Function Point Counting Weights

Type	Low	Avg	High	Total
EI	___x 3 + __ x 4	+ __ x 6 =	__	
EO	___x 4 + __ x 5	+ __ x 7 =	__	
EQ	___x 3 + __ x 4	+ __x 6 =	__	
ILF	___ x 7 + __ x10	+ _ x 15=	__	
EIF	___x 5 + __ x 7	+ _ x10 =	__	

ILF and EIF Complexity Matrix

RETs	1-19 DETs	20-50 DETs	51+ DETs
1	Low	Low	Avg
2-5	Low	Avg	High
6+	Avg	High	High

EI Complexity Matrix

FTRs	1-4 DETs	5-15 DETs	16+ DETs
0-1	Low	Low	Avg
2	Low	Avg	High
3+	Avg	High	High

EO and EQ* Complexity Matrix

FTRs	1-5 DETs	6-19 DETs	20+ DETs
0-1	Low	Low	Avg
2-3	Low	Avg	High
4+	Avg	High	High

* an EQ must have at least 1 FTR

FORMULAS

1. New Development = (UFP + CFP) * VAF
2. Application Count = ADD * VAF
3. Enhancement = [(ADD + CHGA + CFP) * VAFA] + (DEL * VAFB)
4. Revised Application = [(UFPB + ADD + CHGA) - (CHGB + Del)]* VAFA
5. VAF = (Σ (DI) * .01) + .65

Where:

ADD = added functionality
CFP = conversion functionality
CHGA = UFP of changed functionality after enhancement
CHGB = UFP of changed functionality before enhancement
DEL = deleted functionality
DI = degree of influence of GSCs
UFP = unadjusted function point count
UFPB = application UFP before project
VAF = Value Adjustment Factor
VAFA = VAF after enhancement
VAFB = VAF before enhancement

ILF/EILF DET counting rules:
Count a DET for each unique user recognizable, non-repeated field maintained in or retrieved from the ILF or EIF through the execution of an elementary process. When two applications maintain and/or reference the same ILF/EIF, but each maintains or references separate DETs, count only the DETs being used by each application to size the ILF/EIF. Count a DET for each piece of data required by the user to establish a relationship with another ILF or EIF.

EI DET counting rules:
Count one DET for each user recognizable, non-repeated field that enters or exists the application boundary and is required to complete the external input; if a DET both enters and exits the boundary, count it only once for the elementary process.

EI/EO/EQ DET counting rules:
Count one DET for the capability to send a system response message outside the application boundary to indicate an error occurred during processing, confirm that processing is complete or verify that processing should continue. Count one DET for the ability to specify an action to be taken even if there are multiple methods for invoking the same logical process. Do not count fields that are retrieved or derived by the system and stored on an ILF during the elementary process if the fields did not cross the application boundary. Do not count literals, paging variables or system-generated stamps.

EO/EQ DET counting rules:
Count one DET for each user recognizable, non-repeated field that enters the application boundary and is required to specify when what and/or how the data is to be retrieved or generated by the elementary process. Count one DET for each user recognizable, non-repeated field that exits the boundary; if a DET both enters and exits the boundary, count it only once for the elementary process.

For more information contact:
David Consulting Group
www.davidconsultinggroup.com

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Achieving Software Excellence

4.2 CPM Function Point Counting Guidelines

KEY DEFINITION OF TERMS

User - Any person that specifies Functional User Requirements and/or any person or thing that communicates or interacts with the software at any time.
User View – represents a formal description of the user's business needs in the user's language. Developers translate the user information into information technology language in order to provide a solution.
User Identifiable – defined requirements for processes and/or groups of data that are agreed upon, and understood by, both the users and the developers.
Counting Scope – defines a (sub) set of the software being sized; is determined by the purpose of the count; identifies which functions will be included in the function point count; could include one or more than one application.
Control information – is data that influences an elementary process of the application. It specifies what, when or how data is to be processed.
Elementary Process - The smallest unit of activity that is meaningful to the user(s). The activity must be self-contained and leave the business of the application being counted in a consistent state

INTERNAL LOGICAL FILE (ILF):
Primary intent to hold logically related data or control information maintained through one or more elementary processes of the application being counted.

