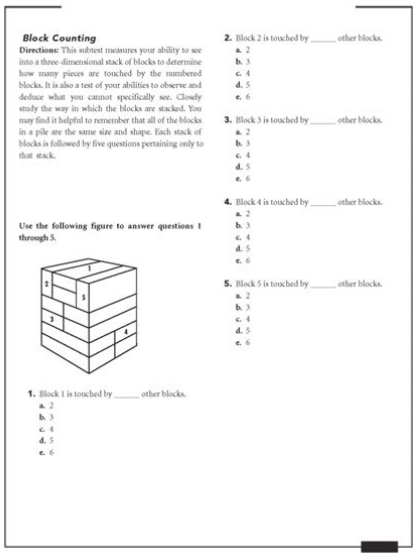
Counting practices manual pdf



Block Counting

Directions: This subtest measures your ability to see into a three-dimensional stack of blocks to determine how many pieces are touched by the numbered blocks. It is also a test of your abilities to observe and deduce what you cannot specifically see. Closely study the way in which the blocks are stacked. You may find it helpful to remember that all of the blocks in a pile are the same size and shape. Each stack of blocks is followed by five questions pertaining only to that stack.

Use the following figure to answer questions 1 through 5.

1. Block 1 is touched by _____ other blocks.
   a. 2
   b. 3
   c. 4
   d. 5
   e. 6

2. Block 2 is touched by _____ other blocks.
   a. 2
   b. 3
   c. 4
   d. 5
   e. 6

3. Block 3 is touched by _____ other blocks.
   a. 2
   b. 3
   c. 4
   d. 5
   e. 6

4. Block 4 is touched by _____ other blocks.
   a. 2
   b. 3
   c. 4
   d. 5
   e. 6

5. Block 5 is touched by _____ other blocks.
   a. 2
   b. 3
   c. 4
   d. 5
   e. 6

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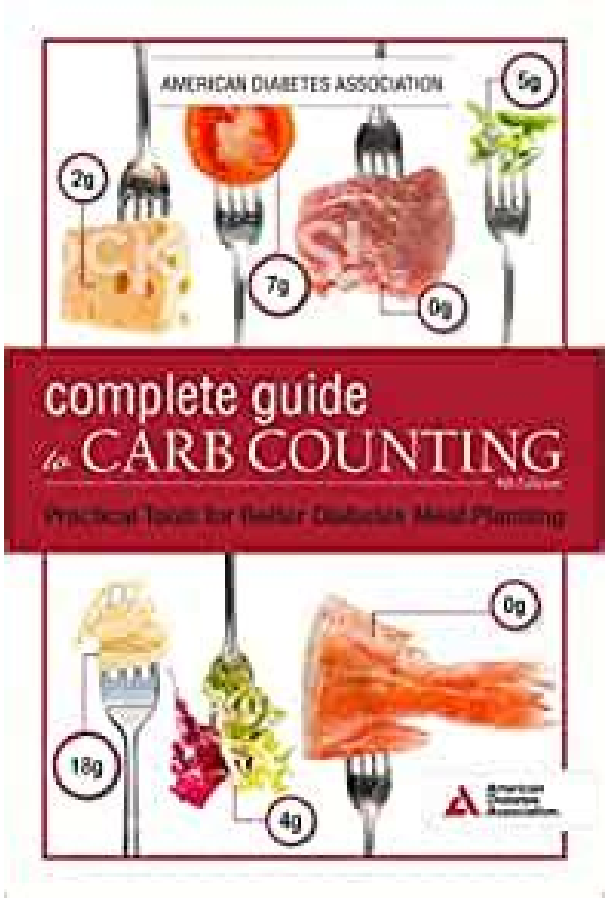

