EXTERNAL INPUT (EI)

An elementary process that processes data or control information that comes from outside the boundary. The primary intent of an EI is to maintain one or more ILFs and/or to alter the behaviour of the system. Rules: All of the following must apply

• The data or control information is received from outside the application boundary. At least one ILF is maintained if the data entering the boundary is not control information that alters the behaviour of the system.

• For the identified EP, one of the three statements must apply:
  • Processing logic is unique from processing logic performed by other EIs for the application.
  • The set of data elements identified is different from the sets identified for other EIs in the application.
  • The ILFs or EIFs referenced are different from the files referenced by the other EIs in the application.

The number of FTRs and DETs determines EI COMPLEXITY

FTR RULES FOR EI

• Count a FTR for each ILF maintained.
• Count a FTR for each ILF or EIF read during the processing of the EI.
• Count only one FTR for each ILF that is both maintained and read.

EI DET RULES FOR EI

• Count one DET for each unique user recognizable, non-repeated attribute that crosses (enters or exits) the boundary during the processing of the transactional function.
• Count only one DET per transactional function for the ability to send an application response message even if there are multiple messages.
• Count one DET for the ability to initiate action(s) even if there are multiple means to do so.
• Do not count attributes that are generated and saved, retrieved or referenced if they do not cross the boundary.
• Do not count literals, paging variables, navigation aids or system-generated stamps.

EXTERNAL OUTPUTS (EO)

An elementary process that sends data or control information sent outside the application’s boundary and includes additional processing beyond that of an external inquiry. The primary intent of an external output is to present information to a user through processing logic other than calculation. The processing logic contains no mathematical formula or calculation, and creates no derived data. No ILF is maintained during the processing, nor is the behaviour of the system altered.

Rules – All of the following must apply

• Sends data or control information external to the application’s boundary.
• For the identified EP, one of the three statements must apply:
  • Processing logic is unique from processing logic performed by other EOs for the application.
  • The set of data elements identified is different from the sets identified for other EOs in the application.
  • The ILFs or EIFs referenced are different from the files referenced by the other EOs in the application.

The group of data or control information is logical and user defined.

The group of data is referenced by, and external to, the application being counted.

The group of data is not maintained by the application being counted.

The group of data is maintained in an ILF of another application.

ILF / EIF Complexity is determined by the number of RETs and DETs.

DET RULES for ILF/EIF

• Count a DET for each unique user recognizable, non-repeated attribute that crosses (enters or exits) the boundary during the processing of the transactional function.
• Count only one DET for each ILF that is both maintained and read by the elementary process.
• Count only one DET for the ability to initiate action(s) even if there are multiple means to do so.
• Do not count attributes that are generated and saved, retrieved or referenced if they do not cross the boundary.
• Do not count literals, paging variables, navigation aids or system-generated stamps.

Additional FTR Rule for EO

• Count a FTR for each ILF or EIF read during the processing of the elementary process.

ADDITIONAL FTR RULE FOR EO

• Count a FTR for each ILF maintained during the processing of the elementary process.
• Count only one FTR for each ILF that is both maintained and read by the elementary process.

DET RULES for EO/EQ

• Count one DET for each unique user recognizable, non-repeated attribute that crosses (enters or exits) the boundary during the processing of the transactional function.
• Count only one DET per transactional function for the ability to send an application response message even if there are multiple messages.
• Count one DET for the ability to initiate action(s) even if there are multiple means to do so.
• Do not count attributes that are generated and saved, retrieved or referenced if they do not cross the boundary.
• Do not count literals, paging variables, navigation aids or system-generated stamps.

In addition, one of the following rules must apply:

• The processing logic contains at least one mathematical formula or calculation.
• The processing logic maintains at least one ILF.
• The processing logic alters the behaviour of the system.

EXTERNAL INQUIRY (EQ)

An elementary process that sends data or control information outside the boundary. The primary intent of an external inquiry is to present information to the user through the retrieval of data or control information. The processing logic contains no mathematical formula or calculation, and creates no derived data. No ILF is maintained during the processing, nor is the behaviour of the system altered.

Rules – All of the following must apply:

• Sends data or control information external to the application’s boundary.
• For the identified EP, one of the three statements must apply:
  • Processing logic is unique from processing logic performed by other EOs for the application.
  • The set of data elements identified is different from the sets identified for other EOs in the application.
  • The ILFs or EIFs referenced are different from the files referenced by the other EOs in the application.

The group of data or control information is logical and user defined.

The group of data is referenced by, and external to, the application being counted.

The group of data is not maintained by the application being counted.

The group of data is maintained in an ILF of another application.

ILF / EIF Complexity is determined by the number of RETs and DETs.

FTR RULES FOR EO/EQ

• Count a FTR for each ILF or EIF read during the processing of the elementary process.

ADDITIONAL FTR RULE FOR EO

• Count a FTR for each ILF maintained during the processing of the elementary process.
• Count only one FTR for each ILF that is both maintained and read by the elementary process.

DET RULES for EO/EQ

• Count one DET for each unique user recognizable, non-repeated attribute that crosses (enters or exits) the boundary during the processing of the transactional function.
• Count only one DET per transactional function for the ability to send an application response message even if there are multiple messages.
• Count one DET for the ability to initiate action(s) even if there are multiple means to do so.
• Do not count attributes that are generated and saved, retrieved or referenced if they do not cross the boundary.
• Do not count literals, paging variables, navigation aids or system-generated stamps.

