

Inhouse versus Outsourced Application Development



Introduction

As the ISBSG repository contains more data for projects carried out in an agile way of working, analysis of the differences between traditional projects and agile projects becomes more significant.

The ISBSG collects industry data, where output is measured using ISO/IEC standardized and therefore objective, repeatable, auditable methods. These include 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)
- Speed: Function points delivered per calendar month.

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

In the IT industry, many organizations have software development experts on the payroll. They also have internal application development teams that develop the software for the organization. This may be applications they use internally, but also applications they provide to customers and/or users external to the company. Other organizations may outsource the application development function to one or more specialized external companies.

In this short paper, we examine the differences in productivity and delivery speed between in-house and outsourced application development.

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.

Inhouse Application Development

In-house application development, also known as insourcing, is the process of building software applications using your own company's internal resources and employees. This means your team of developers, designers, project managers, and other necessary personnel are all directly employed by your organization and work within your company structure to create the application. Some key points about in-house development:

Who does the work?

- Your own employees, with the required skillsets, handle all aspects of the development process.
- You may need to hire new employees or upskill existing ones to fill any gaps in expertise.

Benefits:

- **Stronger control:** You have direct control over the project, team, and development process.
- **Deep understanding of needs:** Your team is intimately familiar with your company's specific needs and culture, leading to better tailored solutions.
- **Improved communication and collaboration:** Easier communication and collaboration between developers and other stakeholders within the company.
- **Intellectual property (IP) ownership:** You retain full ownership of the developed application and its source code.
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Challenges:

- **Higher costs:** Building and maintaining an in-house development team can be expensive, including salaries, benefits, infrastructure, and tools.
- **Limited expertise:** You may not have the necessary range of expertise within your company for complex projects.
- **Finding and retaining talent:** Attracting and keeping skilled developers can be challenging in a competitive market.
- **Slower time to market:** Building a team and developing the application internally can take longer than outsourcing.

When to consider in-house development:

- You have a clear understanding of your specific needs and require a highly customized solution.
- You need tight control over the development process and IP ownership is crucial.
- You have the budget and resources to build and maintain an in-house development team.

Outsourced Application Development

Outsourcing application development simply means entrusting the building of your software to an external company or team of developers, instead of relying on your own internal resources. This external partner takes on the responsibility for the entire development process, from planning and design to coding, testing, and deployment.

Some key points about outsourced development:

Who does the work?

- Developers employed by the external company, specializing in different aspects of app development.
- You collaborate with the company's project manager to ensure they understand your needs and vision.

Benefits:

- **Cost-effective:** Can be significantly cheaper than building an in-house team, especially for complex projects.
- **Access to expertise:** Tap into a wider pool of skilled developers who might be unavailable in-house.
- **Faster time to market:** Leverage the external team's existing infrastructure and experience for quicker development.
- **Focus on core business:** Free up your resources to focus on other aspects of your company.

Challenges:

- **Less control:** Less direct influence over the development process and team compared to in-house.
- **Communication barriers:** Potential communication challenges due to time zone differences, language barriers, or cultural differences.
- **IP considerations:** Carefully define IP ownership rights in the contract to avoid legal disputes.
- **Finding the right partner:** Selecting a reliable and trustworthy outsourcing company is crucial.

When to consider outsourcing:

- You need to develop an app quickly and cost-effectively.
- You lack the necessary expertise or resources in-house.
- You want to focus on your core business competencies.

The decision between in-house and outsourced development depends on your unique needs, budget, available resources, and project requirements.

Carefully weigh the pros and cons of each approach before making your choice.

Comparing In-House or Outsourced Application Development

Ultimately, the decision between in-house and outsourced development depends on your specific needs, budget, resources, and project requirements.

Many organizations consider application development crucial for their organization since much of the value they provide to their customers is through software. Therefore, many organizations wish to use internal teams as much as possible. However, the labor shortage in the IT industry is a hindering factor, so there is still much outsourcing in the industry.

In Figure 1, the total number of data points (i.e. projects) for in-house and outsourced projects in the 2023 Developments & Enhancements data repository is shown.

