Considerations for Counting with Multiple Media

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The MMTF has come to a common understanding as outlined in this paper that the IFPUG method provides the flexibility such that both approaches are acceptable when evaluated in context for a specific situation. Stating one approach is always right and the other always wrong without any context reduces the meaningful applicability of the IFPUG method.

The scope, objectives and perspectives for the sizing context must be considered in conjunction with the single and multiple approaches in multiple media scenarios.

This document is based on the function point counting practices as described in the current 4.3.1 series of the IFPUG Counting Practices Manual (CPM) and demonstrates the applicability of IFPUG Function Points in multiple media contexts.

Additional examples will be solicited from our membership, using both approaches to help provide guidance, especially for inexperienced function point analysts.

International Function Point Users Group (IFPUG)

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Introduction

Background

Application of the functional sizing rules of the IFPUG Counting Practices Manual by Certified Function Point Specialists has led to two alternative approaches being used when sizing projects and applications where the same functionality is delivered in more than one medium.

One approach takes the viewpoint that the medium for delivery for a transaction function should not be considered as a differentiating characteristic when identifying unique functions. Two functions delivering the same functionality whose only difference is the medium for delivery are considered to be the same function for the purpose of counting. In this document, this approach is referred to as the "single instance" approach.

The other approach considers the medium for delivery as a potential differentiating characteristic when identifying unique transaction functions. Unique functions are recognized in the context of the medium in which they are required to operate. In this document, this approach is referred to as the "multiple instance" approach. This approach can also include careful consideration regarding the scope, objectives and boundaries for the analysis so that functions are included and excluded appropriately for the specific analysis.

This subject is also largely a user/ business uniqueness perspective. The user-business community defines the "what" and the technical community defines the "how". Guidelines and frameworks from a user perspective relating to uniqueness will also provide additional guidance for the functional analysts.

This difference in the application of the rules will have the following impacts:

- It is likely that current industry and in-house productivity benchmarks and estimation tools contain size data using a combination of both approaches.

  Any data collection and / or data analysis techniques for these benchmarks and tools should seek to distinguish between the two approaches to avoid the potential of mixing counts from both approaches. When count results are mixed, there is a potential for providing misleading benchmarks.

  Further, if only one of the approaches is utilized within the data and that approach is not clearly stated, those who use the other approach would likely have misleading results when performing benchmarking or estimation for projects which deliver the same functionality on multiple media. ISBSG, for example, does not currently identify the approach for multiple media as one of the project characteristics.

Please note additional information should be collected to provide additional and applicable measures and context.

- Strategic Service Level Agreements (SLAs) and other contractual agreements have been established using each approach. A clear statement should be included in the contractual agreements regarding which approach is intended to be the basis for the agreement.

The purpose of this document is:

- To describe the two approaches currently being used by Certified Function Point Specialists when identifying unique functions in projects and applications where the same functionality is delivered on multiple media.
- To summarize the impact of these two approaches on current important business uses for function point size.
- To list some factors to consider when selecting the approach when sizing multiple media within a function point count.
- To provide a small set of examples to illustrate both approaches where multiple media delivery impacts the identification of unique transaction functions.

Multiple Media Considerations for Counting

The functional sizing rules seek to provide a consistent framework, or frame of reference, for collecting valuable and meaningful size data from which analysis can be performed to satisfy the needs of multiple stakeholders. The impact of objectives of the count and perspectives of the sizing context must be formalized in some way to ensure consistency of counting while providing valuable, usable information relating to functional size.

Where multiple media is utilized in projects or applications, the approach to how multiple media is sized within the count needs to be clearly stated. Further, benchmarking data based on functional size using IFPUG function points should have a clear indication of the multiple media approach as one of the identification criteria, plus applicable additional measures and context. Previously defined contracts should have clarification of the approach utilized to size software where multiple media are used, and new contractual documents should explicitly define the approach to multiple media.

