

ISBSG PDQ TOOL User Guide

Improving the management of IT resources by both business and government

ISBSG

PRODUCTIVITY DATA QUERY (PDQ) TOOL

USER GUIDE

www.isbsg.org



ISBSG
Delivering IT Confidence

ISBSG PDQ TOOL User Guide

Introduction

ISBSG maintains a repository of data for Development and Enhancement projects. This data originates from metrics and IT organisations from around the world. It covers all phases of the System Life Cycle undertaken by the Development Team, from Functional Requirements through to Implementation.

The *ISBSG Productivity Data Query* is an interactive tool. It makes use of project data from the ISBSG Development and Enhancement Repository.

The Tool enables users to specify the attributes of their project, then it finds similar projects from the Repository. Project estimates are then quickly calculated on these matches. These estimates can then be used as a benchmark for the user's project.

The estimates generated by the tool are:

Project Delivery Rate

Project Duration

Speed of Delivery

Defect Density

Software Project Effort

Go to [Appendix B – Glossary of Terms](#) for definitions of the terminology used in this document.

Note: Only those ISBSG projects that satisfy the following criteria are used by the *ISBSG Productivity Data Query*:

- ❖ A or B data quality rating – projects with the highest data integrity
- ❖ Functional size expressed in IFPUG 4+, NESMA or FiSMA (development only) Function Points
- ❖ Effort recorded at the core development team level (level 1)

ISBSG PDQ TOOL User Guide

How to Access the ISBSG Productivity Data Query Tool

The steps required to access the Productivity Data Query) are described below:

1. Go to the ISBSG website – www.isbsg.org
2. Click on the **Subscribers Login** link shown on the top right hand corner of any ISBSG web page. Type in your Userid and password. Press Enter.
3. Click on the coloured box – *ISBSG Productivity Data Query Tool* - to display the tool's web page.

How to Use the ISBSG Productivity Data Query

When you have successfully accessed the Productivity Data Query web page, the 3 steps below explain how to generate estimates for your project.

Step 1:

FILTERS			
Functional Size (function points)	Development type	Year	Count Standard
Match all ▾	Match All ▾	Match All ▾	FP ▾

The aim of this step is to filter the available projects from the ISBSG Repository to best match your project. Refer to the [Filter Glossary](#) for a description of the available filters:

- ❖ *Functional Size range*
- ❖ *Development type*
- ❖ *Year*
- ❖ *Count Standard*

ISBSG PDQ TOOL User Guide

Click on the drop-down box for each filter to choose values that most closely match your project. If you do not want to specify a value, *Match All* is the default.

Note: These filters were chosen because analysis by ISBSG has shown that they can have considerable impact on project delivery rate and speed of delivery

Step 2:

Project attributes		Project Delivery Rate				Speed of delivery				Defect Density			
		Matches	1st Quartile	Median	3rd Quartile	Matches	1st Quartile	Median	3rd Quartile	Matches	1st Quartile	Median	3rd Quartile
Primary programming language	<input type="text" value=""/>												
Organisation Type	<input type="text" value=""/>												
Application Type	<input type="text" value=""/>												
Maximum team size	<input type="text" value=""/>												
Web Development	<input type="text" value=""/>												
Intended Market	<input type="text" value=""/>												
Count Approach	FISMA <input type="text" value=""/>												
Development Platform	<input type="text" value=""/>												
<input type="button" value="Perform Query"/>													

ISBSG PDQ TOOL User Guide

[Choose Project Attributes](#)

In Step 1, you filtered the projects from the ISBSG Repository to obtain a sample that best matched your project. The PDQ Tool will use this sample when you choose attributes that best describe your project from the Project Attributes list, in Step2.

See [Attribute Glossary](#) for definitions of the following attributes:

- ❖ *Primary programming language*
- ❖ *Organisation type*
- ❖ *Application type*
- ❖ *Maximum team size*
- ❖ *Web development*
- ❖ *Intended Market*
- ❖ *Count Approach*
- ❖ *Development Platform*

[Understanding Attribute Estimates](#)

Estimates are generated for **each** attribute that is specified. So, for example, if you specified values for Application Type and Count Approach. Separate estimates are calculated and displayed for each. This allows you to compare the effect an attribute has on your project estimates.

The estimates calculated for each attribute are: **Project Delivery Rate, Speed of Delivery** and **Defect Density**. The statistics displayed for each of these estimate are:

- ❖ number of projects that matched the attribute
- ❖ 1st quartile (25th percentile) value
- ❖ Median value
- ❖ 3rd quartile (75th percentile) value

Refer to

ISBSG PDQ TOOL User Guide

Appendix C – Definitions of Statistical Terms for descriptions of the statistics used above.

Notes

- Click **Match All** in the options box for any attribute, then click on the Perform Query button to find the number of projects that have a value for that attribute.
- **Caution:** It is important to carefully consider the “Number of matches” found for each project attribute. The statistics generated for a small number of matches will not be as accurate as for a larger number.

Step 3:

Functional size (function points)	<input type="text" value="0"/>	Estimate		
Estimates	Project Delivery Rate	Project Work Effort	Speed of Delivery	Project Duration
	Matched		Matched	
Level 1 Dev Team	(hours per function point)	(Hours)	Function points per month	(months)
1st Quartile				
Median				
3rd Quartile				

Generate Estimates

In Step 2, estimates were displayed for individual attributes. However, in Step 3, estimates are calculated for those projects that satisfy **all** filters from Step 1 **and all** attributes from Step 2.