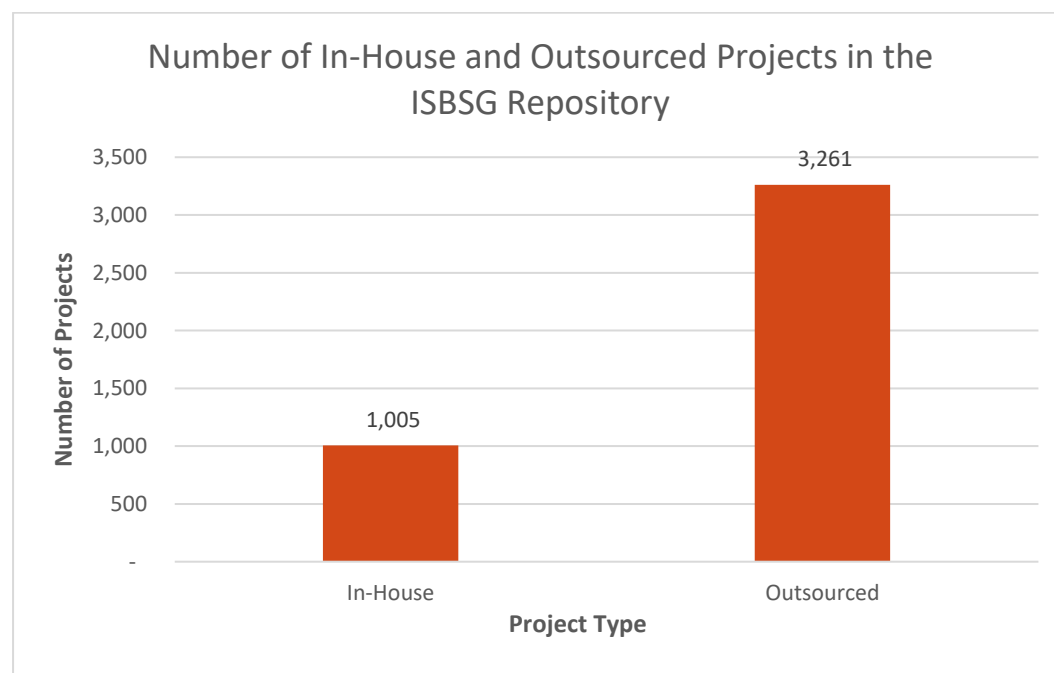


Figure 1: The total number of In-house and Outsourced data points in the ISBSG Repository

Application Development metrics

In this short paper, we look at two key metrics for application development:

- **Project Delivery Rate:** Effort hours spent per function point delivered.
- **Delivery Speed:** Function Points delivered per calendar month.

The dataset analyzed is selected from the ISBSG Repository, based on the following criteria:

- Data Quality Rating: A or B (indicating high data quality)
- Count Approach: IFPUG 4+ or Nesma
- Primary Programming Language: Java
- Intended market: in-house or outsourced

This results in a dataset of 564 data points: 200 in-house and 364 outsourced projects.

Figure 2 displays statistics (i.e. 25th, 50th and 75th percentiles) for the functional size of in-house and outsourced projects in the ISBSG Repository.

