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Short paper

An analysis of XL projects in the 2023 ISBSG D&E Repository

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Introduction

The International Software Benchmarking Standards Group (ISBSG) plays a pivotal role in advancing the field of software cost estimation. It offers a treasure trove of data that holds immense value for organizations and professionals in the software development industry.

ISBSG data is a rich repository of historical project information, encompassing a wide array of software development endeavors across diverse industries and domains. This data allows for the extraction of invaluable insights, enabling more accurate and informed software cost estimation.

In this era of increasing technological complexity and growing demand for precise project planning, ISBSG data is an indispensable resource, facilitating better decision-making, risk management and cost optimization in the realm of software development.

The ISBSG collects industry data, where output is measured using ISO/IEC standardized and therefore objective, repeatable, auditable methods, such as Nesma, IFPUG and COSMIC function points.

Typical key metrics based on function points are:

- Project Delivery Rate (PDR)[1]: 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)

[1] The PDR is the inverse of the universal concept of Productivity (output/input) as it is easier to process for human minds, which usually struggles with metrics with many decimals.

- Delivery Speed: Function points delivered per calendar month.

The ISBSG 'New Developments & Enhancements' repository contains thousands of completed projects for which these metrics are calculated, enabling organizations to use this industry data for fact-based understanding and decision making.

In this short paper, we will look at the XL (extra-large), XXL (extra-extra-large) and XXXL (extra-extra-extra-large) projects in the ISBSG database, which have a functional size greater than 3000 Nesma or IFPUG function Points.

XL Projects (size > 3000 function points)

Filtering the 11848 projects (i.e. data points) in the D&E repository on the field Relative Size = XL, XXL or XXXL, measured in Nesma or IFPUG, results in only 82 data points. In this short paper, we take a look into this dataset of 82 projects.

Figure 1 shows the Project Delivery Rate, in effort hours spent per function point, delivered for projects greater than 3000 FP in size from the ISBSG repository.

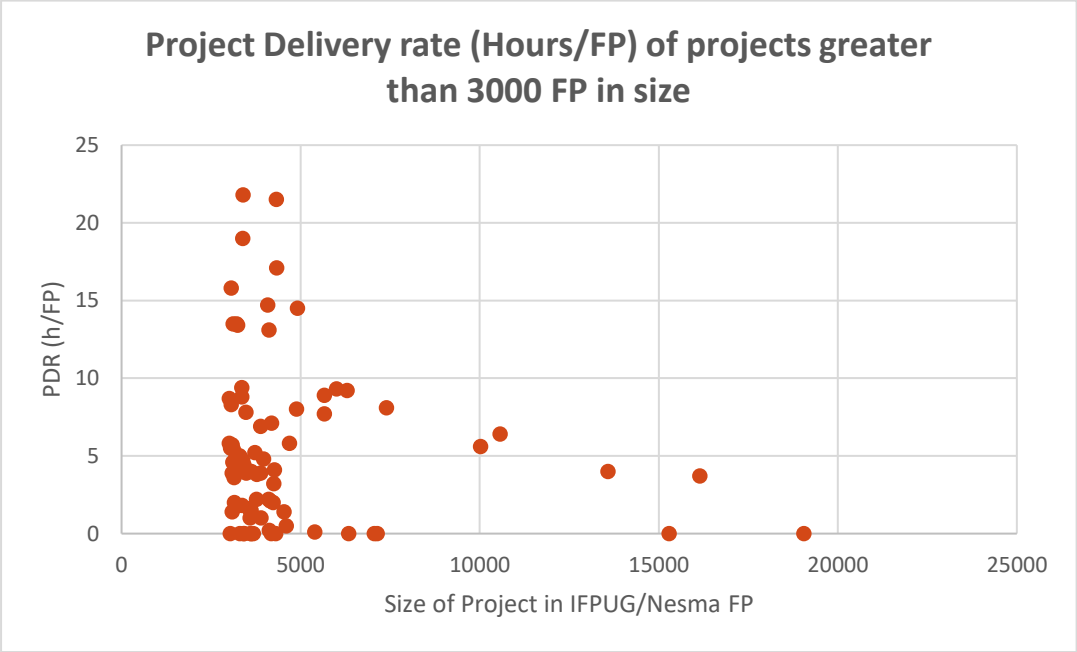

Figure 1: Project Delivery rate (Hours/FP) of projects greater than 3000 FP in size

