

Proposals for Increasing Benchmarking Data Quantity and Quality of Projects Measured in COSMIC

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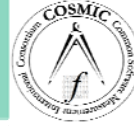
November 18th, 2008, Munich



Outline

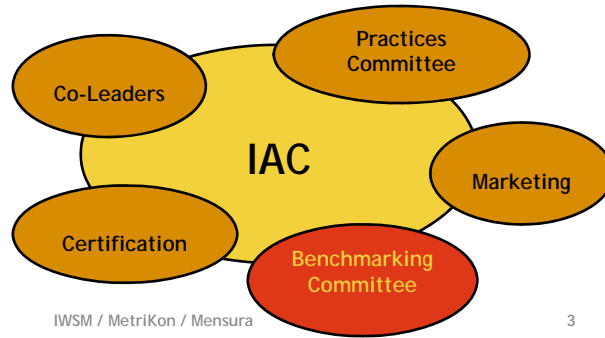


- **Introduction to COSMIC (& ISBSG)**
- **Changes in COSMIC Method 3.0**
- **COSMIC Benchmarking Committee
(Goals & Initiatives)**

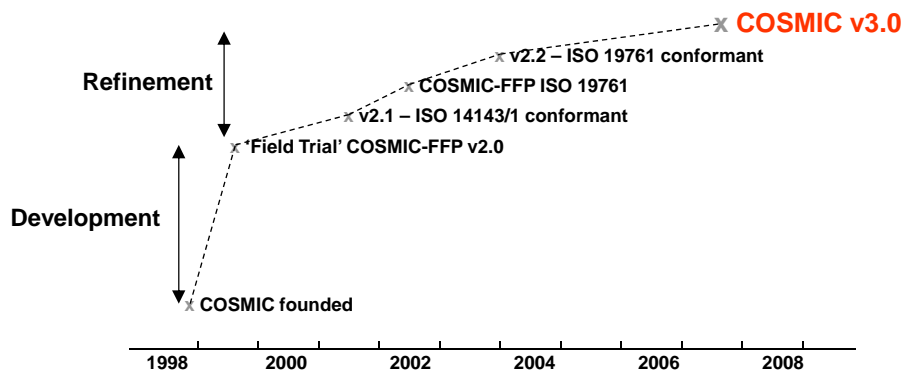


- **The Common Software Measurement International Consortium**

- > est. 1998 → 10 years now!
- > late 2007: major upgrade to Measurement Manual version 3.0



The road to version 3.0



COSMIC vs. 1st gen. methods



- **More sound**
- **Easier at the “lowest level”**
- **Flexible for complex architectures**
- **Applicable on a broader range of domains**

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Main differences from IFPUG FPA



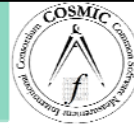
	IFPUG	COSMIC
Applicable on Domain	Business Software	Business, Real-time, Infrastructure Software
Data model required?	Required	Not required (but useful)
Measurement of separate components?	Not possible	Possible
Size limit per function	Yes	Size is not limited
Measurement of processing functionality	No	Local extensions are allowed
Early sizing	Based on data model	Based on process model

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Main changes in COSMIC v3.0



- **Documentation Structure**
 - > several docs to target separate audiences
- **Terminology**
 - > Measurement Unit "CFP" (old "Cfsu")
- **New Measurement Strategy Phase**
 - > **Decomposition Level**
 - Layers & Components
 - > **Functional Users**
 - to replace "measurement viewpoints"
 - > **Granularity Level**
 - levels of details in the requirements specifications

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Documentation Structure



OVERVIEW

Documentation
Overview &
Glossary of Terms

PRINCIPLES & RULES for the COSMIC METHOD Version 3.0:

ISO/IEC 19761:2002
COSMIC-FFP
A functional size
measurement method

Method
Overview

Measurement
Manual

Advanced &
Related Topics

← Beginners →

Practitioners →

← Experienced Practitioners →

DOMAIN-SPECIFIC SUPPORT DOCUMENTS

Guidelines
• Business v1.0
• Real-time (ftd)

Case Studies (x.n)
• Business
• Real-time

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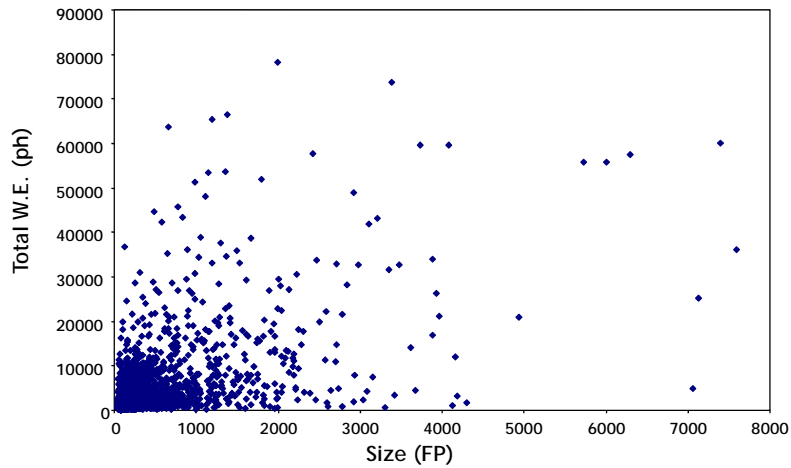
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- “To help improve the IT management through the provision and exploitation of public repositories of software engineering knowledge [...]”
- **3 repositories**
 - > Development & Enhancement projects
 - > Maintenance & Support
 - > Package Acquisition & Customisation

