On the compatibility between Full Function Points and IFPUG Function Points

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Agenda...

- Context
- A common framework for comparison
- Comparing the software models
- Comparing the measurement processes
- Conclusion
FFP (v. 1.0) was published in 1997 as an extension of IFPUG method to measure the functional size of real-time software.

FFP adds “extension points” to IFPUG points to obtain functional size.

Question: are FFP “extension points” and IFPUG “points” compatible?

Compatibility analyzed between version 1.0 of FFP and version 4.0 of IFPUG.
Context...

- **Method used to analyze compatibility:**
  
  - Build a common framework for comparison,
  
  - Analyze the compatibility through each component of the framework,
  
  - If all components are compatible, the two methods will be deemed compatible.
A common framework for comparison...

Software to be measured → MAPPING Process → Software model → MEASUREMENT Process → Functional size

- Concepts, definitions, rules & procedures
- Counting Practices Manuals
- Measurement methods
Comparing the software models...

- Boundary
- Users
- Data objects
- Process objects
- Sub-process objects
Comparing the software models...

<table>
<thead>
<tr>
<th><strong>BOUNDARY</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FFP (v. 1.0)</strong></td>
<td><strong>IFPUG (v. 4.0)</strong></td>
</tr>
<tr>
<td>Identical to IFPUG(^{(2)})</td>
<td>“The border between the application or project being measured and the external applications or the user domain. A boundary establishes what functions are included in the function point count.” (^{(1)})</td>
</tr>
</tbody>
</table>


Comparing the software models...

- **USERS**

<table>
<thead>
<tr>
<th>FFP (v. 1.0)</th>
<th>IFPUG (v. 4.0)</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Human beings, applications or mechanical devices which interact with the measured application.” (2)</td>
<td>” [1] The person or organization that uses the measured application. Included would be the requirement author, end users, management users, auditors, and operations. [2] The human being who uses the application” (1)</td>
</tr>
</tbody>
</table>


Comparing the software models...

**DATA OBJECTS**

<table>
<thead>
<tr>
<th></th>
<th>FFP (v. 1.0)</th>
<th>IFPUG (v. 4.0)</th>
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<tbody>
<tr>
<td><strong>Group of data</strong></td>
<td>data identified and grouped together based on the functional perspective.</td>
<td>”Data function types: the functionality provided to the user to meet internal and external data requirements. Data function types are either internal logical files (ILFs) or external interface files (EIFs).”</td>
</tr>
<tr>
<td><strong>Control data</strong></td>
<td>data used by the application to control, directly or indirectly, the behavior of an application or a mechanical device.</td>
<td></td>
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Comparing the software models...

<table>
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<th>PROCESS OBJECTS</th>
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<tr>
<td><strong>FFP (v. 1.0)</strong></td>
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<tr>
<td>“Control process: process that controls, directly or</td>
<td>” Elementary process:</td>
</tr>
<tr>
<td>indirectly, the behavior of an application or a</td>
<td>the smallest unit of</td>
</tr>
<tr>
<td>mechanical device.”</td>
<td>activity that is</td>
</tr>
<tr>
<td>“Process: A set of operations or activities which</td>
<td>meaningful to the end</td>
</tr>
<tr>
<td>acts on inputs to produce a result.” (2)</td>
<td>user in the business.</td>
</tr>
<tr>
<td></td>
<td>It must be self-</td>
</tr>
<tr>
<td></td>
<td>contained and leave</td>
</tr>
<tr>
<td></td>
<td>the business</td>
</tr>
<tr>
<td></td>
<td>of the application</td>
</tr>
<tr>
<td></td>
<td>being counted</td>
</tr>
<tr>
<td></td>
<td>in a consistent state.” (1)</td>
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Comparing the software models...

- **SUB-PROCESS OBJECTS**

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<td>&quot;Sub-process: [...] the smallest processing step identifiable from a functional perspective as either an entry, exit, read or write.&quot; (2)</td>
<td>No equivalent</td>
</tr>
</tbody>
</table>


Comparing the software models...

SUMMARY

- **Boundary**: Identical
- **Users**: FFP definition is a superset of IFPUG
- **Data objects**: FFP definition is a superset of IFPUG
- **Process objects**: FFP definition is a superset of IFPUG
- **Sub-process objects**: one level of granularity below process objects

Compatible since it can be aggregated at the process objects level
Comparing the measurement processes...

- Compatibility of the measured objects
- Compatibility of the measurement functions
- Compatibility of the aggregation functions
Comparing the measurement processes...

- MEASURED OBJECTS

  - Data objects: compatible

  - Process objects: compatible since FFP sub-process can be aggregated at the “process object” level.
Comparing the measurement processes...

### MEASUREMENT FUNCTIONS

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<td>EIF &amp; ILF</td>
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<td>Extension of IFPUG</td>
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<td><strong>Process objects</strong></td>
<td>ECE, ECX, ICR, ICW</td>
<td>EI, EO, EQ</td>
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Comparing the measurement processes...

MEASUREMENT FUNCTIONS

“An external input (EI) processes data or control information that comes from outside the application's boundary...

(A)

The processed data maintains one or more ILFs”

(B)

[1, section 6, p.4].

Comparing the measurement processes...

### MEASUREMENT FUNCTIONS

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Compatible
Comparing the measurement processes...

- AGGREGATION FUNCTIONS

Both FFP\textsuperscript{v1.0} and IFPUG\textsuperscript{v4.0} aggregate measurement results by arithmetically adding the functional size of measured objects.

Compatible
Comparing the measurement processes...

SUMMARY

- Measured objects: compatible at the process object level
- Measurement functions: compatible within IFPUG ranges
- Aggregation functions: compatible
Conclusion...

- FFP v 1.0 and IFPUG v. 4.0:

  Are entirely compatible at the data and process object level; within the range of IFPUG measurement functions values.
Conclusion...

- **FFP v 1.0 and IFPUG v. 4.0:**

  Are entirely compatible at the data and process object level, outside the range of IFPUG measurement functions values under the following conditions:

A) FFP measurement functions for single occurrence data provide appropriate extrapolation of IFPUG data measurement functions

B) FFP sub-process measurement function combined with FFP aggregation function provide appropriate extrapolation of IFPUG process measurement function
Conclusion...

- Conditions for compatibility are deemed reasonable for most purposes,

- Practice feedback: both methods offer similar results on MIS software; FFP offers more adequate results on real-time software.
Acknowledgment...

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