For the latter group the Nesma standard is a valuable addition to the IFPUG standard, when the minor differences between the methods are taken into account. These differences are described in a Nesma whitepaper on sizing. The Nesma standard contains many hints, guidelines and examples that are valuable to any function point analyst. The guidelines expect a basic knowledge on functional size measurement, but we have made it a complete set of guidelines in which novice users can find their way. International Function Point Users Group, Members of IFPUG may reproduce portions of this document within their internal counting practices manuals.Changes are made periodically to the information within. Documentation Team Subject Experts and Writers Mary Bradley, Past Chair, CPC, MSB2 Martin D Souza, Holistic Software Metrics Peter Fagg, Pentad Ltd. E. Jay Fischer, JRF Consulting, Inc. Dave Garmus, David Consulting Group Jim Glorie, David Consulting Group Steve Hone, Software Productivity Research, Inc. Valerie Marthaler, EDS Pam Morris, Total Metrics Bruce Paynter, BNB Software Quality Management Koni Thompson, Quality Consulting Adri Timp, Interpay Nederland Eddy van Vliet, Chameleon Solutions Terry Vogt, Custom Metrics Consulting, Inc. For information about additional copies of this manual, contact IFPUG 191 Clarksville Road Princeton Junction, NJ U.S.A. 609 Web A2 Value Adjustment Factor Calculation. A3 iv Function Point Counting Practices Manual January 1999 B2 Major Functional Change Areas in CPM B2 Version Control. B3 Overview of Changes. B3 Background. B7 The Impact Study. B7 Conversion from CPM 4.0 to B8 Impact on 4.0 Users Changing to B9 Recommendations. B9 Readers Request Form Index Glossary January 1999 Function Point Counting Practices Manual v Although function points originated as a sizing mechanism for software projects, the power and utility of function points have expanded into new uses far beyond that basic

purpose.http://enviomundial.com/userfiles/fisher-v100-control-valve-manual.xml

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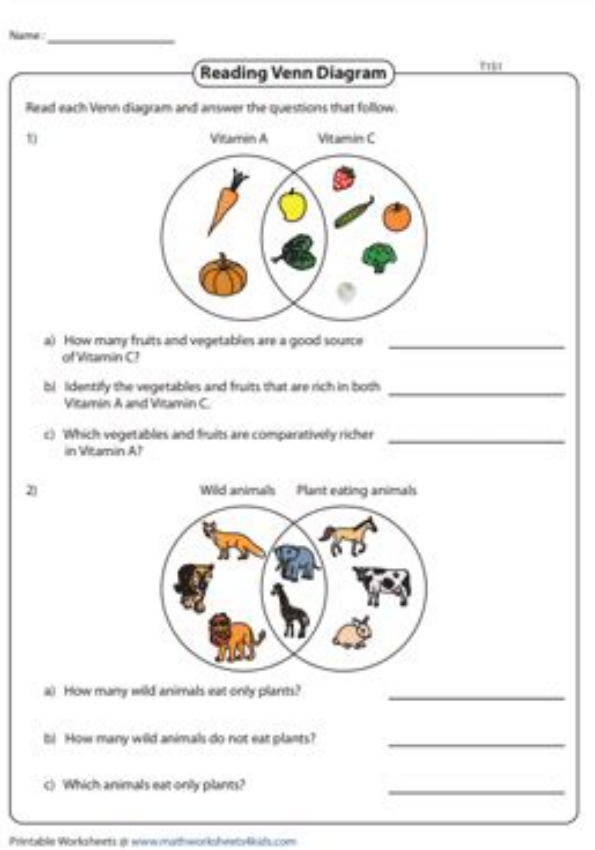
Name : _____

Reading Venn Diagram

Read each Venn diagram and answer the questions that follow.

1) Vitamin A Vitamin C

a) How many fruits and vegetables are a good source of Vitamin C? _____

b) Identify the vegetables and fruits that are rich in both Vitamin A and Vitamin C. _____

