

# Use Case: Benchmarking Agile Development Teams



## Introduction

The ISBSG repository contains a vast array of project data. It includes data for projects undertaken in an agile way of working. This enables analysis of the differences between traditional projects and agile projects.

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

The ISBSG 'New Development & Enhancement' repository contains thousands of completed projects for which these metrics are calculated. This allows organizations to make better decisions based on facts instead of opinions.

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**In this short report we will investigate the benchmarking of agile development teams.**

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<sup>1</sup> 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

## Introduction

The International Software Benchmarking Standards Group (ISBSG) provides a robust repository of software development project data. This enables organizations to benchmark their performance against industry standards.

Benchmarking agile development teams is critical for organizations aiming to optimize productivity, delivery speed, cost efficiency, and process quality.

This report outlines the process of benchmarking agile development teams at a large Turkish telecom provider company, utilizing ISBSG data. The company sought to evaluate multiple internal agile teams developing Java-based applications. Their goal was to identify performance gaps, improve operational efficiency, and align with industry best practices. By leveraging ISBSG's comprehensive dataset, this benchmarking effort provided actionable insights to enhance the company's software development processes.

## Problem Statement

The Turkish telecom provider faced challenges in objectively assessing the performance of its internal agile development teams, working on Java-based projects.

Despite adopting agile methodologies, the company lacked a standardized approach to measure critical performance indicators such as productivity, delivery speed, cost efficiency, and process quality. Without external benchmarks, it was difficult to determine whether the teams were performing optimally or how they compared to industry standards.

The absence of data-driven insights hindered the company's ability to identify inefficiencies, allocate resources effectively, and implement targeted improvements.

This report addresses the need for a structured benchmarking process using ISBSG data to evaluate the agile teams' performance and provide a foundation for continuous improvement.

## Benchmarking Process Using ISBSG Data

The benchmarking process used to evaluate the agile development teams, at the Turkish telecom provider, used ISBSG data. It involved a structured, data-driven approach to measure productivity, delivery speed, cost efficiency, and process quality. The process was designed to compare the company's internal performance

metrics against ISBSG's industry benchmarks to identify gaps and opportunities for improvement. Below is a detailed explanation of the steps involved:

### 1. Define Objectives and Metrics

The first step is to establish clear objectives for the benchmarking exercise, aligning with the company's goals to assess productivity, delivery speed, cost efficiency, and process quality. Key performance indicators (KPIs) are defined, including:

- **Productivity:** Function points delivered per person-month.
- **Delivery Speed:** Time taken to complete a functional unit or sprint.
- **Cost Efficiency:** Cost per function point or project.
- **Process Quality:** Defect rates and adherence to agile practices (e.g., sprint velocity consistency, backlog health).

These metrics are tailored to the company's Java-based agile development context and aligned with ISBSG's data structure.

### 2. Collect Internal Data

Data is gathered from the company's agile teams to establish a baseline for comparison. This includes:

- **Project Data:** Size of deliverables (measured in function points using Nesma, IFPUG or COSMIC standards), effort hours, and team size.
- **Time Metrics:** Sprint durations, cycle times, and release frequencies.
- **Cost Data:** Development costs, including labor and tools.
- **Quality Metrics:** Defect counts, resolution times, and agile process metrics (e.g., retrospective outcomes, sprint burndown charts).

Data collection is standardized to ensure compatibility with ISBSG's dataset, with a focus on Java-based projects to maintain relevance.

### 3. Select Relevant ISBSG Data

The ISBSG repository is queried to extract a comparable dataset. Filters are applied to select projects that match the company's context:

- **Development Type:** Agile methodologies.
- **Technology:** Java-based development.
- **Industry:** Telecommunications or similar domains.

- **Project Size and Complexity:** Projects with similar function point counts and team sizes.

ISBSG's dataset provides metrics such as effort per function point, delivery rates, and defect densities, which are used as industry benchmarks.

#### 4. Normalize and Compare Data

To ensure a fair comparison, internal and ISBSG data are normalized. For example:

- Function points are standardized using the same measurement method (e.g., IFPUG).
- Effort and cost data are adjusted for regional differences, such as labor costs in Turkey versus global averages.

A comparative analysis is conducted to calculate performance ratios (e.g., company productivity vs. ISBSG median) and to identify deviations. For instance, if the company's productivity is 10 function points per person-month compared to ISBSG's median of 15, this indicates a productivity gap.

#### 5. Analyze Results and Identify Gaps

The comparison results are analyzed to pinpoint areas of strength and weakness. Key questions include:

- Are the teams delivering at or above industry-standard productivity rates?
- Is the delivery speed (e.g., cycle time) competitive with ISBSG benchmarks?
- Are development costs aligned with industry norms for similar Java projects?
- Do defect rates indicate high process quality compared to ISBSG data?  
Statistical tools, such as quartile analysis or benchmarking dashboards, are used to visualize how the company's teams rank (e.g., top 25%, median, or bottom 25%).