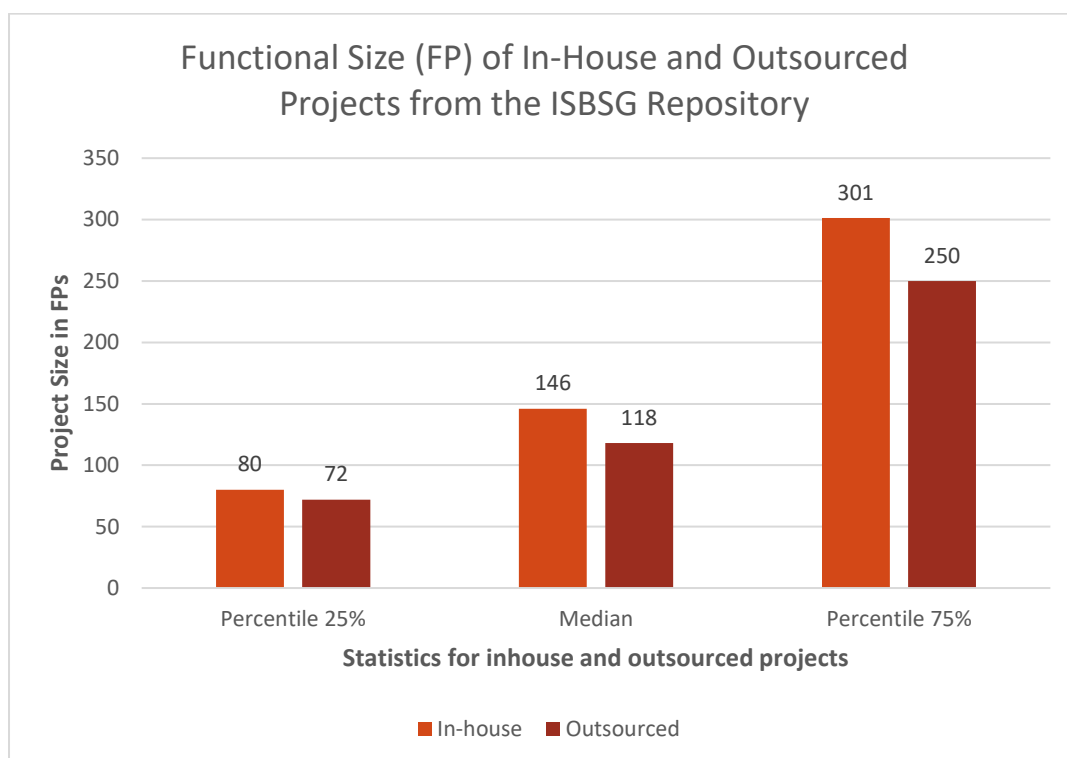


Figure 2: The P25, median and P75 functional size of inhouse and outsourced projects from the ISBSG Repository

Project Delivery Rate

Figure 3 displays the differences in Project Delivery Rate between in-house and outsourced projects.

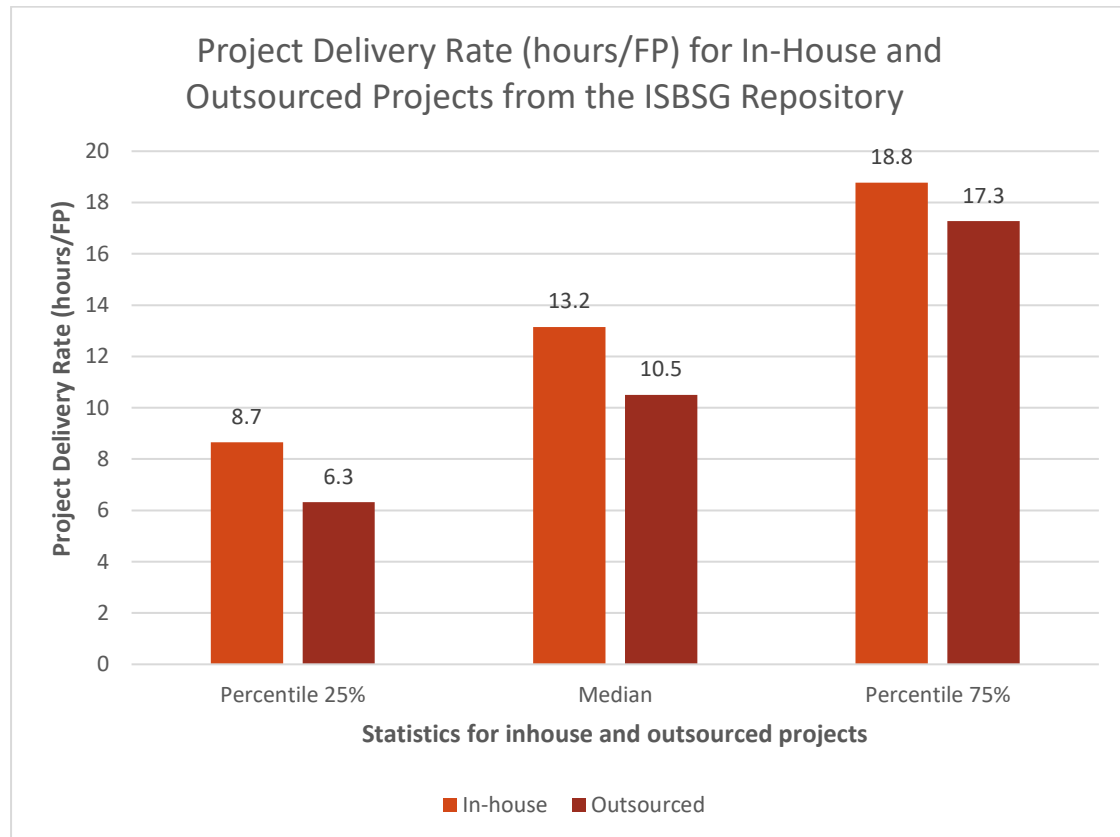


Figure 3: The P25, median and P75 PDR of the inhouse and outsourced projects

Figure 3 indicates that the outsourced projects have been carried out more productively. The median PDR of Outsourced projects is almost 2.7 hours/FP lower than in-house projects.

If, for example, you are required to develop a project of 500 FP. Using the median PDRs shown in Figure 3, the number of effort hours needed are:

- In-house: $500 * 13.2 = 6750$ effort hours
- Outsourced: $500 * 10.5 = 5250$ effort hours

Delivery Speed

In the next table, the differences in Delivery Speed, between In-House and Outsourced projects are shown.