c) Which vegetables and fruits are comparatively richer in Vitamin A? _____

2) Wild animals Plant eating animals

a) How many wild animals eat only plants? _____

b) How many wild animals do not eat plants? _____

c) Which animals eat only plants? _____

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As the twentyfirst century approaches, function points are now being applied to all of these tasks Benchmark studies Development cost estimating Litigation involving software contracts Litigation involving software taxation Maintenance cost estimating Outsource contracts Process improvement analysis Quality estimating Quality measurements Sizing all software deliverables documents, source code, test materials Year 2000 software cost estimating As usage of function point metrics expands throughout the software world, more and more companies and government agencies are starting function point programs. This implies that the need for certified function point analysts is rising even faster than the demand for other software professionals. Certification would not be possible without a complete and stable set of counting rules for function point analysis. A great deal of the credit for the rapid expansion of function point metrics should go to the International Function Point Users Group IFPUG and its officers, committees, and members. One of the committees that merits commendation is the Counting Practices Committee. January 1999 Function Point Counting Practices Manual vii If function point counts fluctuated by more than 150% when counted by different individuals as do lines of code counts then function points would have no claim to be considered a useful business metric. But thanks to the work of the Counting Practices Committee, the reliability of function point analysis is good enough to allow function points to serve as the basis for contracts, for carrying out scholarly research, for cost estimating, and for creating reliable benchmarks. So far as can be determined, the accuracy of function points is equal or superior to many other business metrics such as internal rate of return, net present value, or return on

investment. The move to version 4.0 of the IFPUG counting practices in January of 1994 was somewhat contentious and controversial.http://tavio.ru/files/fisher-v-300-instruction-manual.xml

This is because the version 4.0 rules had the affect of reducing function point totals for some applications, by fairly significant amounts. The move to the version 4.1 rules should be much smoother and less controversial. The reason that 4.1 was selected rather than 5.0 as the name of this release is because the numeric results of the new version are close enough to the version 4.0 rules that recounting will not be necessary. The major changes in the version 4.1 rules are in the examples, the clarification of some complex counting situations, and improvements in the overall exposition of function point counting principles. Those learning to use function points should find the version 4.1 rules to be easier to understand and apply than the prior versions. As software itself expands and changes, the rules for counting function points must also be expanded. When Allan Albrecht first introduced function points in October of 1979, many of the kinds of software projects being created in 1999 did not exist. For example, in 1979 software such as multitier clientserver applications, web applets, and massive enterprise resource planning ERP systems were still in the future. It is a tribute to Allan Albrecht s vision that function point metrics are as useful today as they were in But without the work of the IFPUG organization and the Counting Practices Committee, function point metrics would not be expanding in utility at the beginning of the twentyfirst century. In fact, function points are now used for more business purposes than any other metric in the history of software. T. Capers Jones Chief Scientist Artemis Management Systems viii Function Point Counting Practices Manual January 1999. In the late 1970s, Allan Albrecht of IBM defined the concepts that enabled measuring the output of software development projects.

This broadening of the application tested the original description of the measure and made it necessary to create guidelines to interpret the original rules in new environments. This was reflected in Release 2.0 April 1988 of the International Function Point Users Group IFPUG Function Point Counting Practices Manual. Release 3.0 April 1990 of the IFPUG Function Point Counting Practices Manual was a major milestone in the evolution of functional size measurement. For the first time, the IFPUG Counting Practices Committee made an effort to change the document from a collection of many interpretations of the rules to a truly coherent document that represented a consensus view of the rules of function point counting. In this sense, it was the first step to truly establishing standards for function point measurement which could be applied across organizations. April 2000 Function Point Counting Practices Manual ix This release reflected the use of function points early in project development to estimate project size using information engineering disciplines. The rapidly increasing number of graphical user interface GUI windows applications mandated that we include GUI counting in the release. Because more counting was occurring across a wider variety of situations, the release placed an emphasis on interpreting and practicing using the

counting rules. Examples were included throughout the documentation and case studies supplemented the material. Finally, release 4.0 continued to clarify and increase the consistency of function point counting. Release 4.1 Release 4.1 January 1999 provides clarifications to existing rules, new or amended rules which address previously undocumented situations and new hints and examples to aid understanding. The IFPUG Counting Practices Committee has reviewed and processed requests from members, following the Manual Revision Process contained in Chapter 1 of this manual. The revisions included in 4.

