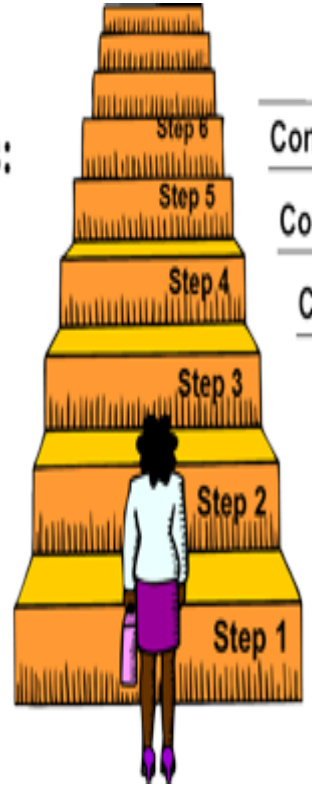
Function Points

Function Points Process

Six step process:



Convert to LOCs (optional)

Compute adjusted function points

Calculate complexity adjustment factors

Evaluate environmental factors

Estimate weight complexity

Count function points

1. Count Function Points

Group	Definition	Counting Criteria	If Missed
Outputs (Transactional)	Items of business info processed by the system for the end user (e.g. a report generated by software)	Count each unique user data control output procedurally generated that leaves the application boundary. Considered unique if it has a different format or processing logic	4–7 points
Inputs (Transactional)	Items of business data sent by the user to the system for processing and add/ delete/modify (e.g. add new customer)	Count each unique user data or control input that enters the application boundary and updates a logical internal file, data set, table, or independent data item	3–6 points
Inquiries (Transactional)	Inquiries into a DB or master file that look for specific data, use simple keys, require immediate response, and do not update	Count each unique input/output combination in which the on-line user-defined input causes & generates an immediate on-line output. Those functions failing the key-response-update test should be listed under inputs and outputs (queries)	3–7 points
Logical Files (Data)	Data stored for an application, as logically viewed by the user	Count each major logical group of user data or control info permanently maintained within the application boundary and available to users via inputs, outputs, inquiries, and interfaces (I/Fs)	24 points Is a file missing? This is a big penalty.
External Interface Files (Data)	Data stored elsewhere by another application but used by the one under evaluation	Count each major logical file within the application boundary that is sent to, shared with, or sends to another application. Count each flow of data or control info in each direction with each external entity	16 points What if you miss an I/F?

2. Estimate Weight Complexity

	Simple	Average	Complex	Function Points
# Outputs	___ x 4 =	___ x 5 =	___ x 7 =	
# Inputs	___ x 3 =	___ x 4 =	___ x 6 =	
# Inquiries[1] **Outputs** **Inputs**	 ___ x 4 = ___ x 3 =	 ___ x 5 = ___ x 4 =	 ___ x 7 = ___ x 6 =	
# Files	___ x 7 =	___ x 10 =	___ x 15 =	
# Interfaces	___ x 5 =	___ x 7 =	___ x 10 =	
			Total:	

Note [1]: select the greater of the output and input portion

3. Evaluate Environmental Factors (F_i)

1. Data communications
2. Distributed data or processing
3. Performance objectives
4. Heavily used configurations
5. Transaction rate
6. On-line data entry
7. End user efficiency
8. On-line update
9. Complex processing
10. Reusability
11. Conversion installation ease
12. Operational ease
13. Multiple site usage
14. Facilitate change

Use for all Environmental Factors Except "Reusability"

Adjustment Factor Value	System Influence	% Affects or Required by the Application
0	None	0%
1	Minor (insignificant)	1–20%
2	Moderate	21–40%
3	Average	41–60%
4	Significant	61–80%
5	Strong Throughout	81–100%

Use for "Reusability"

Adjustment Factor Value	System Influence	% Affects or Required by the Application
0	None	0%
1	Minor (insignificant)	1–20%
2	Moderate	21–30%
3	Average	31–40%
4	Significant	41–50%
5	Strong Throughout	> 50%

Adjusted Function Points

4. Calculate Complexity Adjustment Factor (CAF)

- Total Degree of Influence (N) = ΣF_i (Sum of the 14 environmental factor values)
- Complexity Adjustment Factor (CAF) = 0.65 + (.01 x N)

5. Compute Adjusted Function Points (FP)

- $FP_{adjusted} = FP_{unadjusted}$ x CAF

6. Convert to Lines of Code (LOC) if needed

Lines of Code to Function Point Translation Table

Language	Level	Avg LOC/ AFP
Basic Assembler	1	320
Macro Assembler	1.5	213
C	2.5	128
ALGOL	3	105
COBOL	3	105
FORTRAN	3	105
JOVIAL	3	105
Mixed Languages (default)	3	105
Other Languages (default)	3	105
Pascal	3.5	91
RPG	4	80
MODULA-2	4.5	80
PL/1	4.5	80
Ada	4.5	71
BASIC	5	64

Language	Level	Avg LOC/ AFP
FORTH	5	64
LISP	5	64
PROLOG	5	64
LOGO	5.5	58
English-based languages	6	53
Data-based languages	8	40
Decision support languages	9	35
APL	10	32
Statistical languages	10	32
OBJECTIVE-C	12	27
SMALLTALK	15	21
Menu-driven generators	20	16
Database query languages	25	13
Spreadsheet languages	50	6
Graphic Icon languages	75	4

Note: The LOC/AFP values provided in the table may vary based on the factors of the development environment and the specific version of the programming language used. The estimator should use the numbers with caution based on experience. *Function Point Analysis*, Brian J. Dreger