IFPUG recognizes both the single instance and multiple instance approaches for applying the rules defined in the Counting Practices Manual. IFPUG does not endorse one approach as preferred over the other. In most situations, either approach may be applied if the results of the function point count are used in the context of the approach applied. The determination of whether to count single or multiple instances for a project or application should be assessed by the individual function point analyst as it pertains to a particular situation, organization, history of past practices, or objectives.

Some factors to consider when selecting the single instance or multiple instance technique for sizing multiple media include:

- Specific contractual language or Service Level Agreements designating the approach to be used for sizing particular multiple media situations
- Benchmarks based on a particular approach to sizing multiple media situations being used in the organization or company for which the sizing is being performed
- Any estimation tool or estimation techniques in use at the organization
- The objectives for your specific functional analysis
- The context of how function point sizing results will be used and leveraged
- Any scope considerations that might impact analysis of the sizing results.

Important note: We provided descriptions for both approaches in these examples; however, once you have taken the most appropriate approach for your analysis, it must be consistent for future analysis that satisfies your objectives and goals. For example, DO NOT count using "single instance" at requirements, then change to "multiple instance" at implementation. Future estimates will be based upon actual productivity rates achieved in conjunction with scope creep calculated from the requirements functional analysis. The bottom line is that comparative analysis needs to be "apples to apples" in order to perform consistent analysis using consistent, traceable, and auditable data.

Function point analysts are encouraged to submit papers and participate in discussions of how one (or both) approaches(s) would be applied in particular situations, including the considerations used for selecting that approach. This body of knowledge would contribute to the consistent application of each approach, as well as provide guidance for inexperienced function point analysts to leverage.

Contents

Common Terms

The following common terms are used in this document.

Term	Use in Document
Channel	The term channel also refers to media and is a common term used by the business. Multiple channel is essentially multiple media.
Media	The term media describes the way data or information moves in and out of an application – e.g. screen display, printer, file, voice. Used here in the wider sense to include e.g. different technical platforms, file formats, as different media.
Multiple Media	Multiple media is where the same function is delivered over more than one media. Usually only one media is required for any given user at any given time; e.g., account inquiry via Internet as opposed to account inquiry through teller's terminal.
Multi-Media	Multi-media is where more than one media is necessary to deliver a function; e.g., an Internet news item that includes video and text – the complete story can only be fully understood if the video is watched and the text is read.
Single Instance approach	The single instance approach does not recognize the medium for delivery for a Transaction Function as a differentiating characteristic in the identification of unique Transaction Functions. If two functions deliver the same functionality using different media, they are considered to be the same

Term	Use in Document
	function for sizing purposes.
Multiple Instance Approach	The multiple instance approach specifies that functional size is taken in context of the objective of the count, allowing a business function to be recognized in the context of the medium in which it is required to operate. The multiple instance approach recognizes the medium for delivery for a Transaction Function as a differentiating characteristic in the identification of unique Transaction Functions.

Organization of Counting Scenarios

This chapter utilizes various scenarios to illustrate how multiple media is currently counted.

Approach

This chapter uses the following headings in the examples provided as Counting Scenarios.

- ***Description*** – A high level description of the example being discussed.
- ***Scenario*** - The example presented in more detail, using a business context.
- ***Scenario Diagram*** - The example depicted graphically as further explanation, if needed.
- ***Objective of the Count*** – The business purpose of the count.
- ***Scope of the Count*** – The functionality of interest in the count.
- ***Discussion*** – A brief explanation of how each of the single and multiple instance approaches would be applied in counting.

Outline of Scenarios

The following scenarios do not represent a complete list of the multiple media situations and they do not indicate how to count. They are intended to provide an insight into the way practitioners interpret the impact of multiple media when identifying unique functions. Understanding these examples will facilitate the understanding of additional scenarios that may be encountered.