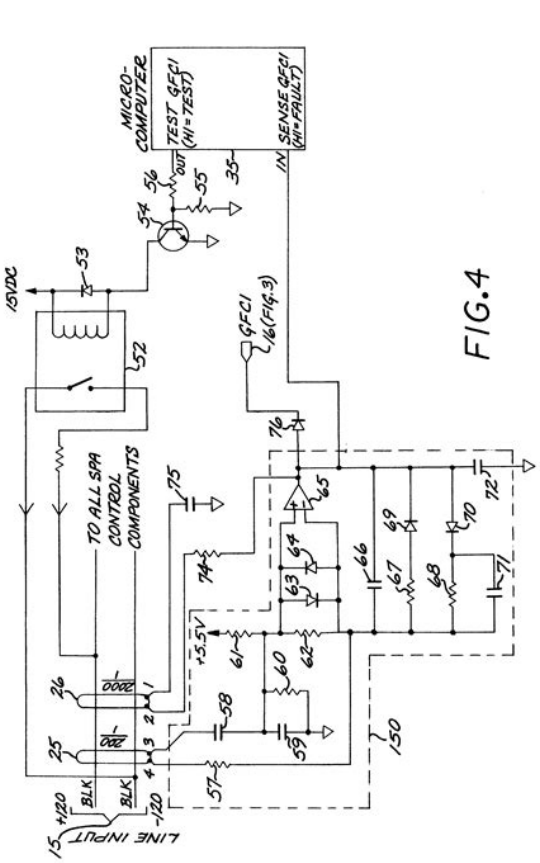

FIG.4

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1 clarify the identification of a user, an elementary process, and control information the differentiation between External Outputs EOs and External Inquiries EQs the identification of Data Element Types DETs and Record Element Types RETs for data functions the identification of Data Element Types DETs for transactional functions Release 4.1 continues the process of clarifying and improving the consistency of function point counting. Finally, with the exception of the 14 General Systems Characteristics, it was designed to be compliant with existing ISO standards if and when any compliance guide becomes a standard.We must recognize how to count new environments as they are introduced. We need to be able to do this in the context of maintaining the validity of the counts we have already made. This will not be an easy task, yet it is an essential one if we are to be able to measure the progress we are making in delivering value to the users and to the organizations they represent. The Counting Practices Committee wishes to thank all those who have helped us in our research and in the production of this manual. Valerie Marthaler Chairperson, Counting Practices Committee April 2000 Function Point Counting Practices Manual xi It also describes publications that are related to this manual. This chapter includes the following sections Topic See Page Objectives of the Counting Practices Manual 12 Guidelines for Release Intended Audience 12 Organization of the Counting Practices Manual 13 Preface and Introduction 13 Overview of Function

Point Analysis 13 Explanation of the Counting Practices 14 Manual Revision Process 15 Frequency of Changes 15 Change Process 15 Related IFPUG Documentation 18 Training Requirements 110 January 1999 Function Point Counting Practices Manual 11. With its release, this manual should be considered the IFPUG standard for function point counting. It is imperative that each IFPUG member takes an active role to ensure counting consistency.

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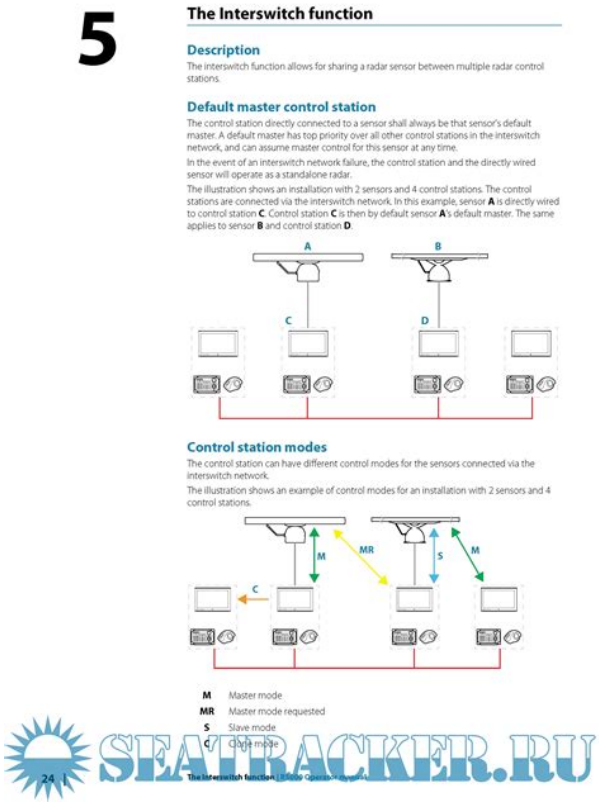
5

The Interswitch function

Description

The interswitch function allows for sharing a radar sensor between multiple radar control stations.

