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USERS GROUP

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MetricViews

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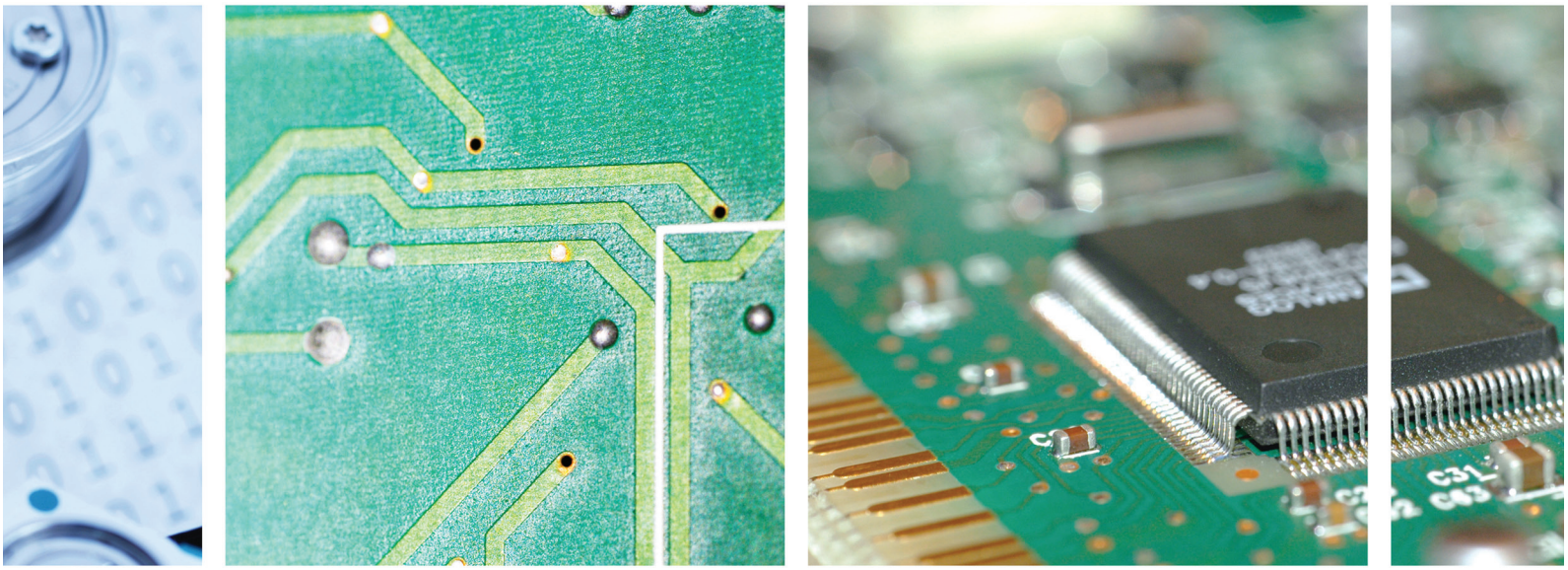
WHERE WE WERE, WHERE WE ARE, WHERE WE'RE GOING.



Inside...

Where we were, where we are, where we're going.

Seems like only yesterday we were trying to work out just how function points should work…..wait, that was yesterday.

Yes, function points – and how to use them - are still a work in progress. However, an enormous amount has been achieved – and learnt – in those thirty years, so we take a moment to ponder them in this issue.

But just a moment.

IFPUG is very much looking forward, as you can really feel if you read the message from our new President below.

And this issue of MetricViews bristles with new ideas. And updates on new initiatives and experiences.

Some experiences with SNAP have been documented – and they do make interesting reading. Certainly interesting enough to make it worth closer investigation.

Some variations on how to use and even think about function points have been aired within. Are they too complex? Are they taking function points too far? Not all uses of function points are for all – but there are many ways of taking advantage of the core knowledge and understanding of size.

One way is to keep it simple – and we talk about that.

We also have some in-depth not-so-simple discussions on some important technical issues related to sizing. And some more on automation – what does automation of sizing really imply?

Thirty years of existence is a small achievement – but 30 years of building a base that can propel software measurement into the next 30 years, that is a large achievement.

Message from the President

Kriste Lawrence

IFPUG - Where We Have Been, Where We Are, and Where We Are Going.

I want to start my first President's Message by thanking some people who are moving on to new positions.

Over the past two years, Joe Schofield has been a fabulous President, leading IFPUG with a strong, steady hand and level head. Joe will continue to serve on the Board as Past President for the next two years and continue to serve IFPUG on the Past Presidents' Council (PPC).

Tom Cagley has been elected Vice President and will serve in that role for the next two years. Most recently, Tom has held the role of Secretary and Director of Communications and Marketing, and is a former IFPUG President. Tom has encouraged us to use the creative commons method of publishing the rules for SNAP which accounted for over two thousand free downloads in the first calendar year. In the future, we hope to have additional publications available with this license.

Lori Holmes has been elected Secretary in addition to her role as Director of Counting Standards. Lori's Counting Standards committee has been extremely busy supporting the membership this year by developing the Certified SNAP Practitioner (CSP) exam, iTips and uTips among other items. Debra Maschino was re-elected to the Treasurer position and is taking a proactive view in growing IFPUG's capital so that we can invest in new products and services.