It should be noted that data submitted to ISBSG relates to completed projects is. For larger projects, the success rate can drop significantly and these will not be submitted to ISBSG. It is also important to note that where agile development principles are used, large development projects are delivered in smaller increments. Therefore data for these projects is submitted as enhancement projects, by release.

In the Figure 2, the primary programming language is shown for projects greater than 3000 FP in size from the ISBSG repository.

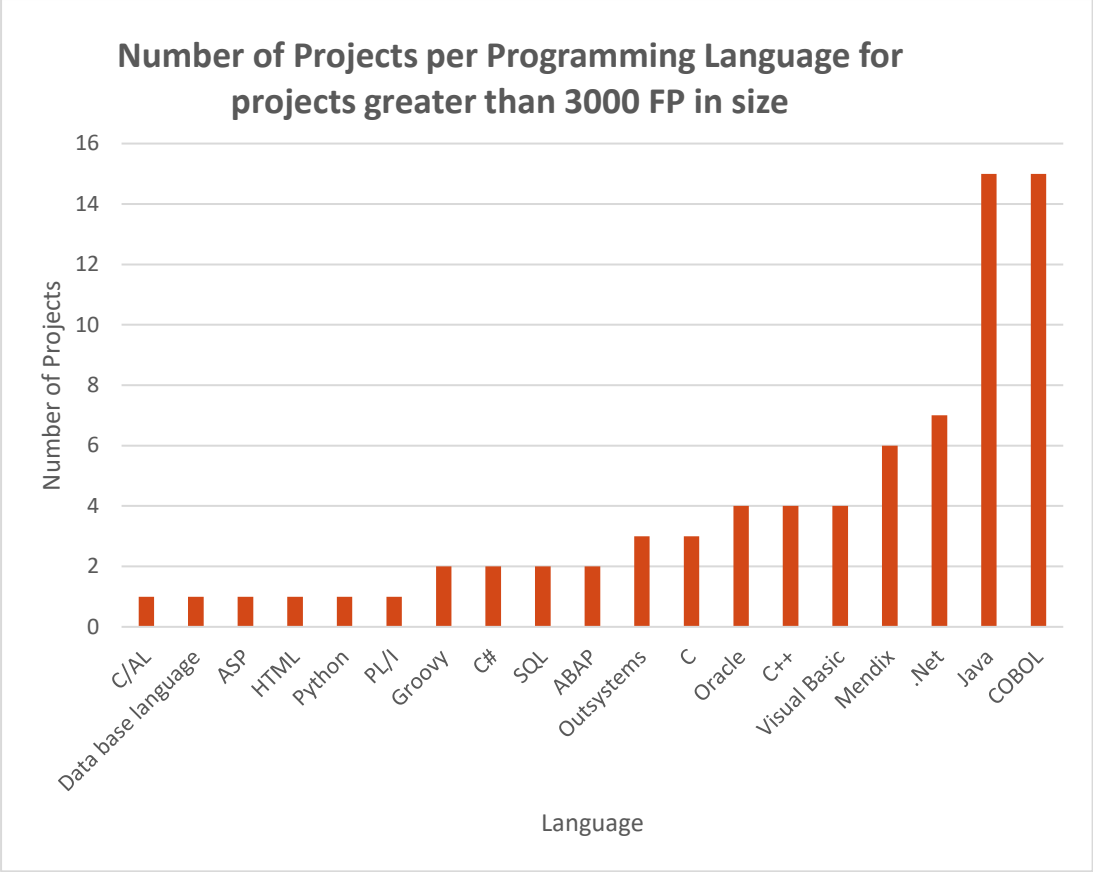

Figure 2: Primary programming languages of projects greater than 3000 FP in size

The most popular programming languages of large projects are the typical 3GL languages Cobol and Java, as shown in Figure 2.