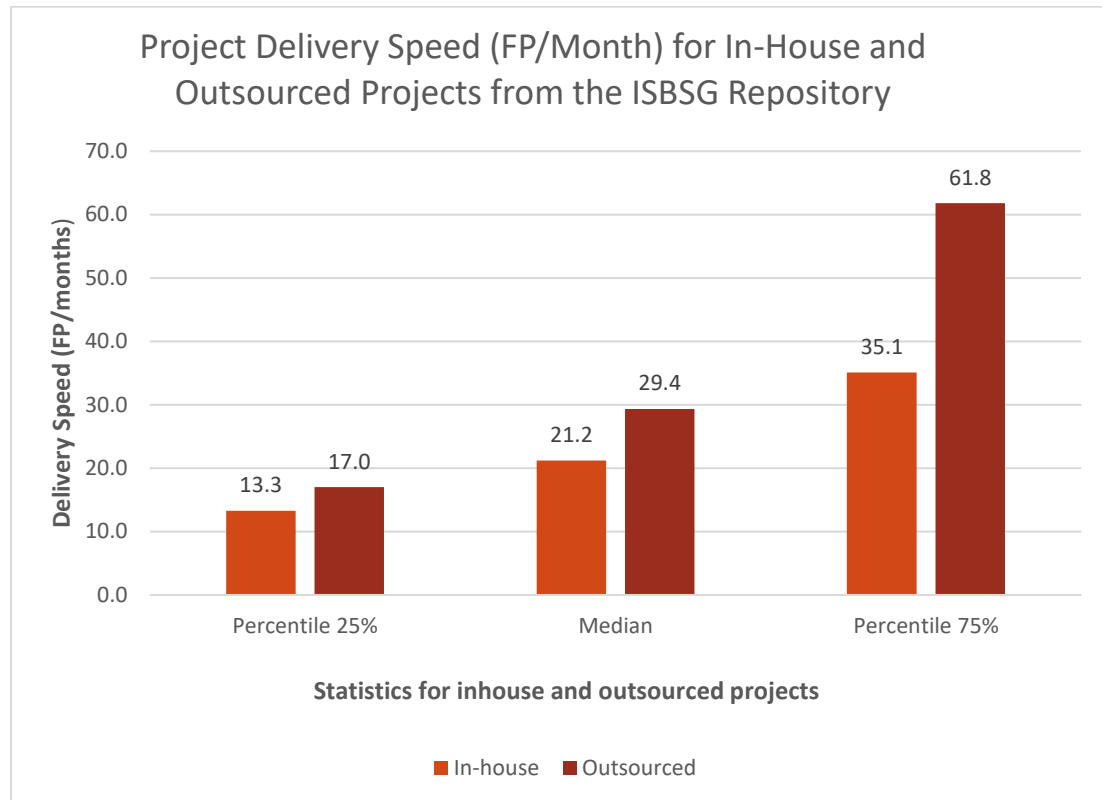


Figure 4: The P25, median and P75 Delivery Speed of the inhouse and outsourced projects

Figure 4 shows that outsourced projects are delivered faster than in-house projects. The median Delivery Speed of in-house developments is 21.2 function points per month. The median Delivery Speed of the outsourced projects is 29.4 function points per month.

Conclusion

While it's tempting to definitively conclude that outsourcing is superior to in-house development based solely on productivity and delivery speed metrics, caution is necessary. Drawing such a broad conclusion from limited information could be misleading because of the following:

Oversimplification:

Attributing success solely to outsourcing ignores potential confounding factors, such as:

- **Project type:** Different projects have varying complexities and suit different development approaches. Outsourcing might prove efficient for specific project types but not others.
- **Team expertise:** Even in-house teams can achieve high productivity if they possess the necessary skills and experience.
- **Management practices:** Effective project management, regardless of development model, plays a crucial role in success.

Alternative perspectives:

Consider different viewpoints:

- **Long-term value:** While outsourcing delivers faster results, consider the long-term value of building internal expertise through in-house development.
- **Strategic alignment:** In-house teams might better understand and align with the company's long-term strategic goals.

Therefore, rather than a definitive conclusion, it's crucial to:

- **Analyze the specific context:** Consider project type, team expertise, budget, desired level of control, and long-term goals.
- **Weigh the trade-offs:** Evaluate the benefits and drawbacks of both in-house and outsourced development considering your specific needs.
- **Avoid generalizations:** Recognize that the optimal approach depends on your unique situation, and there's no one-size-fits-all solution.

By carefully considering these factors, you can make an informed decision based on your specific circumstances, ensuring the chosen development model best aligns with your project's needs and your company's goals.

If you wish to do your own analysis, or if you are interested in using 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/data-subscription-2/

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>

Partners

This page will help you to find an ISBSG partner in your country:

<http://isbsg.org/board/>