Proposals for increasing benchmarking data quality of projects measured in COSMIC

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Friday May 30, Milan, Italy
Outline

- COSMIC characteristics
- Comparison with FPA
- Benchmarking - challenge
- COSMIC Benchmarking committee
- Ways to improve benchmarking in COSMIC
COSMIC

- Second generation FSM
- Exists since end 90’s
- ISO standard!
- More widely applicable than IFPUG
  > Business application software domain
  > Realtime software domain
  > Infrastructure software domain
  > Modern development methods, like RUP
  > Modern architectures, like SOA
  > Possible to size reusable components
COSMIC Organisation

- Board
  - Legal representatives for Canadian law
- International Advisory Committee
  - Country representatives
- Measurement Practices Committee
  - Maintenance and improvement of method

- Benchmarking Committee
  - Harold van Heeringen
  - Luca Santillo
The road to version 3.0

- COSMIC founded in 1998
- 'Field Trial' COSMIC-FFP v2.0
- v2.1 – ISO 14143/1 conformant
- COSMIC-FFP ISO 19761
- v2.2 – ISO 19761 conformant
- COSMIC v3.0

Timeline:
- 1998
- 2000
- 2002
- 2004
- 2006
- 2008
COSMIC release 3.0

• Released september 2007
• Method is now stable and mature
• Many (large) organizations have adopted the method
  > Internal estimating & performance measurement processes work fine
  > But how about benchmarking processes?
Differences and similarities between FPA and COSMIC
FPA (IFPUG / NESMA)

Users Transactions

Logical files (data functions)

EI

EO

EQ

ILF

EIF
FPA in a nutshell

- Applicability of FPA is strongly dependent on the existence of a data model

- FPA grants function points to both data functions and to logical transactions

- The maximum size of data functions and logical transactions is limited
  - ILF: 7, 10 or 15 FP
  - EIF: 5, 7 or 10 FP
  - EI: 3, 4 or 6 FP
  - EQ: 3, 4 or 6 FP
  - EO: 4, 5 or 7 FP
COSMIC in a nutshell

- COSMIC is **not** dependable on the existence of a data model

- COSMIC values data movements within functional processes and does **not explicitly** reward data functions

- This value is **not limited** per functional process
  > Theoretically the size of a COSMIC functional process can be any number between 2 and infinity
### Most important differences

<table>
<thead>
<tr>
<th></th>
<th>FPA</th>
<th>COSMIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applicable on Domain</td>
<td>Business Software</td>
<td>Business, Real-time, Infrastructure Software</td>
</tr>
<tr>
<td>Data model required?</td>
<td>Required</td>
<td>Not required (but useful)</td>
</tr>
<tr>
<td>Measurement of separate components?</td>
<td>Not possible</td>
<td>Possible</td>
</tr>
<tr>
<td>Size limit per function</td>
<td>Yes</td>
<td>Size is not limited</td>
</tr>
<tr>
<td>Benchmarking data</td>
<td>Many (ISBSG R10: n=3108)</td>
<td>Few (ISBSG R10: n=110)</td>
</tr>
<tr>
<td>Measurement of processing functionality</td>
<td>No</td>
<td>No, but local extensions are possible</td>
</tr>
<tr>
<td>Early sizing</td>
<td>Based on data model</td>
<td>Based on process model</td>
</tr>
</tbody>
</table>
Possible reasons to adopt COSMIC

- New development methods → new functional documentation standards → FPA less applicable

- The organization wishes to measure software in real-time, telecommunications or infrastructure domains

- The organization wishes to measure the size of reusable components

- The organization wishes to measure more accurately. A very complex function should get more points than a complex function

- The organization is organized in a way that a department develops only part of the user functions and estimations have to be made at that department level.
Possible reasons not to adopt COSMIC

- Loads of experience data in FPA
- Organizations develop in 3GL languages in ‘old fashioned’ environments
- Lack of benchmarking data!
Benchmarking challenge

- ISBSG database R10
  - Total projects: 4,106
  - IFPUG projects: 3,108
  - COSMIC projects: 110

- Benchmarking challenge: Increase available benchmarking data in COSMIC

- COSMIC Benchmarking Committee
• **Goal**: To increase the amount of benchmarking data available to the industry

• **Initiatives**
  > Conversion formulae
  > Increase adoption
  > Lower ISBSG data submission hurdle
  > Ask for data
Initiatives - Conversion formulae

- **Method**
  - Double measurements of a number of projects by experienced analysts in both methods

- **Projects**
  - 26 projects for a variety of clients
  - New developments
  - Business applications
  - Variety of branches
  - Early requirements
  - Often low quality documentation
Initiatives - Conversion formulae

\[ N = 26 \]
\[ Y(CFP) = 1,22 \times (FP \text{ NESMA}) - 64 \]
\[ R^2 = 0.97 \]
Results

- Use one formula for the conversion
  > CFP = 1.22 FP (Nesma) – 64
  > FP (Nesma) = 0.82 (CFP) + 52
  > Projects > 200 FP

<table>
<thead>
<tr>
<th>Development tools</th>
<th>Java</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distribution of work</td>
<td>Onshore</td>
</tr>
<tr>
<td>Construction</td>
<td>0%</td>
</tr>
<tr>
<td>System test</td>
<td>0%</td>
</tr>
<tr>
<td>System test strategy</td>
<td>TMap Medium</td>
</tr>
<tr>
<td>Delivery test</td>
<td>Yes</td>
</tr>
<tr>
<td>Complexity</td>
<td>Medium</td>
</tr>
<tr>
<td>Size</td>
<td>1235 FP</td>
</tr>
<tr>
<td>Start date</td>
<td>01-08-07</td>
</tr>
</tbody>
</table>

- Advising clients: Use Transition framework
Initiatives - Increase adoption

- Translate COSMIC documents
  - Spanish
  - Italian
  - Dutch
  - Japanese
  - Chinese
  - Turkish
  - French
Initiatives - Increase adoption

- **White papers**
  - Almost 100 available
  - [www.lrgl.uqam.ca/cosmic-ffp](http://www.lrgl.uqam.ca/cosmic-ffp)

- **Topics:**
  - COSMIC + data warehouse systems
  - COSMIC + SOA architectures
  - COSMIC + Real-time systems
  - COSMIC + enhancement / maintenance
  - etcetera
Initiatives - Lower ISBSG submission hurdle

- **ISBSG**
  > Submit data and receive a benchmark report

- **Current ISBSG COSMIC questionnaire**
  > 138 questions

- **Initiatives**
  > Restructuring questionnaire: A / B / C
  > Webclient project submission
  > Export facility in tools
  > (Convert ISBSG database)
Initiatives - Ask for data

- Professional Network
- Can you help us?