It's remarkable to note that there are XL, XXL or XXXL-sized projects with modern, 'low-code', model-based languages like Mendix and Outsystems. Organizations considering the rebuild of critical legacy applications with low-code options can understand the producitivity and cost efficiency when building the business case. ISBSG has published a short paper specifically on this subject, which can be found here: https://www.isbsg.org/wp-content/uploads/2023/01/Short-Paper-2022-09-The-Business-Case-of-Rebuilding-Legacy-Applications.pdf

Figure 3 shows the industry sectors in which projects greater than 3000 FP in size from the ISBSG repository, have been implemented.

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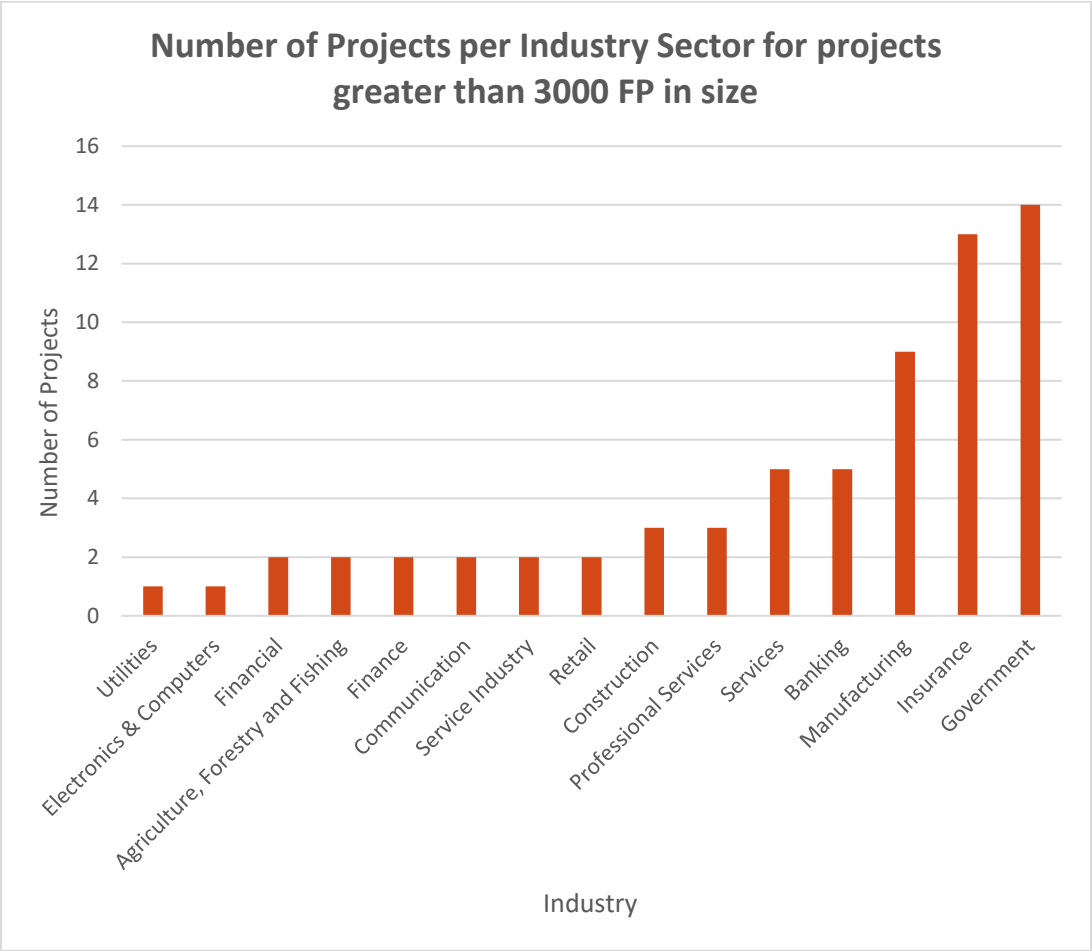