Scenario Number	Scenario	Summary Description
1	Same Data Displayed and Printed	The same information can be displayed on a screen or printed on request from the display screen.
2	Same Data Output as Data in File and Printed Report	An application outputs a file of payment data and prints a report with identical payment information.
3	Same Data Input in Batch and Online	Invoices are added to an application by batch file input or online entry.
4	Same Data Input in Batch and Online, Application Baseline after Online Function Changed	Application has the same functionality for adding an invoice by batch file input or online entry. The online function is changed.
5	Multi-Channel Delivery of Same Functionality	Flight check-in functionality can be performed via counter, web, kiosk and wireless handset.
6	Reports in Multiple Formats	Reports are required in two different formats.

Scenarios

Scenario 1: Same Data Displayed and Printed

Description

An application displays information on the screen. The same information can be printed on request from the display screen.

Scenario

Vendor information is maintained in a vendor data store.

A Vendor is added with the following data: vendor name, the vendor billing address (3 lines), city, state and zip, vendor point of contact, and vendor phone number. The vendor name distinguishes between vendors with more than one location.

Vendor data may be displayed with the same information as identified above. Selection is by vendor. The user can also request to print the same data using a Print Report capability provided by the application.

Objective of the Count

To size the application baseline as part of the assessment of the organization's application portfolio.

To use the function point size of the application to determine support requirements.

Scope of the Count

All application functionality supported in production.

Discussion

The single instance approach considers that identical vendor data is being presented by both the screen display and the printed report and only one function is counted.

The multiple instance approach considers that identical vendor data is being presented using more than one media type and the count will potentially include as many instances of the function as there are media types. In this example, two functions are counted – screen and printer.

When storing the count for the application in the count repository, the approach - single or multiple instance – should be clearly recorded so that the function point size data can be interpreted in a consistent way.

Scenario 2: Same Data Output as Data in File and Printed Report

Description

An application outputs a file of payment data and prints a report with identical payment information.

Scenario

At the close of business, the application outputs a file of all payments received to the banking system. This file contains the payment date, payment amount, PO number, vendor name and the vendor billing street address, city, state and zip. All information is retrieved from the invoice data store and the vendor data store.

A report is printed showing identical payment information.

Objective of the Count

To size the application baseline as part of the assessment of the organization's application portfolio.

To use the function point size of the application to determine support requirements.

Scope of the Count

All application functionality supported in production.

Discussion

The single instance approach considers that identical payment data is being output to both file and printed report, and only one function is included in the count.

The multiple instance approach considers that identical payment data is being output on more than one media type and the count will potentially include as many instances as there are media types. In this example, two functions are counted – file and printer.

When storing the count for the application in the count repository, the approach - single or multiple instance – should be clearly recorded so that the function point size data can be interpreted in a consistent way.

Scenario 3: Same Data Input in Batch and Online

Description

An enhancement project introduces the Add Invoice functionality to the application. Invoices are to be input by either of two methods: batch file input or online entry.

Scenario

The capability of entering invoices is being added to the application. There will be two ways for invoices to be input to the application's data stores.

The business requires the ability for a batch file to be assembled through text edit function with the file format to be a pre-defined structure. The processing of the file performs edit checks and allows valid invoices to be processed into the application.

The business also requires the ability to enter invoices one at a time through an online function. The processing of the online entry involves entering the data into the fields on the screen and then selecting the 'process' button on the screen. The same edit checks as for the batch entry are performed against the data.

Objective of the Count

To use the function point size to determine the effort estimate for the required change to the application.

Scope of the Count

The functions impacted (added) by the project.

Discussion

The single instance approach counts one function of Add Invoice.

In contrast, the multiple instance approach counts two functions – Add Invoice Batch and Add Invoice Online.

When extending the function point size into an effort estimate, care must be taken to use productivity rates or estimation tools which use the same approach to multiple media as that used in the count.

Scenario 4: Same Data Input in Batch and Online, Application Baseline after Online Function Changed

Description

An application has identical functionality for entering invoice data in batch and online. An enhancement project changes the Add Invoice Online functionality to include additional attributes.

Scenario

An application has identical functionality for entering invoice data in batch and online. The Add Invoice Online is now being changed to include additional attributes (the complexity for the function remains the same). The batch function remains unchanged.

