



Resources For Implementing A Metrics Program

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INFRASTRUCTURE AND RESOURCES REQUIRED TO SUPPORT A FUNCTION POINT BASED METRICS PROGRAM

1	INTRODUCTION	3
2	ROLES AND RESPONSIBILITIES	3
2.1.1	<i>IT Management</i>	4
2.1.2	<i>Business End Users (Clients)</i>	4
2.1.3	<i>Project Managers</i>	4
2.1.4	<i>Design Team</i>	4
2.1.5	<i>Function Point Team</i>	5
3	CRITERIA FOR SELECTING SOFTWARE TO COUNT	5
3.1	PROJECT ACTIVITIES WHICH DO NOT DELIVER FUNCTION POINTS	6
4	STANDARDS FOR RECORDING FUNCTION POINT COUNTS	7
4.1	BACKGROUND	7
4.1.1	<i>Reference Documentation</i>	7
4.1.2	<i>Count Reports</i>	7
5	STANDARDS FOR RESOLVING COUNT ISSUES	7
6	STANDARDS FOR REVIEWING COUNTS	8
7	RESOURCES AND COST TO IMPLEMENT COUNTING	9
7.1	FUNCTION POINT INFRASTRUCTURE.....	9
7.2	COST OF IMPLEMENTING FUNCTION POINT COUNTING INFRASTRUCTURE.....	10

INFRASTRUCTURE AND RESOURCES REQUIRED TO SUPPORT A FUNCTION POINT BASED METRICS PROGRAM

1 Introduction

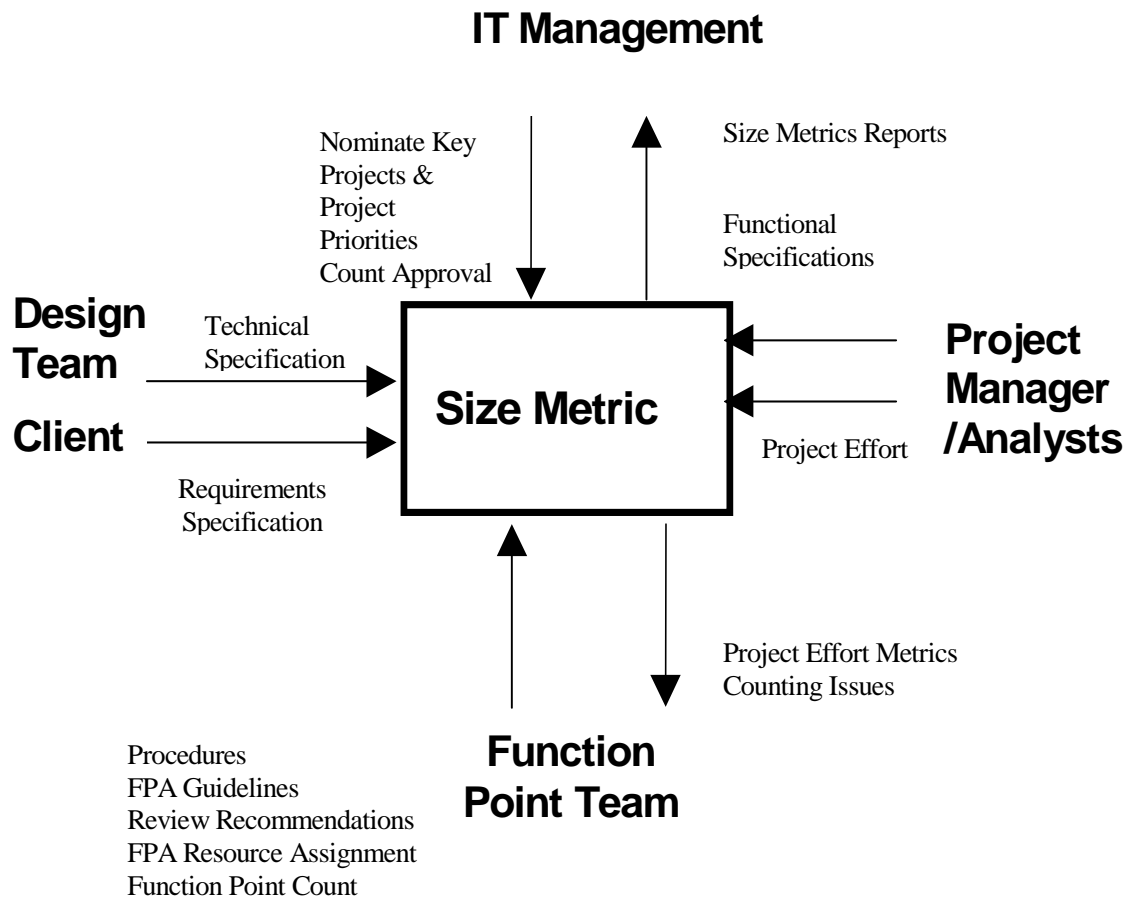
The paper Uses and Benefits of Function Point Analysis ¹we identified ways in which Function Point Analysis can be used within an organisation to better manage and control the software production process. Many of the metrics derived contributed to management decisions, which would have a direct influence on the financial bottom line of the organisation, or contribute to ensuring the organisation meets its contractual obligations. It is therefore of utmost importance that function point measurement be carried out accurately and repeatably so as to optimise the correct interpretation and application of the result.