Type in the Functional Size of your project and click on the *Estimate* button. The following project estimates are displayed:

- Overall estimate for **Project Delivery Rate** for the matching projects from the Repository
- Overall estimate for **Speed of Delivery** for the matching projects from the Repository

ISBSG PDQ TOOL User Guide

- **Effort** estimate for [your project](#) calculated as follows:
$$\text{Effort (hours)} = \text{Functional Size of your project} * \text{Project Delivery Rate}$$
- **Project Duration** estimate for [your project](#) calculated as follows:
$$\text{Project Duration (months)} = \text{Functional Size of your project} \div \text{Speed of Delivery}$$

Notes

- If the estimates calculated all equal **0** (zero), too many filters and attributes may have been chosen. Or perhaps you chose attributes with small numbers of projects. Try selecting again and take note of the numbers of projects that satisfy each attribute. If small numbers of projects satisfy each attribute, a smaller number will satisfy **all** (ie. Estimates satisfy filters AND attribute1 AND attribute2 AND attribute3 etc..).
- The effort and duration estimates address the full software development life cycle (*ie planning, specification, design, building, testing and implementation*).
- The effort estimate covers the effort associated with the *Core software development team (ie project team, project management and project administration)*. It does not include the additional effort associated with the: *Development team support, Computer operations support or End-users or clients*.
- It is imperative to note, however, estimation process that this is an informal procedure. It **does not** utilise stepwise regression analysis when determining the influence of each individual project attribute on the estimates.
- You should not attempt to use the Productivity Data Query data for any other purpose as this is a special data subset extracted specifically for this tool.

Appendix A - Application Rating

Rating A: The data provided was assessed as being sound with nothing being identified that might affect its integrity

Rating B: Whilst assessed as being sound, there are some factors that could affect the credibility of the data provided

Rating C: Due to significant data not being provided, it was not possible to assess the integrity of the data.

Rating D: Due to one factor or a combination of factors, little credibility should be given to the data provided.

Appendix B – Glossary of Terms

Estimate Glossary

Defect

A fault or error that can cause an application to fail or to produce incorrect results. Three categories of defects are:

Minor Defect - Does not make the application unusable in any way.

Major Defect - Causes part of the application to become unusable.

Extreme Defect - A failure that causes the application to become totally unusable.

Defect Density

Measures the number of Defects detected in the first month of use of the software. It is expressed as Defects per 1000 Functional Size Units.

Level 1 - Development Team

Those responsible for the delivery of the application being developed. The team or organisation that specifies, designs and/or builds the software. It typically also performs testing and implementation activities. It comprises: Project Team, Project Management and Project Administration. It also includes members of IT Operations specifically allocated to the project.

Project Delivery Rate (PDR)

Measures the rate at which a project delivers software functionality to the end user. It is the hours of Effort expended per Function Point.

ISBSG PDQ TOOL User Guide

Project Duration

The duration is the length of time (hours) taken across all phases of the project's development or enhancement. It is the elapsed time of the project and includes inactive time. It has not been standardised to include consistent project phases (e.g. Functional requirements to Implementation). 34 % of the projects have not specified the phases included. Of the remaining, 50% of the projects include from Specification to Implementation. To analyse this further would require looking at individual projects.

Software Project Effort

This is the Effort spent by all teams across all phases of the project's Life Cycle. Project management is included in the effort of each phase.

Speed of Delivery

The rate at which the project team delivers software over a period of time. It is defined as:

$$\text{Speed of Delivery} = \frac{\text{Software Functional Size}}{\text{Project Elapsed Time (months)}}$$

It is expressed as Functional Size per elapsed month.

Filter Glossary

Count Standard

The available sizing methods that can be used for the project:

- Cosmic* - Cosmic functional sizing
- FP* - Functional sizing method (ie.FiSMA, IFPUG 4+ or Nesma)
- LOC* - The number of lines of software source code

Development Type

The options are:

- New Development* - A project that delivers new functionality to the business or is a complete replacement of an existing system.
- Enhancement - Changes made to an existing application where new functionality is added or existing functionality is modified.
- Re-development - The re-development of an existing application.

Functional Size

This is the functional size of the software. It can only be used when Count Standard is set to FP or Cosmic.

Year

The year that the project was implemented. Options are last 3 years, 5 years or 10 years.

ISBSG PDQ TOOL User Guide

Attribute Glossary

Application type

A classification of the application that the project is used for.

Count Approach

The method used to functionally size project (ie. IFPUG 4+, Nesma, FiSMA). The function point count approaches for Nesma and IFPUG 4+ are almost identical.

Intended Market

This describes the relationship between the project's end users and development team. The options are:

- In-house – Project team and users are in same organisation
- Outsourced - Project team and users are in different organisation

Maximum team size

The maximum number of people during each component of the work breakdown who are simultaneously assigned to work full-time on the project for at least one elapsed month.

Organisation Type

A standard classification for the business within which the organisation operates. Note: The organisation is that for which the project has been developed.

Primary programming language

This is the main programming language used for the project.

Web development

A derived indicator of whether the project data includes any comment that it is a web development.

Appendix C – Definitions of Statistical Terms

Matches represent the number of projects from the Development and Enhancement Repository that are included in a given estimate.

First quartile is also known as the 25th percentile. 25% of values in a sample are less than this value.

ISBSG PDQ TOOL User Guide

Median Value is the middle value in the data sample. When the values in the data are arranged in ascending order, half of the values in the sample are less than the median and half are greater. Using the Median value is more reliable than using the Mean/average which can be distorted by outlier values.

Third quartile is also known as the 75th percentile. 75% of values in a sample are less than this value.

Mean Value is the average of all the values in the data sample. The mean value can be skewed by outlier values, consequently it is safer to use the Median value in most instances.