

Proposals for increasing benchmarking data quality of projects measured in COSMIC

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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

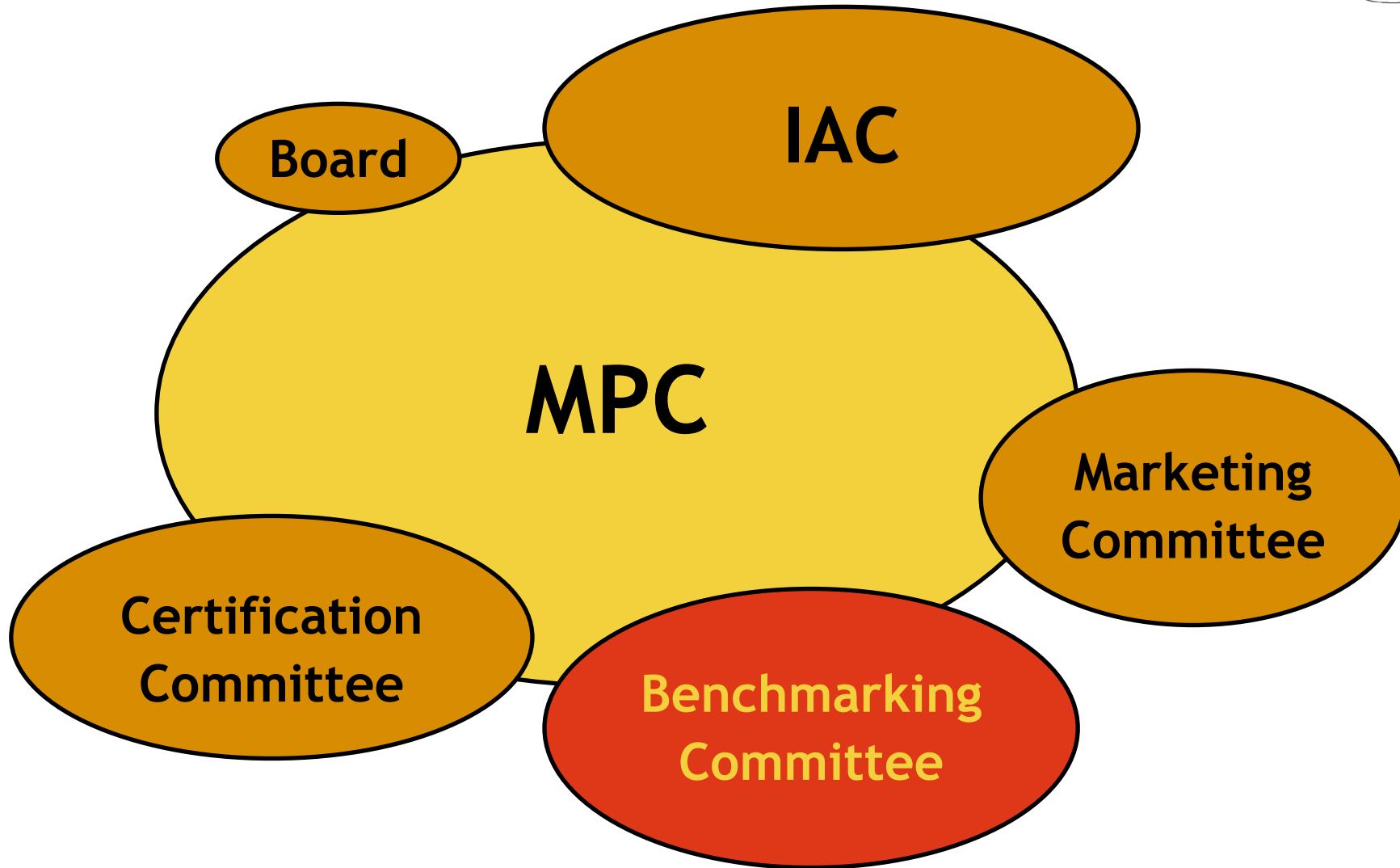
 - > Modern development methods, like RUP
 - > Modern architectures, like SOA
 - > Possible to size reusable components