Figure 3: Distribution of industry sector of the projects greater than 3000 FP in size

Figure 3 shows that industry sectors such as Government, Finance (Insurance and Banking) and Manufacturing are more likely to carry out large succesful projects.

Figure 4 shows the duration, in calendar months, of these projects greater than 3000 FP in size from the ISBSG repository.

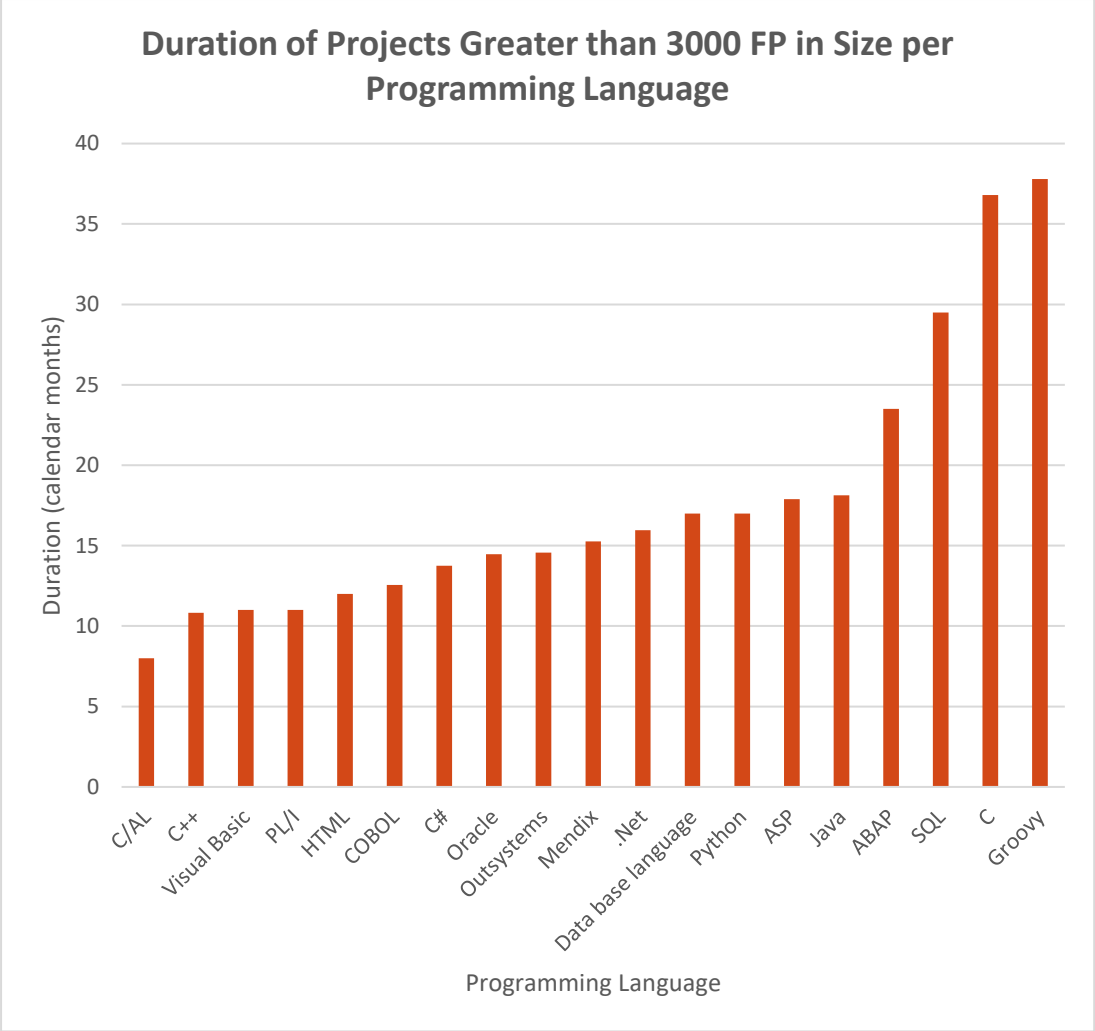