In addition, one of the following rules must apply:

• The processing logic contains at least one mathematical formula or calculation.
• The processing logic maintains at least one ILF.
• The processing logic alters the behaviour of the system.

INTERNAL LOGICAL FILE (ILF)

User recognisable group of logically related data or control information maintained within the boundary of the application being measured. The primary intent of an ILF is to hold data maintained through one or more elementary processes of the application being counted.

Rules – All of the following must apply:

• The group of data or control information is logical and user defined.
• The group of data is maintained through an elementary process within the application boundary being counted.

EXTERNAL INTERFACE FILE (EIF)

User recognisable group of logically related data or control information which is referenced by the application being measured, but maintained within the boundary of another application. The primary intent of an EIF is to hold data referenced through one or more elementary processes within the boundary of the application counted. This means an EIF counted for an application must be an ILF in another application.

Rules – All of the following must apply:

• The group of data or control information is logical and user defined.
• The group of data is referenced by, and external to, the application being counted.
• The group of data is not maintained by the application being counted.
• The group of data is maintained in an ILF of another application.

ILF / EIF Complexity is determined by the number of RETs and DETs.
FUNCTION POINTS AWARDED

<table>
<thead>
<tr>
<th></th>
<th>Low</th>
<th>Average</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>EI</td>
<td>3</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>EO</td>
<td>4</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>EQ</td>
<td>3</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>ILF</td>
<td>7</td>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>EIF</td>
<td>5</td>
<td>7</td>
<td>10</td>
</tr>
</tbody>
</table>

EQUATIONS

New Development FP Count
DFP = ADD + CFP

DFP = development project function point count
ADD = size of functions delivered to the user by the development project
CFP = size of the conversion functionality

Application FP Count
AFP = ADD

AFP = application function point count
ADD = size of functions delivered to the user by the development project (excluding the size of any conversion functionality), or the functionality that exists whenever the application is counted

Enhancement FP Count
EFP = ADD + CHGA + CFP + DEL

EFP = enhancement function point count
ADD = size of functions being added by the enhancement project
CHGA = size of functions being changed by the enhancement project
CFP = size of the conversion functionality
DEL = size of functions being deleted by the enhancement project

Revised Application FP Count
AFPA = (AFPB + ADD + CHGA) – (CHGB + DEL)

AFPA = application function point count after the enhancement project
AFPB = application function point count before the enhancement project
ADD = size of functions delivered to the user by the development project
CHGA = size of functions being changed by the enhancement project
CHGB = size of functions being changed by the enhancement project – as they are/were before the project commenced
CHGB = size of functions being changed by the enhancement project – as they are/were after the project commenced
DEL = size of functions being deleted by the enhancement project

EQUATIONS

EFP = enhancement function point count
ADD = size of functions delivered to the user by the development project
CHGA = size of functions being changed by the enhancement project
CFP = size of the conversion functionality
DEL = size of functions being deleted by the enhancement project
CHGB = size of functions being changed by the enhancement project – as they are/will be after implementation

Primary Intent of EIs, EOs and EQs

<table>
<thead>
<tr>
<th>Function</th>
<th>EI</th>
<th>EO</th>
<th>EQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alter the behaviour of the system</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Maintain one or more ILFs</td>
<td>F</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Present information to the user</td>
<td>F</td>
<td>PI</td>
<td>PI</td>
</tr>
</tbody>
</table>

Processing Logic Used by EIs, EOs and EQs

<table>
<thead>
<tr>
<th>Form of Processing Logic</th>
<th>EI</th>
<th>EO</th>
<th>EQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Validation is performed</td>
<td>c</td>
<td>c</td>
<td>c</td>
</tr>
<tr>
<td>Mathematical calculations are performed</td>
<td>c</td>
<td>m*</td>
<td>n</td>
</tr>
<tr>
<td>Equivalent values are converted</td>
<td>c</td>
<td>c</td>
<td>c</td>
</tr>
<tr>
<td>Data is filtered and selected using specified criteria to compare multiple sets of data</td>
<td>c</td>
<td>c</td>
<td>c</td>
</tr>
<tr>
<td>Conditions are analyzed to determine which are applicable</td>
<td>c</td>
<td>c</td>
<td>c</td>
</tr>
<tr>
<td>At least one ILF is updated</td>
<td>m*</td>
<td>m*</td>
<td>n</td>
</tr>
<tr>
<td>At least one ILF or EIF is referenced</td>
<td>c</td>
<td>c</td>
<td>m</td>
</tr>
<tr>
<td>Data or control information is retrieved</td>
<td>c</td>
<td>c</td>
<td>n</td>
</tr>
<tr>
<td>Derived data is created</td>
<td>c</td>
<td>m*</td>
<td>n</td>
</tr>
<tr>
<td>Behaviour of the application is altered</td>
<td>m*</td>
<td>m*</td>
<td>n</td>
</tr>
<tr>
<td>Information is prepared and then presented outside the boundary</td>
<td>c</td>
<td>m</td>
<td>m</td>
</tr>
<tr>
<td>Data or control information entering the application is accepted</td>
<td>m</td>
<td>c</td>
<td>c</td>
</tr>
<tr>
<td>A set of data is sorted or arranged</td>
<td>c</td>
<td>c</td>
<td>c</td>
</tr>
</tbody>
</table>

Legend:

- m = Mandatory: that the function type perform the form of processing logic
- m* = Mandatory: that the function type perform at least one of these (m*) forms of processing logic
- c = Can perform the form of processing logic but is not mandatory
- n = Cannot perform the form of processing logic

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