COSMIC Organisation

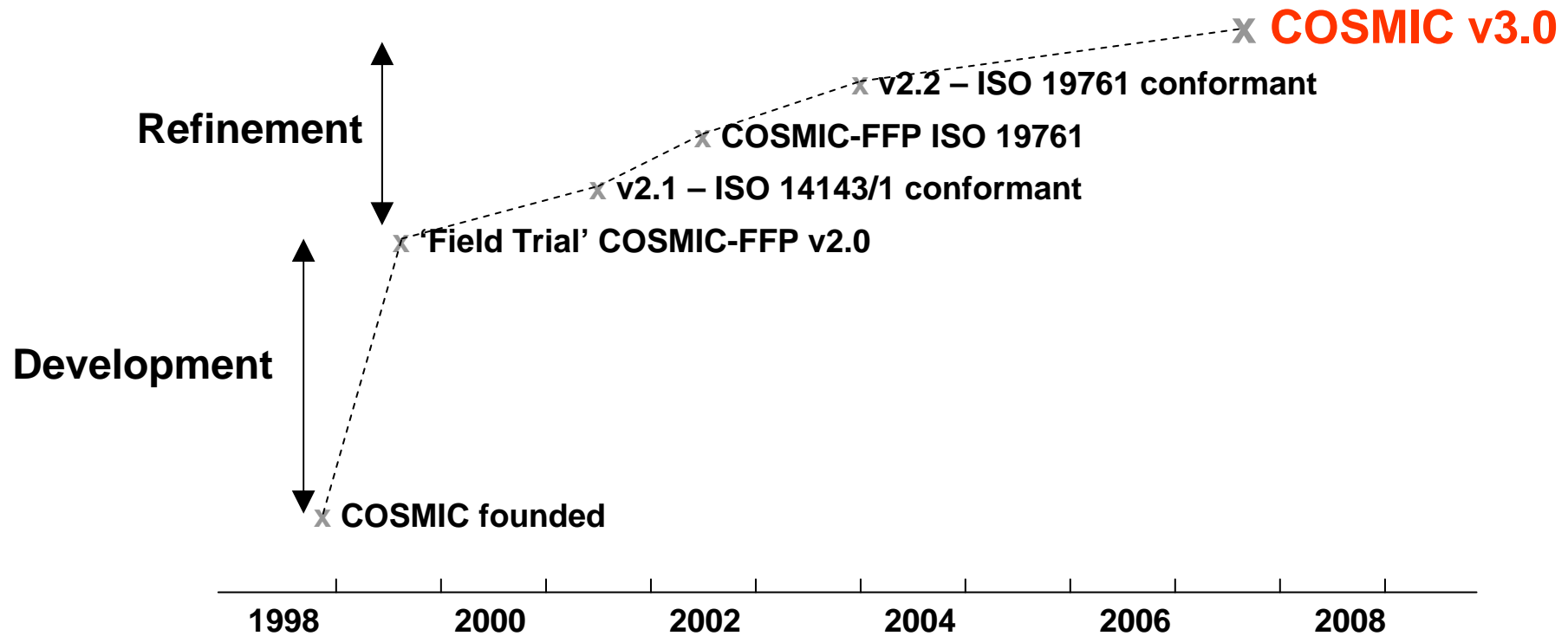


- **Board**
 - > **Legal representatives for Canadian law**
- **International Advisory Committee**
 - > **Country representatives**
- **Measurement Practices Committee**
 - > **Maintenance and improvement of method**
- **Benchmarking Committee**
 - > Harold van Heeringen
 - > Luca Santillo