Figure 4: Duration of projects, grouped by their primary programming language, greater than 3000 FP in size

Figure 5 shows the year of completion of projects greater than 3000 FP in size from the ISBSG repository.

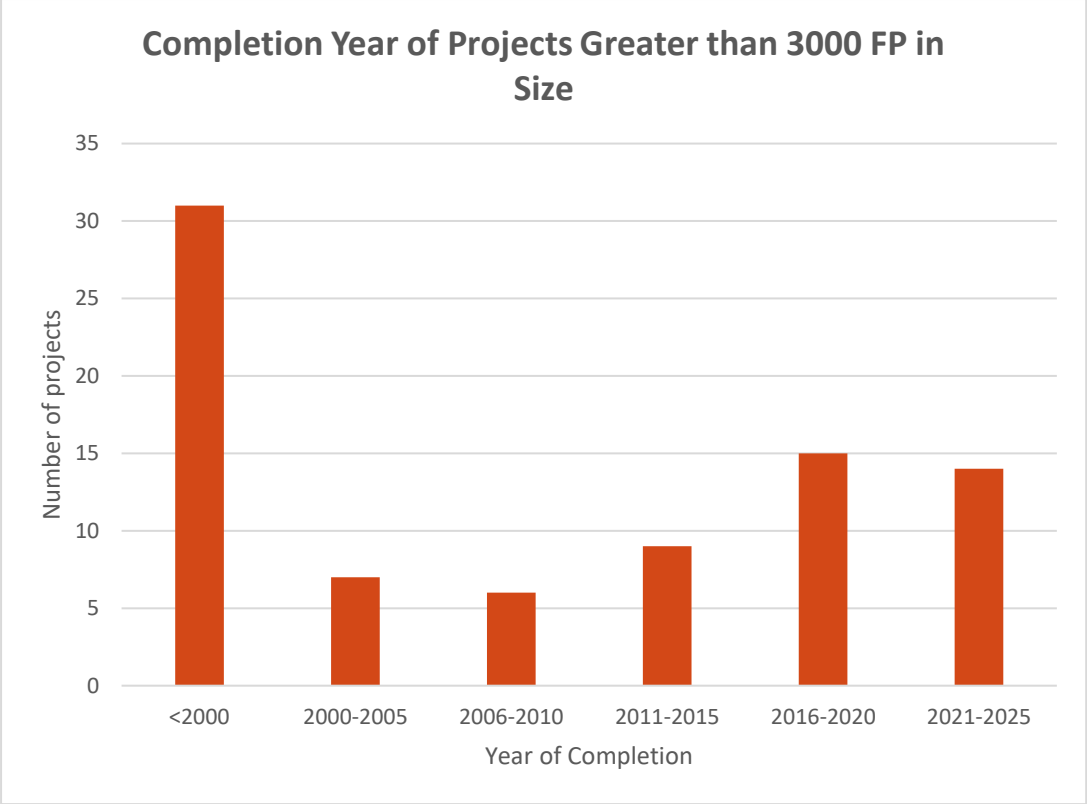

Figure 5: Distribution of completion year of the projects over 3000 FP

The figure shows that despite the trend towards agile software development, and therefore smaller and incremental deliveries, there are XL projects delivered nowadays.

