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

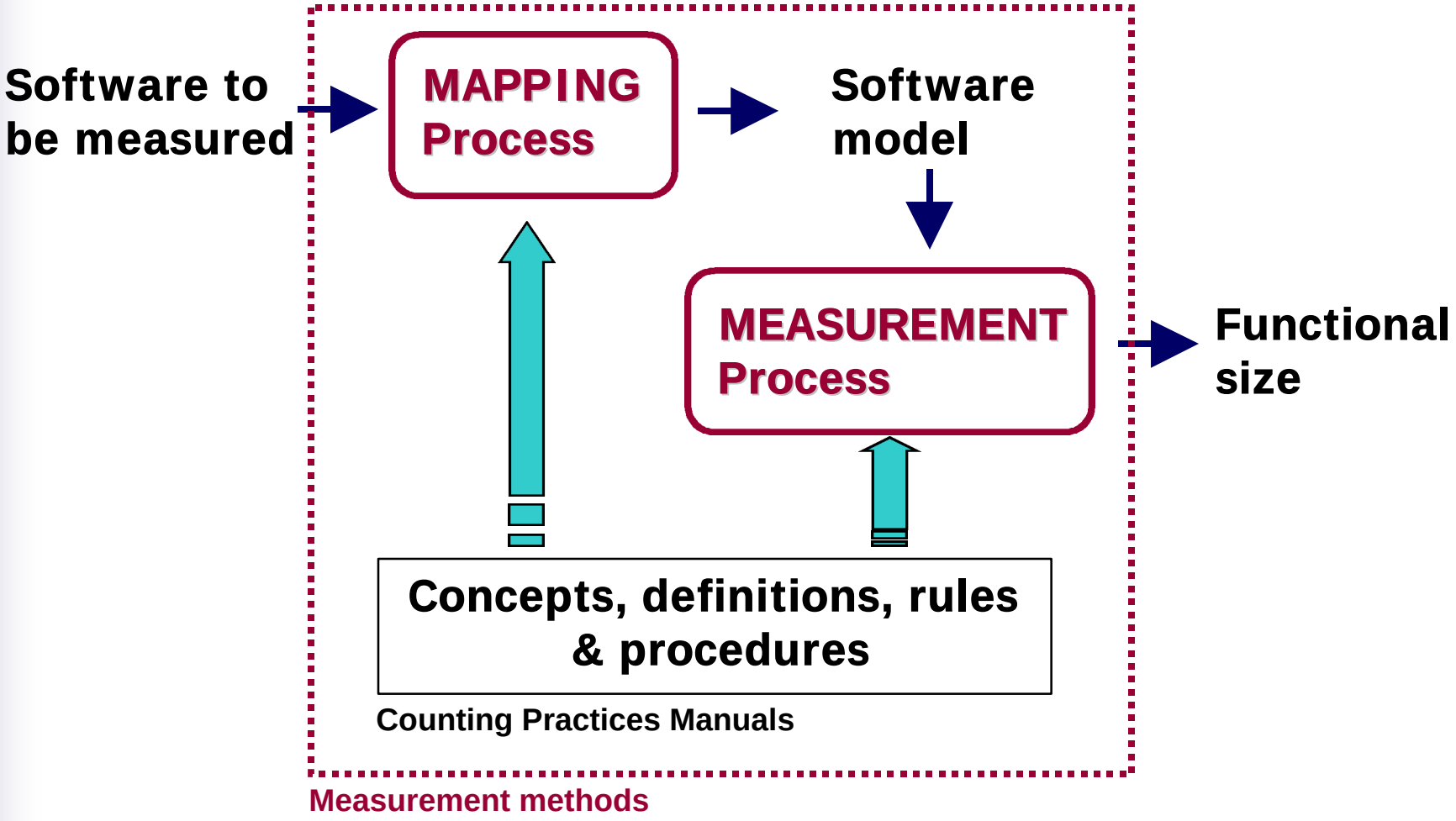
Context...

- 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...



Comparing the software models...

- Boundary
- Users
- Data objects
- Process objects
- Sub-process objects

Comparing the software models...

⊙ BOUNDARY

FFP (v. 1.0)	IFPUG (v. 4.0)
Identical to IFPUG(2)	"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)

(1): "*Function Points Counting Practices Manual – Release 4.0*", International Function Point Users Group (IFPUG), Westerville, Ohio, USA, January 1994.
(2): "*Full Function Points: Counting Practices Manual*", Software Engineering Management Research Laboratory, Université du Québec à Montréal, Technical Report no. 1997-04, September 1997. See www.lrgl.uqam.ca/ffp.html

Comparing the software models...

- **USERS**

FFP (v. 1.0)	IFPUG (v. 4.0)
"Human beings, applications or mechanical devices which interact with the measured application." (2)	" [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)

(1): "*Function Points Counting Practices Manual – Release 4.0*", International Function Point Users Group (IFPUG), Westerville, Ohio, USA, January 1994.
(2): "*Full Function Points: Counting Practices Manual*", Software Engineering Management Research Laboratory, Université du Québec à Montréal, Technical Report no. 1997-04, September 1997. See www.lrgl.uqam.ca/ffp.html

Comparing the software models...