COSMIC Organisation



The road to version 3.0



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?**



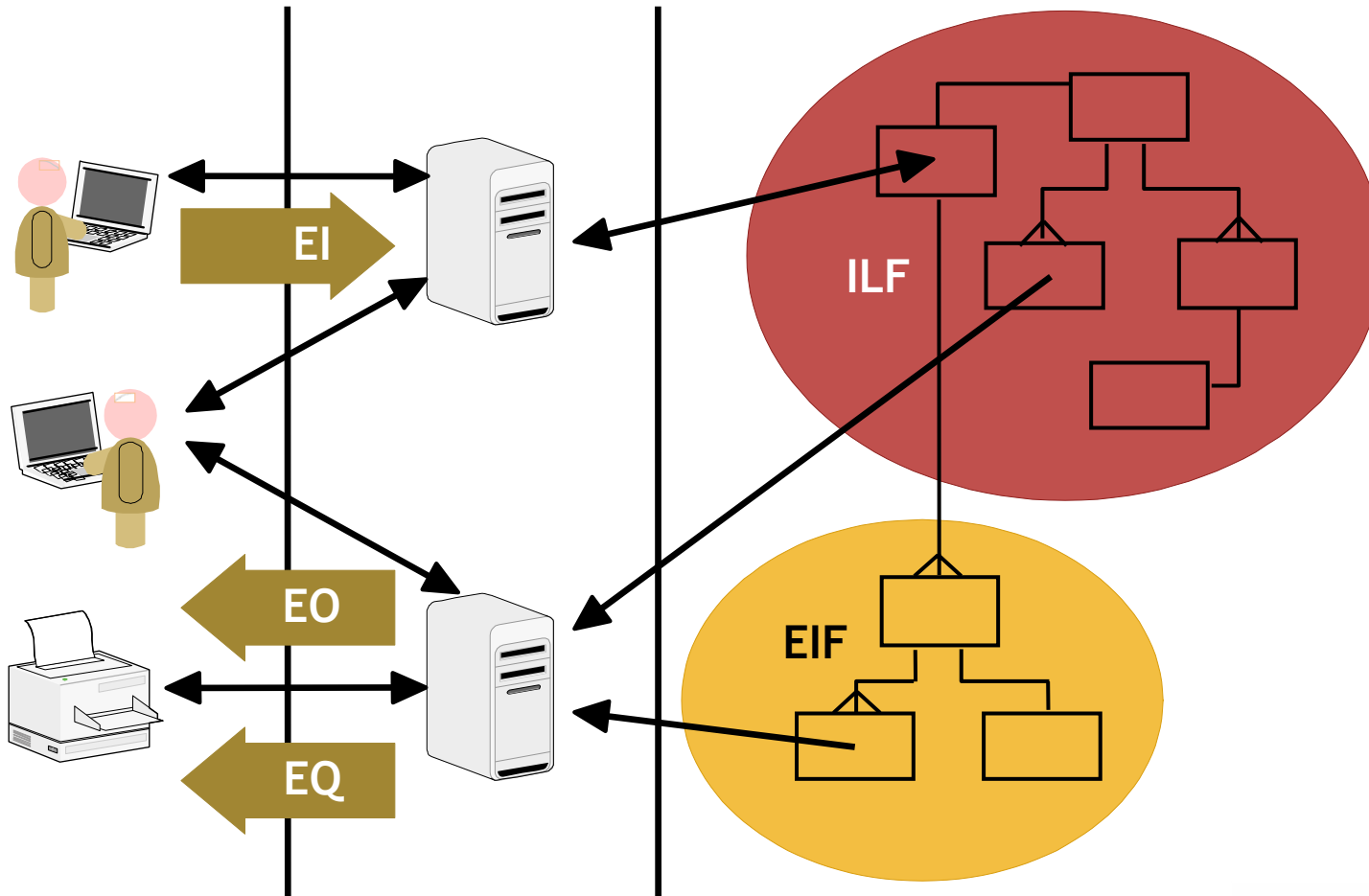
Differences and similarities between FPA and COSMIC

FPA (IFPUG / NESMA)



Users Transactions

Logical files (data functions)