Default master control station

The control station directly connected to a sensor shall always be that sensor's default master. A default master has top priority over all other control stations in the interswitch network, and can assume master control for this sensor at any time.

In the event of an interswitch network failure, the control station and the directly wired sensor will operate as a standalone radar.

The illustration shows an installation with 2 sensors and 4 control stations. The control stations are connected via the interswitch network. In this example, sensor **A** is directly wired to control station **C**. Control station **C** is then by default sensor **A**'s default master. The same applies to sensor **B** and control station **D**.

Control station modes

The control station can have different control modes for the sensors connected via the interswitch network.

The illustration shows an example of control modes for an installation with 2 sensors and 4 control stations.

M Master mode
MR Master mode requested
S Slave mode
C Client mode

IFPUG member adherence to this standard will contribute greatly to counting consistency. Intended Audience The standards in this manual should be applied by anyone using function point analysis for software measurement. The manual was designed for use by persons new to function point counting as well as those with intermediate and advanced experience. 12 Function Point Counting Practices Manual January 1999 Detailed examples conclude chapters 6 and 7. Note A separate IFPUG Glossary includes definitions of terms used across IFPUG publications. Preface and Introduction The Preface and Introduction provide an overview of the manual and function point counting. Overview of Function Point Analysis The Overview introduces the function point counting procedures and includes a summary example of the procedures. January 1999 Function Point Counting Practices Manual 13 22 Organization of the Counting Practices Manual Introduction Explanation of the Counting Practices Chapter 3 explains the concept of user view. Chapters 4 through 9 present details about each of the procedure steps introduced in the Overview. For example, Chapter 4, Determine Type of Count, is the first step in the function point counting procedure. Chapter 9, Calculate Adjusted Function Point Count, is the last step. Information within chapters 5 through 7 is presented in the following sequence Definitions Rules Procedures Counting Hints Examples 14 Function Point Counting Practices Manual January 1999 23 Introduction Manual Revision Process Manual Revision Process This section explains the frequency of changes to the Counting Practices Manual and defines the change process. Frequency of Changes During January of each year, a new version of the Counting Practices Manual may become effective. It will include any new or changed

definitions, rules, or counting practices that have been finalized by the Counting Practices Committee CPC since the previous January.

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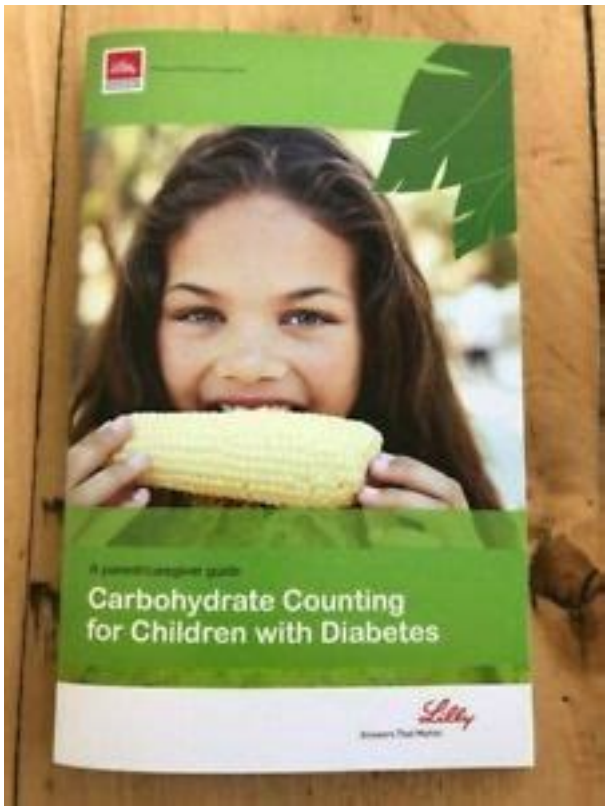