In Figure 6 the delivery speed range is shown for projects greater than 3000 FP in size from the ISBSG repository. Delivery Speed is the functional size delivered per calendar month.

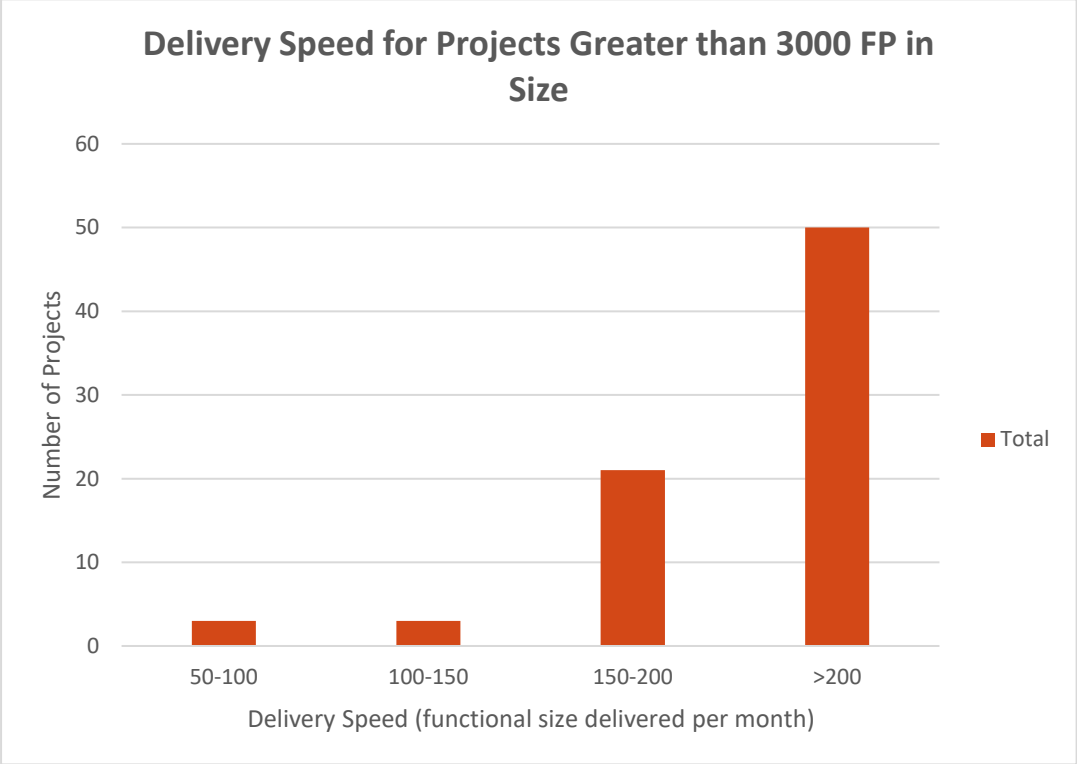

Figure 6: Distribution of Speed Range of the projects over 3000 FP

The figure shows that most of the projects are delivered quite fast with a delivery speed over 200 Nesma/IFPUG function points per month.

Conclusion

In this short paper, a dataset of XL (extra-large), XXL (extra-extra-large) and XXXL (extra-extra-extra-large) projects sized using Nesma or IFPUG function points. Specific characteristics of the data were analyzed - Project Delivery Rate (hours spent per function point delivered), Speed, Industry sector, programming language, duration and year of completion. There are many other aspects that are worth analyzing as well.

If you wish to do your own analysis, or if you are interested to use the ISBSG data for cost estimation, benchmarking, performance measurement, procurement, etc., please subscribe to the data here: https://www.isbsg.org/project-data/

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. This is 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. ISBSG 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/

A specific Agile/Scrum data collections questionnaire can be downloaded here: https://cutt.ly/4vnuXVT

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