CSE4708: Software Project Management

Unit II : Project Evaluation & Estimation

Topic: Albrecht Function Point Analysis, 3D Function Point Analysis, Exercises

Name: Manka Sharma

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Albrecht Function Point Analysis

Based on the FP measure of software many other metrics can be computed:

- Errors/FP
- $/FP.
- Defects/FP
- Pages of documentation/FP
- Errors/PM.
- Productivity = FP/PM (effort is measured in person-months).
- $/Page of Documentation.

Function Point Analysis

Albrecht Function Point Analysis

Compute the function point, productivity, documentation, cost per function for the following data:

- Number of user inputs = 24
- Number of user outputs = 46
- Number of inquiries = 8
- Number of files = 4
- Number of external interfaces = 2
- Effort = 36.9 p-m
- Technical documents = 265 pages
- User documents = 122 pages
- Cost = $7744/ month
- Various processing complexity factors are: 4, 1, 0, 3, 3, 5, 4, 4, 3, 3, 2, 2, 4, 5.

Albrecht Function Point Analysis

Measurement Parameter	Count		Weighing factor
1. Number of external inputs (EI)	24	*	4 = 96
2. Number of external outputs (EO)	46	*	4 = 184
3. Number of external inquiries (EQ)	8	*	6 = 48
4. Number of internal files (ILF)	4	*	10 = 40
5. Number of external interfaces (EIF) Count-total →	2	*	5 = 10 378

Albrecht Function Point Analysis

So sum of all f_i ($i \leftarrow 1$ to 14) = 4 + 1 + 0 + 3 + 5 + 4 + 4 + 3 + 3 + 2 + 2 + 4 + 5 = 43

FP = Count-total * [0.65 + 0.01 *$\Sigma(f_i)$]

= 378 * [0.65 + 0.01 * 43]

= 378 * [0.65 + 0.43]

= 378 * 1.08 = 408

$$\text{Productivity} = \frac{\text{FP}}{\text{Effort}} = \frac{408}{36.9} = 11.1$$

Total pages of documentation = technical document + user document

= 265 + 122 = 387pages

Documentation = Pages of documentation/FP

= 387/408 = 0.94

Albrecht Function Point Analysis

$$\text{Cost per function} = \frac{\text{cost}}{\text{productivity}} = \frac{7744}{11.1} = \$700$$

Albrecht Function Point Analysis

Differentiate between FP and LOC

FP	LOC
1. FP is specification based.	1. LOC is an analogy based.
2. FP is language independent.	2. LOC is language dependent.
3. FP is user-oriented.	3. LOC is design-oriented.
4. It is extendible to LOC.	4. It is convertible to FP (backfiring)

Exercises

- Compute the function point for the following function parameters. Consider the parameters with high weight factor. GSCs are given on the next slide.

Function Type	Estimated Count
EI	24
EO	16
EQ	22
ILF	4
ELF	2

Albrecht Function Point Analysis

General System Characteristics (GSCs)	Degree of Influence (DI) 0 - 5
1. Data Communications	2
2. Distributed Data Processing	0
3. Performance	5
4. Heavily Used Configuration	5
5. Transaction Rate	2
6. Online Data Entry	4
7. End-User Efficiency	3
8. Online Update	5
9. Complex Processing	4
10. Reusability	5
11. Installation Ease	4
12. Operational Ease	3
13. Multiple Sites	4
14. Facilitate Change	5

Albrecht Function Point Analysis

Compute the function point value for a project with the following information domain characteristics (Average Weight factor):

- Number of user inputs: 32
- Number of user outputs: 60
- Number of user inquiries: 24
- Number of files: 8
- Number of external interfaces: 2

Assume that all complexity adjustment values are average

Albrecht Function Point Analysis

- The software used to control a photocopier requires 32,000 of C and 4,200 lines of Smalltalk. Estimate the number of function points for the software inside the photocopier.

MUST READ – Uploaded on Classroom

- Pressman, Roger S., “Software Engineering – A practitioner’s Approach”, “Chapter -4: Software Process and Project Metrics”, 5th edition, pp. 116-123.

References

- Pressman, Roger S., “Software Engineering – A practitioner’s Approach”, “Chapter -4: Software Process and Project Metrics”, 5th edition.