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

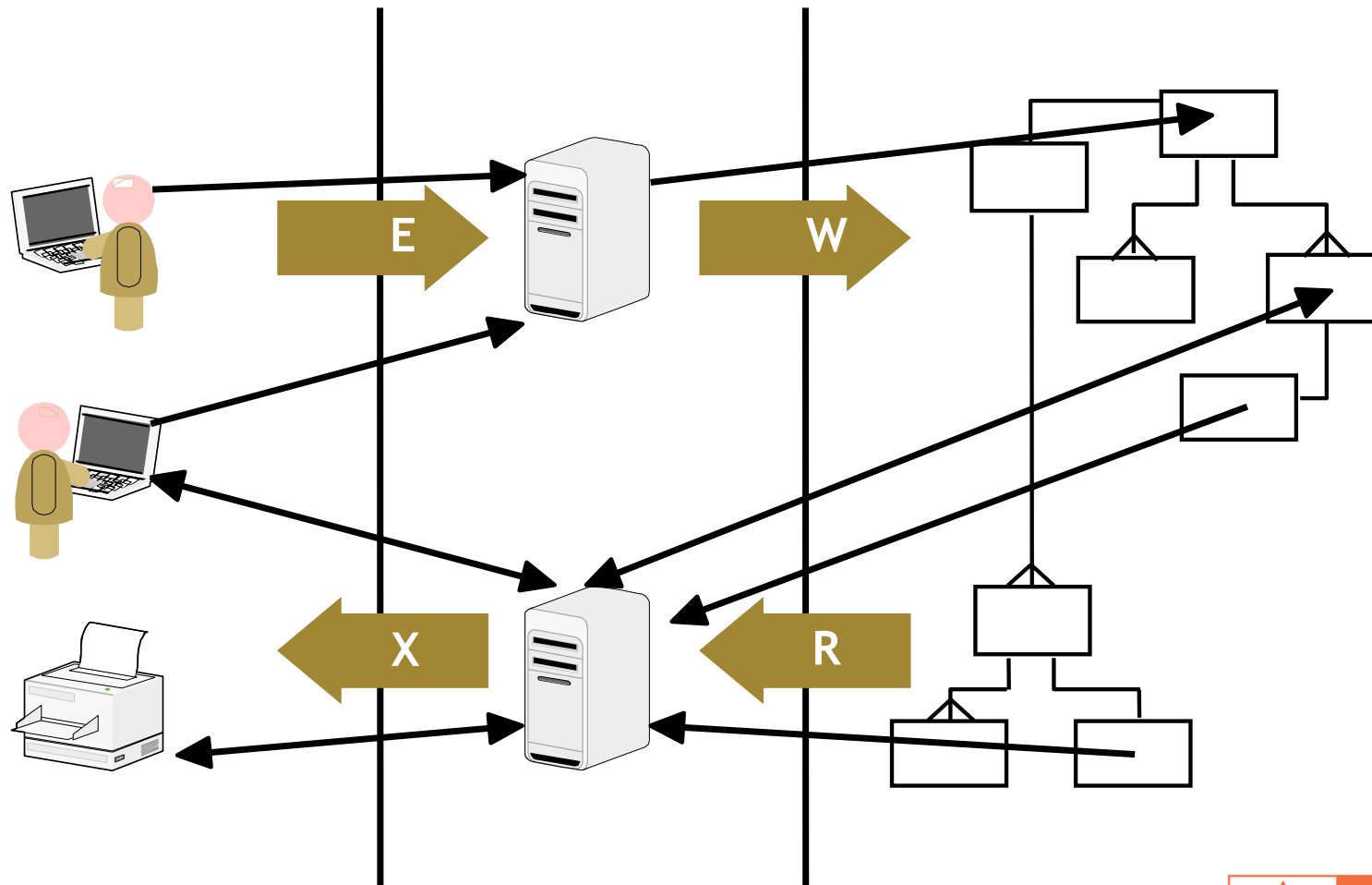
COSMIC



Users

Transactions

Data



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



	FPA	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
Benchmarking data	Many (ISBSG R10: n=3108)	Few (ISBSG R10: n=110)
Measurement of processing functionality	No	No, but local extensions are possible
Early sizing	Based on data model	Based on process model