Dev/Enh repository (v. 10, 2006)

- **Over 4'000 projects** ([↩](#))
 - > sizing methods: IFPUG, FPA MkII, NESMA, FiSMA, COSMIC (<5%)
- **Probably represents top 25% of industry**
 - > productivity, cost, staff, schedule analysis (>100 attributes collected)
- **Questionnaire(s) freely available to provide project data**

ISBSG figures - A simple example



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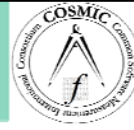
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Benchmarking Committee - Goals



- **Goal: To increase the amount of benchmarking data available to the industry**
- **Initiatives**
 - > Conversion formulae
 - > Lower ISBSG data submission hurdle
 - > Invite to submit more data
 - > Increase adoption

COSMIC Benchmarking Committee



- **“Chicken-and-egg” problem**
 - potential users seek for “benchmarking data”
 - existing users not willing to spend effort in submitting “benchmarking data”
- **Our goal**
 - > **To promote initiatives to increase the data amount (and quality) of projects measured with COSMIC for benchmarking purposes**
- **Initiatives (count 1, 2, 3, ...)**

1. Size conversion between methods



- **Convert project size from IFPUG/NESMA to COSMIC**
 - > **statistical approach**
 - > **limited domain (MIS)**

Author / year	Formula	Correlation	N
Fetcke (1999) [10]	$Y(\text{CFP}) = 1.1 (\text{IFPUG}) - 7.6$	$R^2 = 0.97$	4
Vogelezang & Lesterhuis (2003) [11] [12] [13]	$Y(\text{CFP}) = 1.2 (\text{NESMA}) - 87$ $Y(\text{CFP}) = 0.75 (\text{NESMA}) - 2.6 (<200 \text{ FP})$ $Y(\text{CFP}) = 1.2 (\text{NESMA}) - 108 (>200 \text{ FP})$	$R^2 = 0.99$	11
Desharnais & Abran (2006) [14]	$Y(\text{CFP}) = 1.0 (\text{IFPUG}) - 3$ $Y(\text{CFP}) = 1.36 (\text{IFPUG-TX}) + 0 (\text{Transactions only})$	$R^2 = 0.93$ $R^2 = 0.98$	14
Van Heeringen [15]	$Y(\text{CFP}) = 1.22 (\text{NESMA FP}) - 64$	$R^2 = 0.97$	26

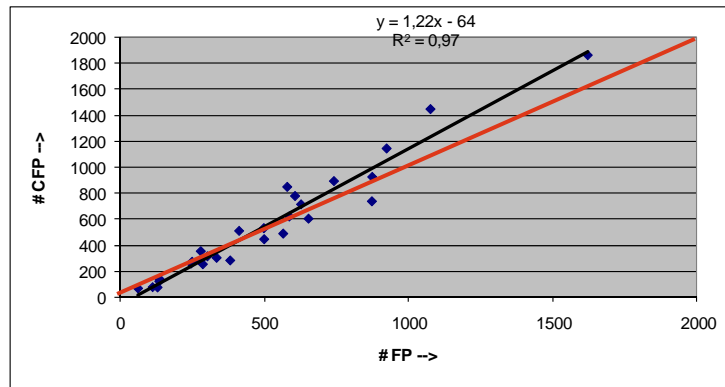
Conversion formula - Example



N=26

$Y(\text{CFP}) = 1,22 (\text{FP NESMA}) - 64$

$R^2 = 0.97$

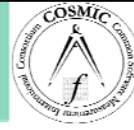


2. Improve ISBSG Questionnaire



- **Dev/Enh current questionnaire**
 - > no less than 138 questions
 - > 40+ pages (←)
- **Key questions**
 - > around 65 (50%)
- **Separate questionnaires for different sizing methods**

Improved Questionnaire (to be issued)



- **Dev/Enh proposed questionnaire**
 - > updated questions (terminology)
 - > single questionnaire
- **Key questions**
 - > max 35 (20%)
 - > short form (max 5 pages)
- **Web form to be available**
 - > to lower the submission hurdle

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3. Encourage Data Submission



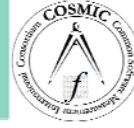
- **Invitation letter to be sent to current and potential COSMIC users**
 - > Easiness (short form)
 - > BC available for support
 - > 3-6 months submission timeframe
 - > Guaranteed confidentiality
- **Rewarding**
 - > Comparison report per project
 - > Final report out of all collected projects

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4. Increase COSMIC adoption



- **COSMIC method translations**
 - > English, French, Dutch, Spanish, Chinese
 - > Italian, Japanese, Turkish to come soon
- **Enlarge measurement coverage**
- **Contribute to the software engineering community**
- **Build more useful repositories**

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Conclusions



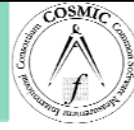
- **COSMIC method**
 - > promising at the beginning
 - > effective nowadays
- **Public benchmarking**
 - > useful for measures exploitation and industry comparison & improvement
- **BC Initiative(s)**
 - > support the community
 - > build/gain better repositories

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Thanks!



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- **COSMIC website**
> www.cosmicon.com
- **Check for details**
> **Apply for your invitation letter**