#### 6. Develop Recommendations

Based on the identified gaps, actionable recommendations are formulated. For example:

- **Productivity:** If below industry benchmarks, consider pair programming or automated testing to reduce effort per function point.
- **Delivery Speed:** Streamline sprint planning or reduce technical debt to shorten cycle times.
- **Cost Efficiency:** Optimize resource allocation or adopt cost-effective tools.

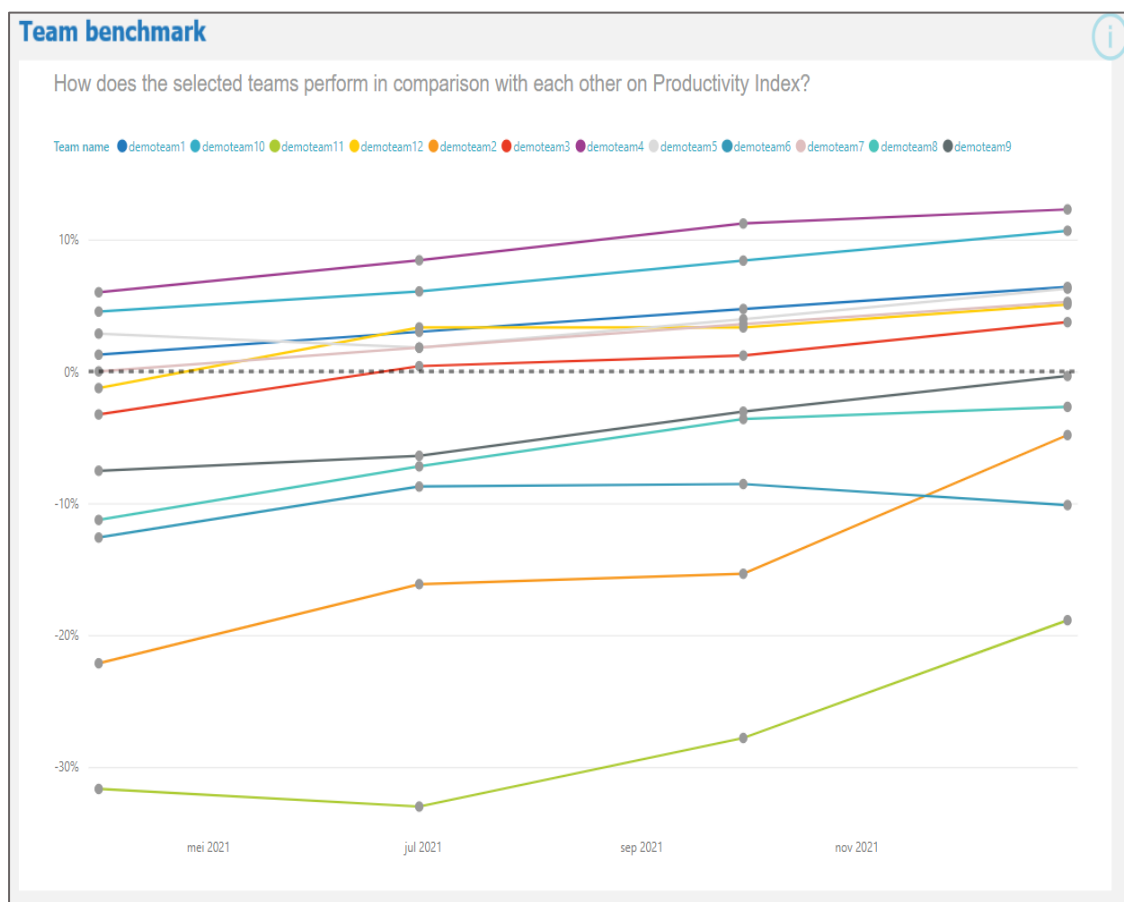
- Process Quality: Implement stricter code reviews or enhance agile coaching to lower defect rates.

Recommendations are prioritized based on impact and feasibility, with timelines for implementation.

## 7. Monitor and Iterate

Benchmarking is not a one-time activity. A plan is established to periodically collect new internal data and compare it against updated ISBSG benchmarks. This ensures continuous improvement and tracks the impact of implemented changes. Regular reviews, such as quarterly benchmarking reports, help sustain alignment with industry standards. On the team level, this gives great insights, especially when looking at the trends.

To understand team performance, calculate “indices”, which is the percentage of under or over performance compared to the ISBSG industry average (median). For instance a 20% better-than-industry-average productivity would result in a Productivity Index of 20%. Figure 1 shows an example.



**Figure 1: Team performance benchmark dashboard showing the relative performance of teams against industry average**

This allows management to understand the differences between teams which allows them to start improvement initiatives for teams that can use this.

## Conclusions

The benchmarking process using ISBSG data provided the Turkish telecom provider with a rigorous, data-driven framework to evaluate its agile development teams. By systematically collecting internal data, comparing it against ISBSG's industry benchmarks, and deriving actionable insights, the company was able to enhance productivity, delivery speed, cost efficiency, and process quality. This structured approach ensures that the teams remain competitive and aligned with global best practices in Java-based agile development.

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. The aim 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 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/](http://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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