Change Process The following activities outline the process for adding or changing information in the Counting Practices Manual. Explanations of each activity follow the table. Step Action 1 The issue is submitted to the CPC. 2 The issue is assigned for research. 3 The CPC reviews and discusses the issue. 4 The CPC presents a proposed solution to the IFPUG membership. 5 An impact study is initiated if the proposed change would have any impact on existing counts. 6 The final decision is made. 7 The IFPUG membership is informed of the decision. 8 Changes become effective with, and are reflected in, the next release of the Counting Practices Manual. Issue Submitted The reader submits ideas, changes, or issues to the Counting Practices Committee using the Readers Request Form at the end of this manual. If the page is not available, send comments to the address in the front of the manual and mark it, ATTN Counting Practices Committee. January 1999 Function Point Counting Practices Manual 15 24 Manual Revision Process Introduction Research Assigned CPC Review Solution Proposed Impact Study Initiated Final Decision Made Decision Communicated A member of the CPC is assigned the responsibility for identifying all alternatives, the rationale, and the potential impact of each alternative if it is implemented. Thorough examination of existing counting standards and historical papers is completed while compiling alternatives. In addition, an effort is made to determine what is thought to be common practice. The CPC reviews and discusses the rationale for each alternative, and its potential impact. The review and discussion may result in a proposal for change or the review may lead the committee to reject the change request. A proposed solution is made to the IFPUG membership and written comments are solicited. A copy of the proposed changes is mailed to IFPUG contacts at member organizations. The proposal also may be announced and distributed during an IFPUG conference.

The latter depends on the timing of the committee meeting rather than the conference schedule. The

CPC has adopted a conservative stance on initiating impact studies. If it is possible that common practice must change, or several organizations or types of applications will be impacted by the change, an impact study is initiated. The success of the impact study is the responsibility of every IFPUG member. If the CPC receives written feedback indicating there is little or no impact, the study is discontinued. The committee makes a final decision using results from research, written comments from members, and the impact study. The committee can complete more than one iteration of Steps 2 through 5 research through impact study before making a final decision. The final decision can result in a change or the committee may decide that a change is not warranted. The final decision is communicated in writing to IFPUG members via the IFPUG contact at the various organizations. If any impact study results contributed to making a decision, the results and a recommendation on how to minimize the impact of the change will also be communicated. 16 Function Point Counting Practices Manual January 1999 25 Introduction Manual Revision Process Decision Effective Date The Counting Practices Manual is updated to reflect the decisions. The effective date of the decisions is the date of the next January release of the manual. January 1999 Function Point Counting Practices Manual 17 26 Related IFPUG Documentation Introduction Related IFPUG Documentation This Counting Practices Manual is one module in the IFPUG documentation. All documents complement each other. The following table describes the other publications.

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Document IFPUG Brochure Available IFPUG Organizational Structure and Services Available Guidelines for Software Measurement Release Date April 1994 Application of Measurement Information Current release is available as Function Points as an Asset Update Release September 1994 Quick Reference Counting Guide Release Date January 1999 Function Point Analysis Case Studies Release Dates Case Study 1 May 1994 Case Study 2 September 1994 Case Study 3 September 1996 Case Study 4 September 1998 Description This publication is an introduction to the International Function Point Users Group. It includes a brief history of the organization, introduces function point analysis, and defines the purpose of IFPUG. The brochure also includes a membership application. Audience This publication is for anyone who wants an overview of IFPUG or an application for membership. This publication describes IFPUG services, and lists the board of directors, committees, and affiliate members worldwide. Audience This publication is for anyone who wants background information about IFPUG. This manual provides an overview of software metrics for organizations working to create or improve software measurement programs. The manual addresses both system and customer management, provides highlevel justifications for software measurement, and examines the components of effective measurement programs. Audience This manual is intended for IFPUG members, Function Point Coordinators, persons who prepare the reports to management, and other persons knowledgeable about and working directly with function points. This manual explains how function points are an asset and provides information to assist in implementing the use of function points. Audience This manual is intended for IFPUG members, Function Point Coordinators, persons who prepare the reports to management, and other persons knowledgeable about and working directly with function points.

