



Using IFPUG Functional Sizing and Historical Data to Improve Business Success



Mumbai Chapter



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<https://isma13in.wordpress.com>



- ✓ **G1. How to Improve confidence in project estimates**
- ✓ **G2. Measuring Organisational Competitiveness**
- ✓ **G3. How to reduce risk in Fixed Price Contracts**



International Software Benchmarking Standards Group

- “ ISBSG (International Software Benchmarking Standards Group) is a not-for-profit organisation.
- “ The ISBSG was 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.
- “ The ISBSG mission is to help YOU and your organisation improve the planning and management of your IT software projects. To achieve this:
 - “ We have 2 repositories of IT software development / maintenance data. This data originates from trusted, international IT organisations. Our data can be used as a benchmark for your IT project.
 - “ You will find valuable information on a wide variety of topics, in our many reports and books.
- “ The ISBSG mission is supported by our partners, who represent IT and Metrics organisations and associations from around the world.

Explore ISBSG Offerings at www.isbsg.org



Use historical industry data to improve your IT management



Case #1- Reality Checking of Estimates

Context

- “ This approach requires that there is historical project data available for comparison to the estimate being checked.
- “ There are 2 main sources of historical data:
 - “ In house historical data. This is preferable as it reflects all aspects of the development environment
 - “ External industry data such as from ISBSG. This should be used until sufficient in-house data become available.
- “ My key message is that any mature development organisation must implement a measurement and productivity management program incorporating functional sizing.
 - “ Some are concerned about the cost of a measurement program but my experience is that it adds only 1-2% to costs.
 - “ The benefits will far outweigh the cost



Case #1- Reality Checking of Estimates

- “ A telecom company wished to develop a new Java system for the maintenance of subscription types;
- “ A team of experts studied the requirements documents and filled in the WBS-based estimation calculation (bottom-up estimate);
- “ They decide that an estimate of **5,500 hours** should be feasible;
- “ The project manager decided, that in order to have more confidence in the estimate, to perform a “reality check” against historical data



Reality Check of Effort

An estimated FP Count was performed on the Early Requirements Document with the following the expected sizes:

Min: 550 FP, likely 850 FP, Max 1300 FP

Implicit likely expert PDR: $5.500/850 = \mathbf{6,5\ h/FP}$

Selecting the most relevant projects in the ISBSG D&E repository showed the results:

	PDR (h/FP)
Min.	3,2
Percentile 10%	4,3
Percentile 25%	6,2
Median	8,9
Percentile 75%	12,9
Percentile 90%	19,8
Max.	34,2
N	89

Functional Size		
550	850	1300
3.410	5.270	8.060
4.895	7.565	11.570
7.095	10.965	16.770

5.500 hours seems optimistic



Result

Expert estimate was assessed optimistic

“ Adjusted Estimate:

“ Effort: 8.000 hours

“ This turned out to be quite accurate!

“ The project manager now always carries out reality checks and is ‘spreading the word’.

“ To assist in analysis, an on-line Productivity Data Query tool (PDQ) is available via subscription on www.isbsg.org to provide access to more than 7,500 project records in the ISBSG Repository



Case #2 – Measuring Organisation Competitiveness

Senior management of a software company wondered how competitive they were when it comes to **productivity**.

Many bids for projects were lost and they wished to improve, especially their Microsoft.Net department.

Analysis of the bids by department showed the following:

Nr. of bids	23
Average PDR in bid	16,3 h/FP
Average Size (FP)	230 FP
Average teamsize	6 fte

	PDR (h/FP)
Min.	3,2
Percentile 10%	3,8
Percentile 25%	5,9
Median	7,6
Percentile 75%	12,9
Percentile 90%	18,9
Max.	34,2
N	35

ISBSG
data
analysis



Result

- “ This analysis data indicated that the bids were well outside best industry performance – between the 75% and 90% percentiles
- “ This caused a review of the bid phase which showed a number of issues:
 - “ Estimates were **extremely pessimistic** due to severe penalties in case of overruns;
 - “ In a number of stages, risk surcharges were added;
 - “ They wished to work in fixed team of 6 fte, but ISBSG data shows that the project size was usually **too small** for this teams size to be efficient;
- “ As a result the bid process was redesigned, making the company **more successful!**



Supplier Assessment Using Functional Sizing in the Fixed Price RFP Process

The Issue:

- “ Suppliers are often required to submit a fixed price quotation to deliver against a set of high level requirements with limited client or user contact.
- “ As a result they typically have to add a significant risk contingency to cover additional functionality discovered during design, changes during the project and other “unknowns”
- “ The client pays the contingency amount even if the risks do not eventuate.
- “ Pricing of changes is commonly a cause of great argument between the parties



Buying software on a cost per delivered Function Point basis

This methodology was first published as southernSCOPE by the State Government of Victoria, Australia and subsequently adapted and published by FiSMA (Finish Software Metrics Association) as northernSCOPE

Summary of Steps.

- “ Identify the business need
- “ Engage an independent Scope Manager
- “ Develop early estimates of time, cost & duration (using ISBSG data)
- “ Produce Project Scope document
- “ Invite Proposals
- “ Select a developer based on \$ per function point
- “ Produce detailed requirement specification
- “ Complete detailed sizing – Baseline FP Count. Sets Total Price
- “ Changes priced according to agreed \$/FP price
- “ Pay on functionality delivered plus approved changes.



Preliminary FP Scope

- “ The engaged Scope Manager provides an early estimate of the project’s FP Size, based on high level requirements and experience of similar systems.
- “ This will only be approximate and based on many assumptions
- “ This is to allow supplier to bid expected \$/FP for an application of this size



Project Scope Document

- “ High Level Requirements
- “ Estimated FP count
- “ All factors likely to influence \$/FP price
 - “ Project process and deliverables
 - “ Customer context for the project
 - “ Preferred project schedule
 - “ Development language/tools
 - “ Non-functional requirements



Requirements Analysis

- “ Supplier and Customer define and agree detailed functional requirements, in conjunction with Scope Manager
- “ Scope Manager performs Baseline Function Point Count.
- “ BPFC & contracted \$ per FP sets project fixed price
- “ There must be an agreed procedure for pricing change requests



Function Points and Change Pricing

- “ This needs to be agreed upfront. Separate prices for Added/Changed/Deleted Function Points may be set to reflect the impact on the developer. For example:

	<u>% of FP Price</u>
Added	120%
Changed	150%
Deleted	50%

- “ A more sophisticated regime can also be used where price depends on what lifecycle phase the project is currently in.



Benefits of Software Acquisition using \$/FP

- “ No lose/lose fixed price contracts
- “ Flexibility for customers to request needed change
- “ Supplier paid for work done on direction of customer
- “ Customer pays for functionality they need
- “ Increased customer and supplier satisfaction
- “ Project is baselined at completion of requirements, at points of change, and again at project end.
- “ “Lessons-learned” data collected in experience database