In order to ensure accurate function point results, the measurement process itself needs to be predictable, repeatable and auditable. This section identifies the major aspects of a function point program that need to be established if the program is to be useful and sustainable.

2 ROLES AND RESPONSIBILITIES

Organisations need to establish clearly the roles and responsibilities of all the key participants in the function point counting process. The following diagram defines the functional size metrics process and its key interfaces within an organisation.

¹ Refer – “Uses and Benefits of Function Point Analysis – Pam Morris Copyright Total Metrics



2.1.1 IT Management

The IT Management should:

- nominate criteria for projects to be selected for sizing
- nominate key size metrics for regular reporting for their departmental area
- use size metrics in the development and review of their process improvement strategies
- gain a high level understanding of the basic principles of FPA.

2.1.2 Business End Users (Clients)

The Clients should supply:

- the signed-off the Requirements Specification documents
- application knowledge of functional user requirements.

2.1.3 Project Managers

The Project Managers should supply:

- Appropriate documentation, such as the Functional Specifications, at appropriate project milestones in order for the Function Point count to proceed.

2.1.4 Design Team

The Design Team should supply:

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- Technical Specification documentation at appropriate project milestones in order for the Function Point count to proceed.

2.1.5 Function Point Team

The Function Point Team, which may be made up of one or more counters should:

- perform function point counting at scheduled project milestones
- become proficient in the use of the FPA recording and reporting tools
- act as administrator for the database where function point counts are stored
- perform function point counting according to the procedures described in their FPA procedures manual
- produce the required FPA reports and participate in FPA count reviews
- keep informed of any changes in FPA techniques, rules or principles via IFPUG website
- communicate any changes in FPA counting rules, guidelines or procedures to others in the Function Point team
- develop procedures, guidelines and standards for the collection, recording and reporting of FPA data
- provide expertise to resolve function point counting issues
- verify counts are being performed as prescribed and sign-off counts when a milestone is completed.

Depending upon the magnitude of the metrics program and direction provided by management, the Function Point Team may also be required to:

- assess function point counting personnel for accreditation as an approved *Function Point Counter* for the organisation
- advise development area managers on the role of functional size in reporting Key Performance Indicators
- communicate the basic principles, uses and benefits of FPA to clients and management
- advise their IT personnel and clients on the correct use of FPA within their organisation
- provide ongoing assistance to project teams in the support and implementation of the procedures within this manual
- analyse FPA count results for specific projects and across projects
- use FPA count results to develop specified management reports.

3 CRITERIA FOR SELECTING SOFTWARE TO COUNT

Organisations need to establish their *purpose for sizing* the software and how the results will be used prior to commencing the function point counting activity. The *purpose* influences:

- the *strategy* for counting i.e. the accuracy of the count results, the level of detail the count is to be documented.
- the *scope* of the counting exercise i.e. which applications and projects to include, and
- the *positioning of application boundaries* i.e. decide whether to segregate applications or combine applications based the organisations metrics needs.

Some organisations select to only count selected software based on predefined selection criteria. Examples of such criteria are that they only count:

- *projects* that:
 - have a high risk of failure
 - are over a pre-defined budget limit
 - are to be included in a productivity repository for benchmarking
 - represent a particular development environment
 - are over 50 function points.

- *applications* that:
 - represent a particular development platform
 - are completely developed inhouse and not based on third party software,
 - are not planned to be decommissioned within the next 12 months
 - are active and have significant and regular enhancement activity.