www.drpaullampl.com/userfiles/files/carryall-2-manual.pdf

This quick reference guide is a summary of function point counting rules and procedures. Audience This summary information is intended for anyone applying function point analysis. The case studies illustrate the major counting techniques that comprise the Function Point Counting Practices Manual. The cases illustrate function point counts for a sample application. The cases include the counting that occurs at the end of the analysis phase of software development and after system construction. Audience The case studies are intended for persons new to function point analysis as

well as those with intermediate and advanced experience. 18 Function Point Counting Practices Manual January 1999 27 Introduction Related IFPUG Documentation Document IFPUG Glossary Available with CPM and Function Points as an Asset Description This is a comprehensive glossary that defines terms used across IFPUG publications. Audience The glossary is recommended for anyone who receives any of the other IFPUG documents or anyone who needs definitions of IFPUG terms. January 1999 Function Point Counting Practices Manual 19 28 Training Requirements Introduction Training Requirements Usability evaluations of this publication have verified that reading the Counting Practices Manual alone is not sufficient training to apply function point counting at the optimum level. Training is recommended, particularly for those new to function point counting. Note For function point training, be sure you are trained using IFPUG certified materials. Call the IFPUG Executive Office at for a list of instructors with certified training courses. In addition to the function point specific information, this manual includes the use of structured analysis and design terms, such as business systems and entity. The glossary includes definitions of these terms, but the Counting Practices Manual does not include detailed explanations of structured analysis and design techniques.

Therefore, all of the material will not apply or be helpful if you have not been trained in structured analysis and design techniques Function Point Counting Practices Manual January 1999 29 2 Overview of Function Point Analysis Introduction Contents This chapter presents an overview of the function point counting process. It includes the objectives of function point counting and presents a summary and example of the function point counting procedures. This chapter includes the following sections Topic See Page Objectives and Benefits of Function Point Analysis 22 Objectives of Function Point Analysis 22 Benefits of Function Point Analysis 22 Function Point Counting Procedure 23 Procedure Diagram 23 Procedure by Chapter 23 Summary Counting Example 24 Summary Diagram 24 Determine the Type of Function Point Count 25 Identify the Counting Scope and Application Boundary 25 Determine the Unadjusted Function Point Count 26 Determine the Value Adjustment Factor 29 Calculate the Adjusted Function Point Count 29 January 1999 Function Point Counting Practices Manual 21 30 Objectives and Benefits of Function Point Analysis Overview of Function Point Analysis Objectives and Benefits of Function Point Analysis Function point analysis is a standard method for measuring software development from the users point of view. Objectives of Function Point Analysis Function point analysis measures software by quantifying the functionality the software provides to the user based primarily on logical design.

With this in mind, the objectives of function point analysis are to Measure functionality that the user requests and receives Measure software development and maintenance independently of technology used for implementation In addition to meeting the above objectives, the process of counting function points should be Simple enough to minimize the overhead of the measurement process A consistent measure among various projects and organizations Benefits of Function Point Analysis Organizations can apply function point analysis as A tool to determine the size of a purchased application package by counting all the functions included in the package A tool to help users determine the benefit of an application package to their organization by counting functions that specifically match their requirements A tool to measure the units of a software product to support quality and productivity analysis A vehicle to estimate cost and resources required for software development and maintenance A normalization factor for software comparison Refer to other IFPUG documents such as Function Points as an Asset for additional information about the benefits of function point analysis, or see the IFPUG web site at for additional information. 22 Function Point Counting Practices Manual January 1999 31 Overview of Function Point Analysis Function Point Counting Procedure Function Point Counting Procedure Procedure Diagram This section presents the highlevel procedure for function point counting. Determine Type of Count Identify Counting Scope and Application Boundary Count Data Functions Count Transactional Functions Determine Unadjusted Function Point Count Determine Value Adjustment Factor Calculate Adjusted Function

Point Count Procedure by Chapter The following table shows the function point counting procedures as they are explained in the remaining chapters of the manual. Note A summary example of the counting procedures is presented on the following pages in this chapter.

