 4 FPs

Function Points Calculation:

- EI: 10 FPs (2 Low + 1 Medium)
- EO: 10 FPs (2 Low + 1 Medium)
- EQ: 3 FPs (1 Low)
- ILF: 7 FPs (1 Low + 1 Medium)
- EIF: 4 FPs (1 Medium)

Total Function Points: 34 Function Points

c) Propose strategies to manage and mitigate uncertainties in function point estimation and how they can impact project planning and resource allocation.
Strategies for Managing Uncertainties in FPE:

1. **Iterative Estimation:** Refine estimates as the project progresses and more information becomes available.
2. **Use Historical Data:** Reference past project data and benchmarks for estimation.
3. **Expert Input:** Involve experienced FPE professionals for accurate assessments.
4. **Sensitivity Analysis:** Vary input parameters to understand the range of possible estimates.
5. **Scenario Planning:** Create multiple estimation scenarios for risk assessment and planning.
6. **Buffering:** Add contingency buffers to estimates to account for uncertainties.
7. **Risk Identification:** Identify and categorize potential risks associated with uncertainties.

Impact on Project Planning and Resource Allocation:

1. **Project Schedule:** Uncertainties can lead to variations in project duration, requiring flexible schedules.
2. **Resource Allocation:** Accuracy of resource allocation is impacted, requiring efficient resource management.
3. **Budget Management:** Budget deviations may occur, necessitating financial oversight.
4. **Scope Management:** Changes in project scope due to uncertainties affect resource allocation.
5. **Risk Management:** Uncertainties are tied to project risks, requiring proactive risk management.
6. **Stakeholder Expectations:** Communication with stakeholders is crucial for setting realistic expectations.
7. **Resource Flexibility:** Be prepared to reallocate resources to address changing project dynamics.
8. **Continuous Monitoring:** Regularly update FPE throughout the project lifecycle.
9. **Documentation:** Document estimation assumptions, uncertainties, and rationale.
10. **Lessons Learned:** Conduct post-project reviews to improve future FPE and project outcomes.