Organisations also need to decide at what stages of a project's lifecycle projects need to be counted. Again this will depend on the *purpose* for counting. If the *purpose* is to establish productivity delivery rates then a count at project implementation will be sufficient. However if the *purpose* is to develop estimates and track project scope creep then detailed well-documented counts performed at pre-defined milestones are more appropriate.

Typical project milestones at which counts need to be performed are:

- Requirements Specification
- End of design
- Implementation

3.1 Project Activities which do not Deliver Function Points

It is important to distinguish between enhancement projects (which deliver function points) and other 'project' activities that may occur within the production environment for an application which do not deliver function points. When collecting effort for a project it is important to make this distinction so that only effort for the function point generating activities is included in the productivity rate calculations.

The following activities are identified as examples of project work, which typically *cannot* be assessed using function point analysis:

- Application maintenance and support including:
 - production support (problem determination), fixes and repair
 - table updates
 - perfective maintenance (rust proofing)
 - corrective maintenance
 - decommissioning
 - production control
 - system response time improvements
 - application security/access control
- consulting and ad-hoc support for clients
- project deployment and implementation
- Major data conversion and database loading. (Note: the functionality developed to perform the conversion is assessed using function point analysis; however the actual

conversion activity is not. The effort involved in the conversion task is dependent upon the number of records converted, which is independent of the count.)

- Cross-project impact analysis.

4 Standards for Recording Function Point Counts

4.1 Background

In order to ensure that the counts performed within an organisation are able to be:

- easily checked for completeness
- easily maintained for future enhancements
- easily audited

they need to be documented in a prescribed standardised way.

A fully documented count should include details of the following:

4.1.1 Reference Documentation

Counters should maintain a list of all system documentation referenced during the count.

To ensure tracability details should include:

- Document Name
- Document ID - (e.g. file name)
- Version Number
- Date - Most recent date on which the document was created or amended.

4.1.2 Count Reports

The following topics should be covered in the Count Documentation:

- Count Description including
 - any high level assumptions,
 - purpose for counting
 - names of counters and applications experts participating in the count
 - version number of the IFPUG counting rules and any local counting rules applied
 - date of the count and status of the project or application at the time of counting
- Function Point Summary Calculations
- Value Adjustment Factor with ratings for individual General System Characteristics
- Transaction and File List with associated type, complexity and function points awarded
- List of assumptions and decisions made during the count, cross-referenced to relevant function
- Application boundary diagram

5 STANDARDS FOR RESOLVING COUNT ISSUES

The IFPUG Counting Practices Manual (IFPUG CPM) defines the rules and guidelines for counting function points. This manual should be the first reference used in resolving

counting issues. However situations frequently arise in specific software environments which are not specifically addressed by the IFPUG manual. IFPUG do provide a ²service by which count issues are resolved by the Counting Practices committee. However in difficult scenarios, these decisions may require time to resolve and will not be answered until the next release of the IFPUG CPM, in these cases the counter has to make their own decision.

Counters need to consider all the principles embodied in the IFPUG CPM and interpret them for their own unique situation. However, experience has shown that different counters may arrive at different resolutions based on their own unique interpretation of the text. It is therefore recommended that organisations implement processes that promote consistent counting. This would include:

- Providing function point experts to act as mentor(s) who provide consistent advice to novice counters
- Using a consistent method or course of training in FPA
- Establishing a repository for counting issues and their agreed resolutions. This needs to be regularly maintained and updated once agreement of a resolution is reached. It needs to be readily accessible to all counters
- Establishing a method of interfacing with other counters from other external organisations to ensure that internally developed approaches are in alignment with industry practice
- Establishing a method by which IFPUG count resolutions published on the WWW site are internally available to counters
- Providing regular workshops to train counters in counting some of the more difficult scenarios
- Ensuring counters have access to ³public forums on function point counting issues

6 STANDARDS FOR REVIEWING COUNTS

Count review procedures need to be implemented in order to check the count results of novice counters to ensure that their counting practices conform to the organisations counting standards and procedures and their count results are:

- accurate
- complete
- internally and externally consistent.

The recommended approach to conducting count reviews should be one of:

- constructive criticism with a view to providing transfer of skills to the counter,
- accurate reporting of the outcome so as to provide feedback into the organisations counting standards and training regime and
- ensuring that recommendations for corrections to the counts are implemented.