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**

Benchmarking Committee - Goals



- **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

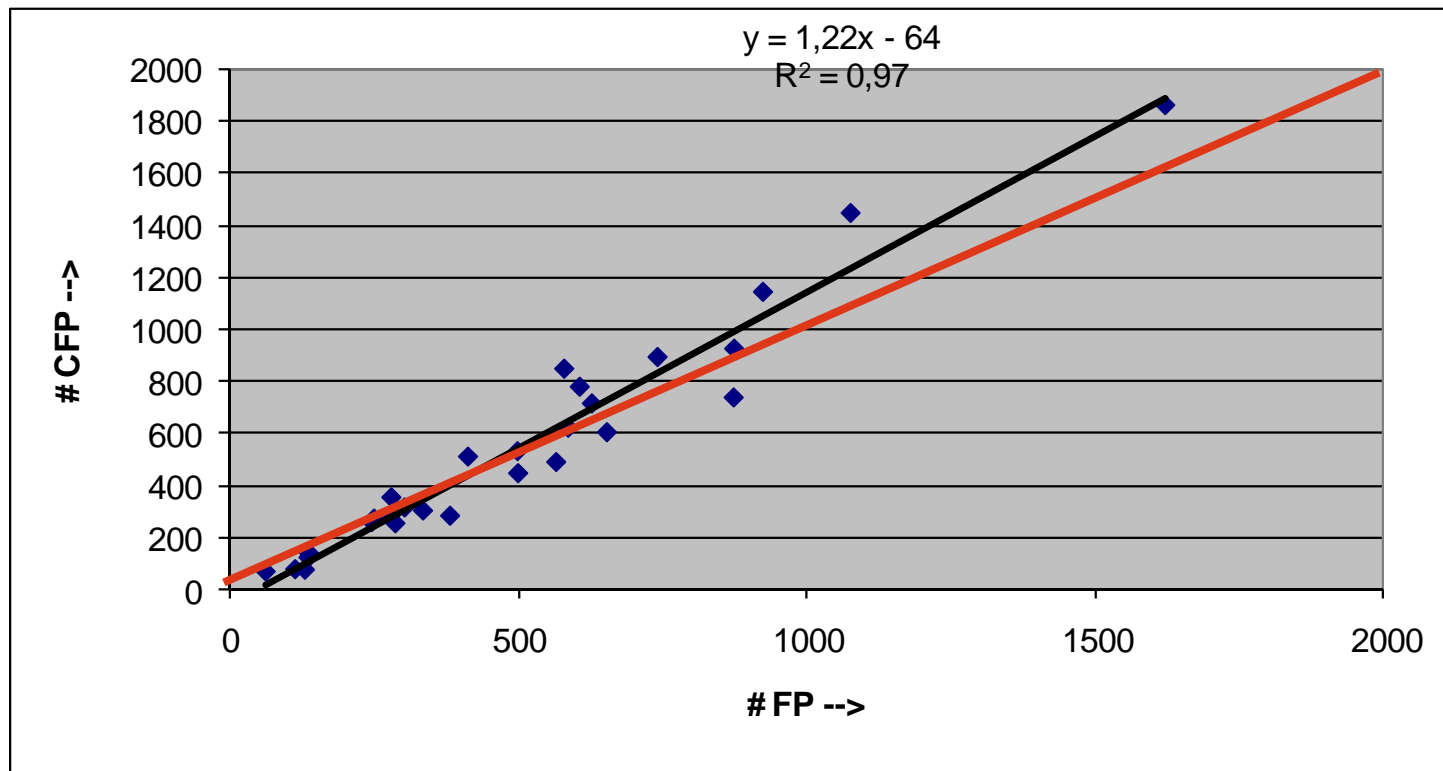
Initiatives - Conversion formulae



N=26

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

$$R^2 = 0.97$$



Results

- Use one formula for the conversion
 - > $CFP = 1.22 \text{ FP (Nesma)} - 64$
 - > $\rightarrow \text{FP (Nesma)} = 0.82 (CFP) + 52$
 - > Projects > 200 FP

Input

Development tools	Java	
Distribution of work	Onshore	Offshore
	Construction	100%
System test	0%	100%
System test strategy	TMap Medium	
Delivery test	Yes	
Complexity	Medium	
Size	1235	FP
Start date	01-08-07	

Input

Development tools	Java	
Distribution of work	Onshore	Offshore
	Construction	100%
System test	0%	100%
System test strategy	TMap Medium	
Delivery test	Yes	
Complexity	Medium	
Size	1500	COSMIC =1282 FP
Start date	01-08-07	

Duration in weeks	15	17	19	21	23	25	27
Delivery for acceptance	14-11-07	28-11-07	12-12-07	26-12-07	9-01-08	23-01-08	6-02-08
Total effort	9462	8106	7026	6342	5916	5646	5400
Effort per FP	15,77	13,51	11,71	10,57	9,86	9,41	9
Totaal cost	€ 413.352	€ 354.126	€ 306.936	€ 277.056	€ 258.414	€ 246.594	€ 236.022
Cost per FP	€ 689	€ 590	€ 512	€ 462	€ 431	€ 411	€ 393

- 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**
- **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?**





www.gelog.etsmtl.ca/cosmic-ffp

www.cosmicon.com