Chapter Procedure 4 Determine the type of function point count. 5 Identify the counting scope and application boundary. 6 Count the data functions to determine their contribution to the unadjusted function point count. 7 Count the transactional functions to determine their contribution to the unadjusted function point count. 8 Determine the value adjustment factor. 9 Calculate the adjusted function point count. January 1999 Function Point Counting Practices Manual 23 32 Summary Counting Example Overview of Function Point Analysis Summary Counting Example Summary Diagram This section presents a summary example of the function point counting procedure and the components that comprise the count. The following diagram shows the components for the example function point count for a Human Resources Application. Refer to the diagram while reading the remaining paragraphs in this chapter. Function point counts can be associated with either projects or applications. There are three types of function point counts Development project function point count Enhancement project function point count Application function point count The example on page 24 is for a project function point count, which will also evolve into an application function point count. Chapter 4 includes detailed definitions of each type of function point count. Chapter 9, the last chapter in this manual, explains the formulas to calculate the adjusted function point count for each of the three types of counts. Identify the Counting Scope and Application Boundary The counting scope defines the functionality that will be included in a particular function point count. The application boundary indicates the border between the software being measured and the user. The example on page 24 shows the application boundary between the Human Resources Application being measured and the external Currency Application. It also shows the application boundary between the Human Resources Application and the user.

Chapter 5 explains counting scope and application boundary. January 1999 Function Point Counting Practices Manual 25 34 Summary Counting Example Overview of Function Point Analysis Determine the Unadjusted Function Point Count The unadjusted function point count UFPC reflects the specific countable functionality provided to the user by the project or application. The applications specific user functionality is evaluated in terms of what is delivered by the application, not how it is delivered. Only userrequested and defined components are counted. The unadjusted function point count has two function types data and transactional. These function types are further defined as shown in the following diagram. Unadjusted Function Point Count Data Functions Transactional Functions Internal Logical Files External Interface Files External Inputs External Outputs External Inquiries 26 Function Point Counting Practices Manual January 1999 35 Overview of Function Point Analysis Summary Counting Example Count Data Functions Data functions represent the functionality provided to the user to meet internal and external data requirements. Data functions are either internal logical files or external interface files. An internal logical file ILF is a user identifiable group of logically related data or control information maintained within the boundary of the application. The primary intent of an ILF is to hold data maintained through one or more elementary processes of the application being counted. The example on page 24 shows a group of related employee data maintained within the Human Resources Application. An external interface file EIF is a user identifiable group of logically related data or control information referenced by the application, but maintained within the boundary of another application. The primary intent of an EIF is to hold data referenced through one or more elementary processes within the boundary of the application counted.

This means an EIF counted for an application must be in an ILF in another application. The example on page 24 shows conversion rate information maintained by the Currency Application and referenced by the Human Resources Application. Chapter 6 explains the data functions. January

1999 Function Point Counting Practices Manual 27 36 Summary Counting Example Overview of Function Point Analysis Count Transactional Functions Transactional functions represent the functionality provided to the user to process data. Transactional functions are either external inputs, external outputs, or external inquiries. An external input EI is an elementary process that processes data or control information that comes from outside the application s boundary. The example on page 24 shows the process of entering employee information into the Human Resources Application. An external output EO is an elementary process that sends data or control information outside the application s boundary. The primary intent of an external output is to present information to a user through processing logic other than or in addition to the retrieval of data or control information. The processing logic must contain at least one mathematical formula or calculation, or create derived data. The example on page 24 shows the process of producing a report that lists all employees stored in the Human Resources Application. An external inquiry EQ is an elementary process that sends data or control information outside the application boundary. The primary intent of an external inquiry is to present information to a user through the retrieval of data or control information. The processing logic contains no mathematical formula or calculation, and creates no derived data. No ILF is maintained during the processing, nor is the behavior of the system altered.