

G53QAT

The Function Point Method

- Devised in 1979 by A. J. Albrecht, then of IBM, as a means of measuring software size and *productivity*.
- In practice this metric is used to measure the amount of functionality in a system as described by a specification.
- Quantifies the size and complexity of an application based on its inputs, outputs, inquiries, internal files, and interfaces.

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Computing Function Points

The function point estimation process:

- Stage 1:** Compute the unadjusted (crude) function count (points) (**UFC / CFP**).
- Stage 2:** Compute the relative complexity adjustment factor (**RCAF**) for the project. RCAF varies between 0 and 70.
- Stage 3:** Compute the number of function points (**FP**):

$$FP = CFP \times (0.65 + 0.01 \times RCAF)$$

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Calculating Crude Function Points

- Relates to the following five software components:
 - Number of user inputs
 - Number of user outputs
 - Number of user online queries
 - Number of logical files
 - Number of external interface
- Weighted factors are applied to each components according to their complexity.

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CFP Calculation Form

Software system components	Complexity level									Total CFP
	Simple			average			complex			
	Count	Weight Factor	Points	Count	Weight Factor	Points	Count	Weight Factor	Points	
	A	B	C = AxB	D	E	F = Dx E	G	H	I = GxH	
User inputs		3			4			6		
User outputs		4			5			7		
User online queries		3			4			6		
Logical files		7			10			15		
External interfaces		5			7			10		
Total CFP										

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Relative Complexity Adjustment Factor (RCAF)

- Summarizes the complexity characteristics of the software system
 - assign grades (0 to 5) to the 14 subjects that substantially affect the development effort:

$$RCAF = \sum_{i=1}^{14} S_i$$

- The RCAF determines the *technical complexity factor* (TCF): $TCF = 0.65 + 0.01 * RCAF$

- FP = CFP * TCF

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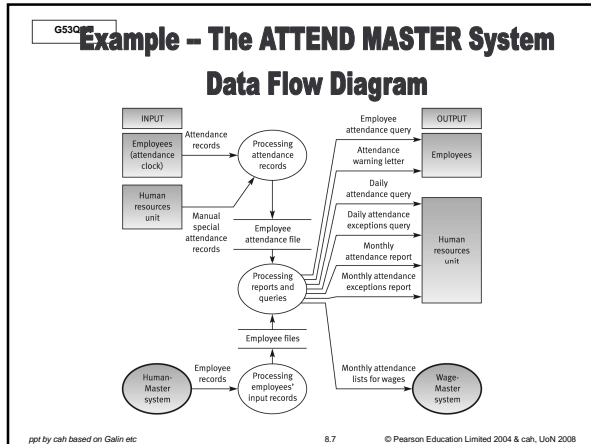
Relative complexity adjustment factor (RCAF) – form

No	Subject	Grade
1	Requirement for reliable backup and recovery	0 1 2 3 4 5
2	Requirement for data communication	0 1 2 3 4 5
3	Extent of distributed processing	0 1 2 3 4 5
4	Performance requirements	0 1 2 3 4 5
5	Expected operational environment	0 1 2 3 4 5
6	Extent of online data entries	0 1 2 3 4 5
7	Extent of multi-screen or multi-operation online data input	0 1 2 3 4 5
8	Extent of online updating of master files	0 1 2 3 4 5
9	Extent of complex inputs, outputs, online queries and files	0 1 2 3 4 5
10	Extent of complex data processing	0 1 2 3 4 5
11	Extent that currently developed code can be designed for reuse	0 1 2 3 4 5
12	Extent of conversion and installation included in the design	0 1 2 3 4 5
13	Extent of multiple installations in an organization and variety of customer organizations	0 1 2 3 4 5
14	Extent of change and focus on ease of use	0 1 2 3 4 5
	Total = RCAF	

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The ATTEND MASTER CFP calculation form

Software system components	Complexity level									Total CFP
	Simple			average			complex			
	Count	Weight Factor	Points	Count	Weight Factor	Points	Count	Weight Factor	Points	
	A	B	C= Ax+B	D	E	F= Dx+E	G	H	I= GxH	
User inputs	1	3	3	---	4	---	1	6	6	9
User outputs	---	4	---	2	5	10	1	7	7	17
User online queries	1	3	3	1	4	4	1	6	6	13
Logical files	1	7	7	---	10	---	1	15	15	22
External interfaces	---	5	---	---	7	---	2	10	20	20
Total CFP										81

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The ATTEND MASTER RCAF calculation form

No	Subject	Grade
1	Requirement for reliable backup and recovery	0 1 2 3 4 5
2	Requirement for data communication	0 1 2 3 4 5
3	Extent of distributed processing	0 1 2 3 4 5
4	Performance requirements	0 1 2 3 4 5
5	Expected operational environment	0 1 2 3 4 5
6	Extent of online data entries	0 1 2 3 4 5
7	Extent of multi-screen or multi-operation online data input	0 1 2 3 4 5
8	Extent of online updating of master files	0 1 2 3 4 5
9	Extent of complex inputs, outputs, online queries and files	0 1 2 3 4 5
10	Extent of complex data processing	0 1 2 3 4 5
11	Extent that currently developed code can be designed for reuse	0 1 2 3 4 5
12	Extent of conversion and installation included in the design	0 1 2 3 4 5
13	Extent of multiple installations in an organization and variety of customer organizations	0 1 2 3 4 5
14	Extent of change and focus on ease of use	0 1 2 3 4 5
	Total = RCAF	41

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The ATTEND MASTER – function points calculation

$FP = CFP \times (0.65 + 0.01 \times RCAF)$

$FP = 81 \times (0.65 + 0.01 \times 41) = 85.86$

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Advantages and Disadvantages

Main advantages

- Estimates can be prepared at the pre-project stage.
- Based on requirement specification documents (not specific dependent on development tools or programming languages), the method's reliability is relatively high.

Main disadvantages

- FP results depend on the counting instruction manual.
- Estimates based on detailed requirements specifications, which are not always available.
- The entire process requires an experienced function point team and substantial resources.
- The evaluations required result in subjective results.
- Successful applications are related to data processing. The method cannot yet be universally applied.

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