**Effort estimation for virtual learning environment**

1. Functional point estimation: To overcome the limitations for loc-based measurements Alan Albert proposed another size estimation technique called the function point (FP) analysis.

FP based estimation are based on following information domain values and their complexities in a particular project.

The values of each of these information domains is collected and a subjective evaluation is performed to categorize them as sample, arrange & complex.

|  |  |  |  |
| --- | --- | --- | --- |
| **weights** | | | |
| **Information domain** | **Simple** | **Arrange** | **Complex** |
| No.of inputs  No.of outputs  No.of inquires  No.of internal logical files  No.of external interfaces | 3  4  3  7  5 | 4  5  4  10  7 | 6  7  6  15  10 |

The project VLE has the information domain values as follows:

No.of inputs-5

No.of outputs-5

No.of inquires-4

No.of internal logical files-10

No.of external interfaces-1

The project VLE is a simple project. We can find FP estimation as follows:

**Unadjusted FP(UFP):** It is calculated by counting the value of each information domain and multiplying by a approximate weight.

UFP = (No.of inputs) \* weight + (No.of outputs ) \* weight + (No. of interfaces) \* weight + (No.of internal logical files) \* weight + ( No.of external interfaces) \* weight

UFP = (5\*3) + (5\*4) + (4\*3) + (10\*7) + (1\*5)

= 122

**Compute the complexity adjustment attributes (CAA):**

The CAA’s are complexity attributes that are vary from project to project. They are computed using the following relationship.

CAA = [ 0.65 + 0.01 \* ∑ CAAi ]

The complexity adjustment attributes for VLE are :

1. Need for backup and recovery
2. Online data entry
3. Online update
4. Performance critical
5. Data communication required
6. System runs in exisisting , heavily utilized operational environment
7. Code designed to be reusable
8. Application designed to facilitate change & speed of use by user
9. Multiple screens
10. Inputs , Outputs , File Complex
11. Internal Processing Complex

The values of Each of these factors is rated on a five point scale.

O – not significant

1 – incidental

2 – moderate

3 – average

4 - significant

5 – highly essential

CAA = [ 0.65 + 0.01 \* ∑ CAAi ]

= 0.65 + 0.01 \* (11\*2)

= 0.65 + 0.01 \* 22

= 0.65 + 2.2

CAA = 0.87

To calculate FP the required formula is:

FP = UFP \* CAA

= 122 \* 0.87

= 106.14

The functional point Estimation for Virtual Learning Environment = 106.14Fp.