⊙ DATA OBJECTS

FFP (v. 1.0)	IFPUG (v. 4.0)
"**Group of data**: data identified and grouped together based on the functional perspective." "**Control data**: data used by the application to control, directly or indirectly, the behavior of an application or a mechanical device." (2)	" **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)." (1)

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Comparing the software models...

⊙ PROCESS OBJECTS

FFP (v. 1.0)	IFPUG (v. 4.0)
"**Control process**: process that controls, directly or indirectly, the behavior of an application or a mechanical device." "**Process**: A set of operations or activities which acts on inputs to produce a result." (2)	" **Elementary process**: the smallest unit of activity that is meaningful to the end user in the business. It must be self-contained and leave the business of the application being counted in a consistent state." (1)

(1): "*Function Points Counting Practices Manual – Release 4.0*", International Function Point Users Group (IFPUG), Westerville, Ohio, USA, January 1994.
(2): "*Full Function Points: Counting Practices Manual*", Software Engineering Management Research Laboratory, Université du Québec à Montréal, Technical Report no. 1997-04, September 1997. See www.lrgl.uqam.ca/ffp.html

Comparing the software models...

⊙ SUB-PROCESS OBJECTS

FFP (v. 1.0)	IFPUG (v. 4.0)
"**Sub-process**: […] the smallest processing step identifiable from a functional perspective as either an entry, exit, read or write." (2)	**No equivalent**

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(2): "*Full Function Points: Counting Practices Manual*", Software Engineering Management Research Laboratory, Université du Québec à Montréal, Technical Report no. 1997-04, September 1997. See www.lrgl.uqam.ca/ffp.html

Comparing the software models...

SUMMARY

- **Boundary**: Identical — Compatible
- **Users**: FFP definition is a superset of IFPUG — Compatible
- **Data objects**: FFP definition is a superset of IFPUG — Compatible
- **Process objects**: FFP definition is a superset of IFPUG — Compatible
- **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

		FFP v 1.0	IFPUG v 4.0
Data objects	Mult. Occ.	RCG & UCG	EIF & ILF
	Single Occ.	RCG & UCG	
Process objects		ECE, ECX, ICR, ICW	EI, EO, EQ

Compatible

Extension of IFPUG

???

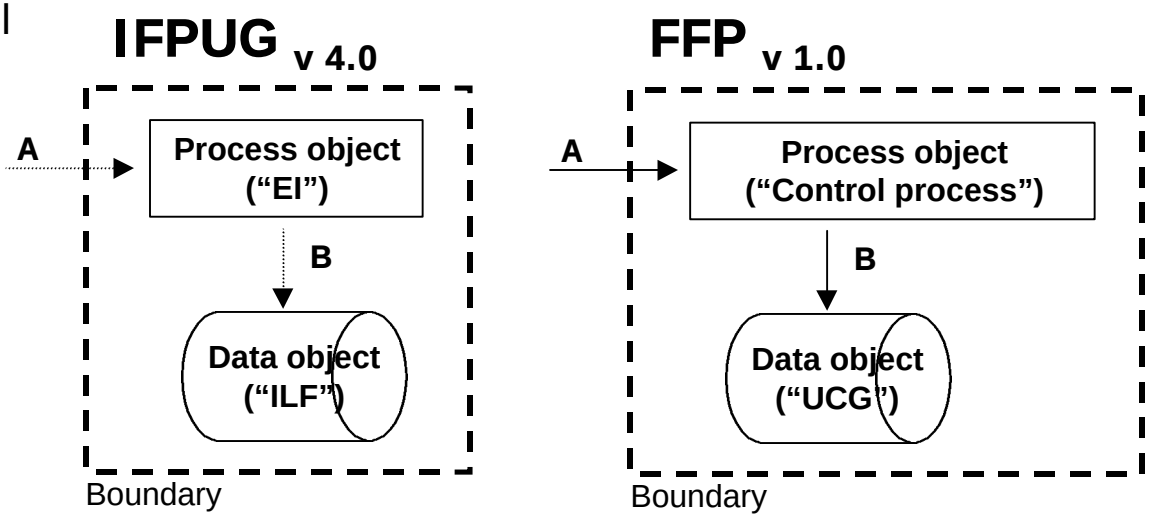
Comparing the measurement processes…

⊙ 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].



(1): "*Function Points Counting Practices Manual – Release 4.0*", International Function Point Users Group (IFPUG), Westerville, Ohio, USA, January 1994.

Comparing the measurement processes...

- **MEASUREMENT FUNCTIONS**

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Compatible

Extension of IFPUG

Compatible

Comparing the measurement processes...

- **AGGREGATION FUNCTIONS**

Both FFP $_{v\ 1.0}$ and IFPUG $_{v\ 4.0}$ 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.

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