Objective of the Count

To determine the application baseline after the enhancement.

Scope of the Count

The functions in the project impacting the changed application baseline.

Discussion

Before the change, the single instance method included a single function in the application baseline of Add Invoice. After the change, the single instance approach recognizes that the Add Invoice Online now has different attributes to the batch function and adds one additional function to the application baseline.

The multiple instance approach does not identify any additional functions and the size of the application baseline after the enhancement remains the same. Before and after the change the multiple instance approach considers the “Add Invoice Online” and the “Add Invoice Batch” as 2 transactions.

Scenario 5: Multi-Channel Delivery of Same Functionality

Description

A project is initiated to build functionality to check-in for a flight. Check-in functionality is to be made available on multiple channels – counter, web, kiosk and wireless handset.

Scenario

The airline has 4 channels available for flight check-in: counter (3270 screen), web, kiosk and by a wireless handset (e.g., smartphone). As a general requirement, the business wishes to offer the same "check-in" functionality on all 4 channels. This general requirement includes the functions – Find Reservation, View Available Seats, Select Seat, and Print Boarding Pass.

At a more detailed requirement level, however, it is expected that all functions are not required for all channels. For example, Printing a Boarding Pass from the smartphone is not yet feasible.

Objective of the Count

To clarify the scope of the project by communicating to the stakeholders the functionality to be delivered.

To confirm which functions are required by channel type so that the size by channel type can be used in negotiations.

Scope of the Count

The scope includes all functionality to be developed for all channel types.

Discussion

The single instance approach includes four functions – Find Reservation, View Available Seats, Select Seat, and Print Boarding Pass.

The multiple instance approach includes potentially 16 functions (4 functions * 4 channel types). The actual number of functions needs to be in accordance with the stakeholders' business requirements.

When communicating sizing results with stakeholders, it must be clearly stated which multiple media approach was used in the sizing.

Scenario 6: Reports in Multiple Formats

Description

An Enhancement project will deliver new reports where each report is required in two different formats.

Multiple delivery methods will be investigated and estimates for each delivery method are required in order to decide on the best business strategy.

Scenario

This project adds a number of new reports to an existing application.

For each report, there is a single specification. However, each report is to be delivered in an html and in a comma separated values format.

Two different delivery methods are being considered:

1. Use of a 3GL to develop each report. This approach is in line with the other reports produced by this application. This approach will result in a separate code base for each report file type, as html or comma separated values.

2. Use of a Report Generator. The Report Generator available generates a print preview and from this print preview, the report can be saved in a number of formats including html and comma separated values. This approach results in a single source code set for each report which extracts and formats the required data. The specific formatting required for the file type, as html or comma separated values, is provided by the Report Generator.

Objective of the Count

To input the Function Point Size into cost estimates for each method in order to find the most effective development strategy from a cost viewpoint.

Scope of the Count

The functionality to be built for each proposed delivery strategy.

Discussion

The single instance approach will include only one instance of each report, irrespective of delivery method.

For the first delivery method, the multiple instance approach counts as many instances as there are media types involved. In this case there are two output types – html and comma separated values file formats. For estimation purposes, the first delivery strategy will include estimates for the construction of each media type.

For the second delivery method, the multiple instance approach counts one output, as only one function needs to be built.

Care must be taken to call upon estimation data, which matches the multiple media approach used.

Summary

Throughout this document, the scenarios have focused on identifying functions in various situations using either the single instance approach or multiple instance approach, while not endorsing one approach over the other. It is left to the function point analyst to utilize and document appropriately the approach to be used for a particular situation.

The approach taken in a particular situation should be documented to provide repeatability and consistency across function point analysts in a particular context.

This chapter does not illustrate all possible implementations of applying the counting rules to multiple media situations. It does, however, provide enough examples that a function point analyst can apply either the single instance approach or multiple instance approach to a given situation.

Additional contributions using both approaches will be encouraged to provide further discussion and consideration.