* Group of data or control information is logical and user identifiable
* Group of data is maintained through one or more elementary processes within the application boundary

EXTERNAL INTERFACE FILE (EIF):
Primary intent to hold logically related data or control information referenced through one or more elementary processes within the boundary of the application counted. An EIF counted for an application must be an ILF in another application, but is not maintained within the application being counted.

* Group of data or control information is logical and user identifiable
* Group of data is referenced by, and external to, the application being

counted
* Group of data is not maintained by the application being counted
* Group of data is maintained in an ILF of another application

EXTERNAL INPUT (EI):
Primary intent of an elementary process to maintain an ILF or alter the behavior of the system.
* Data or control information is received from outside the application boundary
* At least one ILF is maintained, if data is not control information that alters the behavior of the system
* For the identified process, one of the following must apply:
  - Processing logic is unique
  - The set of data elements identified is different from the sets identified for other EIs
  - The ILFs or EIFs referenced are different from other EIs

EXTERNAL OUTPUT (EO):
Sends data or control information external to the application's boundary. Primary intent of an elementary process to present information to a user through processing logic other than or in addition to retrieval of data or control information.
* For the identified process one of the following must apply:
  - Processing logic is unique
  - The set of data elements different from other EOs
  - The ILFs or EIFs referenced are different from other EOs
* In addition, one of the following must apply; the processing logic of the elementary process:
  - Contains at least one mathematical formula or calculation
  - Creates derived data
  - Maintains at least one ILF
  - Alters the behavior of the system

EXTERNAL INQUIRY (EQ):
Sends data or control information external to the application's boundary. Primary intent of an elementary process to present information to a user through retrieval of data or control information from an ILF or EIF.
* For the identified process one of the following must apply:
  - Processing logic is unique
  - The set of data elements identified are different from other EQs
  - The ILFs or EIFs referenced are different from other EQs
* In addition, all of the following must apply; the processing logic of the elementary process:
  - Retrieves data or control information from an ILF/EIF
  - Does **not** contain a mathematical formula or calculation
  - Does **not** create derived data
  - Does **not** alter the behavior of the system
  - Does **not** maintain an ILF

GENERAL SYSTEM CHARACTERISTICS
If none of the guideline descriptions fit the application exactly, a judgment must be made about which Degree of Influence most closely applies to the application. These questions are answered using Degrees of Influence (DI) on a scale of zero to five.

0 Not present, or no influence
1 Incidental influence
2 Moderate influence
3 Average influence
4 Significant influence
5 Strong influence throughout

1. **DATA COMMUNICATIONS**
2. **DISTRIBUTED DATA PROCESSING**
3. **PERFORMANCE**
4. **HEAVILY USED CONFIGURATION**
5. **TRANSACTION RATE**
6. **ON-LINE DATA ENTRY**
7. **END-USER EFFICIENCY**
8. **ON-LINE UPDATE**
9. **COMPLEX PROCESSING**
10. **REUSABILITY**
11. **INSTALLATION EASE**
12. **OPERATIONAL EASE**
13. **MULTIPLE SITES**
14. **FACILITATE CHANGE**

SUMMARY OF FUNCTIONS PERFORMED

	EI	EO	EQ
Alter the behavior of the system	PI	F	N/A
Maintain one or more ILFs	PI	F	N/A
Present information to a user	F	PI	PI

PI The primary intent of the transactional function type
F A function of the transactional function type, but not the primary intent and sometimes present
N/A The function is not allowed by the transactional function type

SUMMARY OF PROCESSING LOGIC USED BY EIs, EOs and EQs

Form of Processing Logic	EI	EO	EQ
Validations are performed	c	c	c
Mathematical formula or calculations are performed	c	m*	n
Equivalent values are converted	c	c	c
Data is filtered and selected using specified criteria to compare multiple sets of data	c	c	c
Conditions are analyzed to determine which are applicable	c	c	c
At least one ILF is updated	m*	m*	n
At least one ILF or EIF is referenced	c	c	m
Data or control information is retrieved	c	c	m
Derived data is created	c	m*	n
Behavior of the system is altered	m*	m*	n
Prepare and present information outside the boundary	c	m	m
Capability to accept data or control information that enters the application boundary	m	c	c
Resorting or rearranging a set of data	c	c	c

LEGEND:
m it is **mandatory** that the function type perform the form of processing logic
m* it is **mandatory** that the function type perform at least one of these (m*) forms of processing logic
c the function **can** perform the form of processing logic, but it is not mandatory
n function **cannot** perform the form of processing logic