

Functional Size Measurement methods in the 2020 ISBSG D&E repository



Introduction

Functional size (function points) is universally considered to be the square meter of the software industry: the only international standard to measure the size of software in a standardized, objective, repeatable, verifiable and therefore defensible way. However, software buying and software producing organizations need a certain level of maturity to understand they need to measure the size of software, calculate key metrics and use these in project estimation, project control, (supplier) performance measurement and benchmarking. Especially in organizations that moved to an agile way of software development need to understand productivity and velocity based on standardized metrics, otherwise they risk projects spinning out of control fast, resulting in large cost and schedule overruns, especially when a certain amount of functionality is required to be finished on a specific date.

Typical key metrics based on function points are:

- Project Delivery Rate (PDR): Hours spent per function point
- Cost efficiency: Cost (or Price) per function point
- Quality: Defects per function point (in test and/or 1st month of production)
- Speed: Function points delivered per calendar month.

The ISBSG repository 'New Developments & Enhancements' contains thousands of completed projects for which these metrics are calculated, enabling organizations to use industry data in their analysis and decision making. There are currently 5 international methods that comply to the ISO/IEC standard for functional size measurement (14143): IFPUG, Nesma, COSMIC, FiSMA and Mark II. In this short paper the distribution of these standards in the 2020 Development & Enhancements repository is analyzed and compared to a similar analysis carried out in 2016.

The size measurement methods in the repository

In the following table, the differences between 2016 and 2020 are shown.

Size Methods	2016	2020	%
IFPUG	5793	7107	23%
Nesma	379	845	123%
COSMIC	505	738	46%
FiSMA	580	580	0%
Mark II	37	37	0%
Lines of Code	188	194	3%
Other	33	88	167%
Total	7515	9589	28%

Table 1: distribution of size methods (all submissions) compared between the 2016R1 release and the 2020 release of the ISBSG D&E repository)

It seems that IFPUG, Nesma and COSMIC are the most used methods in the industry, and projects measured in these standards are regularly submitted to ISBSG. No projects measured in the FiSMA and Mark II standards have been received in the last years.

In the next table, the percentages are compared.

Size Methods	2016	2020
IFPUG	77%	74%
Nesma	5%	9%
COSMIC	7%	8%
FiSMA	8%	6%
Mark II	0%	0%
Lines of Code	3%	2%
Other	0%	1%
Total	100%	100%

Table 2: Percentage of size methods (all submissions) compared between the 2016R1 release and the 2020 release of the ISBSG D&E repository)

Between 2016 and 2020 approximately 2000 projects were added to the repository. IFPUG is still by far the predominant method, but the percentage of projects measured in IFPUG is slowly declining, while especially the percentage of Nesma projects is rising.

The size measurement methods by industry

The distribution of the methods used over the industries is given in the next table.

2020 Industry Type	N	IFPUG	Nesma	COSMIC
Banking	892	63%	4%	23%
Communication	2131	87%	7%	2%
Construction	72	29%	32%	25%
Defence	21	71%	0%	29%
Education	36	25%	0%	75%
Electronics & Computers	191	71%	0%	17%
Financial	437	88%	7%	0%
Government	821	54%	27%	5%
Insurance	1444	53%	7%	17%
Manufacturing	859	80%	3%	9%
Medical & Health Care	513	98%	0%	1%
Professional Services	64	86%	33%	6%
Service Industry	29	76%	3%	12%
Utilities	109	58%	36%	2%
Wholesale & Retail	158	66%	15%	4%

Table 3: 2020 distribution of size methods per industry type

Most submitted projects are from the Communication, Insurance, Government and Manufacturing industries. The IFPUG method is predominant in most industries, except for the construction and education industries.

Conclusion

There are 5 ISO certified methods for functional size measurement, but only 3 of them are being used intensively nowadays: IFPUG, Nesma and COSMIC. IFPUG is predominant in the industry and most of the 2000 added projects between 2016 and 2020 have been measured in IFPUG. However, the percentage of IFPUG projects in 2020 has dropped from 77% to 74%, which is the result of a relatively high number of Nesma and COSMIC projects added in that period. There are large differences in projects submitted per industry, where most projects come from the Communication, Insurance, Government and Manufacturing industries.

The International Software Benchmarking Standards Group (ISBSG)

The ISBSG is a not-for-profit organization founded in 1997 by a group of national software metrics associations. Their aim was to promote the use of IT industry data to improve software processes and products.

ISBSG is an independent international organization that collects and provides industry data of software development projects and maintenance & support activities in order to help all organizations (commercial and government, suppliers and customers) in the software industry to understand and to improve their performance and decision making. ISBSG sets the standards of software data collection, software data analysis and software project benchmarking processes and is considered to be the international thought leader in these practices.

The ISBSG mission is to support commercial and public organizations to improve the estimation, planning, control and management of IT software projects and/or maintenance and support contracts.

To achieve this:

ISBSG maintains and grows 2 repositories of IT software development/maintenance & support data. This data originates from trusted, international IT organizations and can be obtained for a modest fee from the website www.isbsg.org/project-data/

Help us to collect data

ISBSG is always looking for new data. In return for your data submission, we issue a free benchmark report that shows the performance in your project or contract against relevant industry peers.

Please submit your data through one of the forms listed on <http://isbsg.org/submit-data/>

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