² Refer IFPUG WWW site : www.ifpug.org/ifpug

³ A function point related LISTSERV has been running since 1994. It is managed by the Canadian Metrics User group (CIM), based in Montreal, Quebec, Canada. Each mail item (in this case messages about function Points) sent to the mailing list is re-routed through the mailing list to all addresses of subscribers to the mailing list: To join this group send an email to : CIM@CRIM.CA - SUBJECT: "none" <this field must be empty> CONTENT: SUB FUNCTION.POINT.LIST "your name"

Recommendations are made for any changes to the count where necessary. Any problems found should be discussed at the time with the person responsible for the count and where possible, solutions agreed upon and recorded.

It is recommended that organisations:

- formally train their reviewers in the FPA review methodology
- have documented standards and procedures for reviews and the process with dealing with their outcomes
- teach aspects of the review process as part of the basic FPA training.

The review process should involve the counter who is interviewed by the reviewer. The counter is required to demonstrate that all functionality within the scope of the count has been correctly identified.

Particular attention should be paid when reviewing Enhancement counts to ensure that all functionality specified in the change request and were impacted by project activities were considered in the count.

Where a function point count does not pass the review process, a date for a subsequent review should be agreed between the reviewer and the Function Point Coordinator.

7 RESOURCES AND COST TO IMPLEMENT COUNTING

7.1 Function Point Infrastructure

The following resources are identified as being essential to the implementation of a successful function point counting program.

- ◆ **Function point count personnel** (one person may hold more than one role)
 - function point counters who have been formally trained,
 - co-ordinator of function point counting activity,
 - mentor to support novice counters,
 - experienced counters to review counts,
 - business users trained with a high level understanding of function points
- ◆ **Function Point Counting Reference Material**
 - IFPUG Counting Practices Manual
 - Access to Internet function point listserve and IFPUG WWW site
 - Metrics related reference books and Journals
- ◆ **Function Point Counting Procedures**
 - *Local Counting procedures* which identify the organisations rules for documenting counts, criteria for selecting counts, roles and responsibilities for recording, storing and reporting count results.
 - *Local Counting Issues and Resolutions* which identify the agreed resolutions to counting issues specific to the organisations environment.
 - *FPA Review Procedures* which identify the activities and procedures used in the count review and templates for reporting and acting on review results
- ◆ **Function Point Counting Tools**
 - Software which enables recording, reporting and update of function point counts
 - Software or methodology to manage configuration control of counts

◆ Function Point Counting Training Program

- Formal training⁴ program that ensures that counters are trained in the basic principles of function point counting for all types of application and project counts. Course material should include practical case studies on which students have an opportunity to practice the theory. Recommended duration of at least 2 days.
- Regular advanced workshops to ensure counters are up to date on how to count new environments and difficult count scenarios

◆ Function Point Counting Industry Liaison

- Access to external industry metrics experts for adhoc advice
- Membership of your⁵ local metrics association and IFPUG
- Attendance at Industry metrics related seminars, workshops and conferences
- Networking with other organisations implementing metrics

7.2 Cost of Implementing Function Point Counting Infrastructure

The cost of developing or acquiring the above resource infrastructure is very much dependent on the scope of your measurement program. The level of detail and extent of implementation of each resource will vary depending on the number of applications and/or projects to be counted and the number of personnel allocated.

However, *all* of the above need to be implemented to some degree in order to ensure that counts are performed in a rigorous, accurate and consistent manner and results can be used reliably to support management decisions.

Many organisations will attempt to minimise costs by using inexperienced staff and not providing them with the resources necessary to implement a robust counting environment. This approach almost certainly guarantees failure. Industry⁶ figures show that 80% of measurement programs fail; one of the main reasons is lack of management commitment to providing adequate budget and staffing resources.

The cost of failure of cancelling a program is not only the wasted resources expended but also a longer-term negative impact on staff perception of the effectiveness of function point counting. Staff who have participated in counts will view the exercise as a waste of their time and strongly reject future moves to re-implement another function point counting program.

It is critical to get it right the first time. If resources are limited then reduce the scope of the counting exercise to only include projects and applications that satisfy strict criteria. Limit the number of counters to only one or two so as to reduce the overhead in training and documenting of procedures. As the effectiveness of function point counting is demonstrated then grow the infrastructure as more resources are allocated to the program.

⁴ Preferably an IFPUG certified training course.

⁵ Many countries have their own local metrics associations which formally liaise with IFPUG and can provide access to metrics resources. Contact details are available from the IFPUG WWW site.

⁶ Howard Rubens 1996

Remember an organisation is better off not implementing function point measurement at all than implementing it poorly and basing important business decisions on erroneous data.