Mauricio Aguiar is continuing as Director of International & Organizational Affairs. Mauricio was instrumental in the success of the recent ISMA8 in Rio de Janeiro, Brazil. Christine Green continues as the Director of Applied Programs as well as continuing her involvement in additional development of materials related to SNAP.

I would like to warmly welcome Dácil Castelo to the Board position of Director of Communications & Marketing and Luigi Buglione as Director of Education and Conferences. Dácil has been a member of the Membership Committee. Luigi has previously been a member of the Education and Conferences Committee as well as a member of the ITMAC Committee. Both Dácil and Luigi are helping us to grow in Europe through supporting the upcoming ISMA9 Europe conference (coming in March of 2014).

While I have mentioned the 2013-2014 Board, I cannot fail to mention our two Board members who have recently left. Bruce Rogora, who has served as Director of Counting Standards, Vice President, President and Past President, is leaving the Board where he has served since 1997. Bruce's time on the Board follows a long period of volunteering on the Certification Committee. I wish Bruce well on his future endeavors and need to publicly thank him for his service. Steve Woodward has also left the Board and the position of Director of Education and Conferences. Under Steve's leadership, we have held conferences in Richmond, Phoenix, Ottawa and Rio de Janeiro. I would also like to thank Steve for his service on both the Board and the New Environments Committee.

And now, I'd like to talk about the rest of us and our future with IFPUG. IFPUG is driven by all of us - IFPUG members, IFPUG volunteers, IFPUG committee members, IFPUG partners (formerly referred to as vendors), and the IFPUG Board. We are what make it all happen. To show some of what we have done in 2013, here is a partial list of our accomplishments:

- Added many past conference presentations to the Resources section of ISMA Insights for review and use by our members
- Developed several uTips and iTips
- Developed the CSP exam
- Certified more than 20 Certified SNAP Practitioners (CSPs)
- Recognized six (6) individuals as CFPS Fellows (showing a minimum of 20 concurrent years as CFPS)
- Held a CIO Symposium in Ottawa, Canada
- Held ISMA8 in Rio de Janeiro, Brazil
- Held SNAP Train-the-Trainer classes
- Presented several SNAP workshops
- Changed our IFPUG graphic

Where are we going in the future? We are all ultimately involved in IFPUG in order to provide value to our end customers – those who use and find value in Size and other Measurements. Our mission is to be the world-wide leader in software measurement products and services. Our customers depend on IFPUG to create quality products and services. Our customers depend on our certifications. Our customers depend on the results of our counts and measurement for accurate billing and for productivity analysis among other things. Our customers need us to be innovative and creative.

The Board has recently updated a backlog list of ideas and initiatives to take us into the future. We are requesting your help in developing additional ideas and initiatives to add to this backlog list. During my presentation at ISMA8 in Rio, I asked for ideas from the membership. I was handed several ideas that day and have collected a few more since then. For those who were not in the audience that day or did not yet have a chance to respond, please send your ideas to president@ifpug.org. The Board is in the process of adding to the backlog and evaluating the priorities of the items on the list. Your ideas and input will help us make certain that the priorities are aligned with our current and future needs.

In short, WE all need to work together to make IFPUG's future as bright and innovative as it can be. Let's increase our value by providing relevant, industry-shaping products and services to our customers!

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From the Editor's Desk

Paul Radford

Thirty years of IFPUG is definitely a cause for celebration.

Yet it has also been a period of great frustration. The Holy Grail has not yet been grasped. The demand and interest in software measurement is less today than it was 30 years ago.

When I first started in metrics – straight from a Project Management/ Business perspective – I thought that, once we had provided the "perfect" counting tool, the use of metrics and function points would naturally spread across the market place. The capabilities to analyse, forecast and compare were exactly what business and IT management had been requesting for decades. And I had found a thriving international industry organization (IFPUG) and, with it, people with data and experience to share.

All over the world, we found a ready market for the vastly improved estimating concepts that function points could offer. Performance benchmarking followed quickly and successfully. Then we found ourselves doing scope management, asset valuation, dollar per function point calculations and consequent "refereeing" – and then conflict. Long term contracts based on function points have changed the game further, in that consistency and economy have become the driving forces. IFPUG's response to these multiple masters has been to attempt to create one measure for all, and that has manifested itself in a complex suite of too-many rules. In turn, this has often discouraged both those who seek consistent perfection and those who seek a pragmatic and useful measure.

Like most things, this outcome reflects both the strengths and weaknesses of IFPUG and IFPUG function points. An analysis technique, by definition, does not lend itself to easy definition. And whilst the basics of measurement in software, as in many things, can be used for many purposes, one measurement process for all situations is a two edged sword. Attempts to increase consistency in IFPUG rules have sometimes led to a lessening in utility, accuracy and simplicity. We still argue about interpretation of the rules, yet we consistently and successfully settle cost disputes between stakeholders with transparency and fairness.

But success breeds failure, and many of the large and complex metrics programs initiated in those heady early days failed in their grandiose purpose and were ended as expensive and, to a large degree, irrelevant failures. Some fulfilled a temporary purpose; others survive, sometimes with little change, and have provided substantial business benefits over a lengthy and valuable period. New programs with more practical terms of reference arise every day; our success rate is climbing.

Yet many of the questions and most of the answers remain the same. Much of it is about communication with business. For the IT marketplace we have a valuable message, but we have to make people understand its value to them.

And the opportunities still lie in front of us.

Thoughts on Becoming a CFPS Fellow

My CFPS Memories by David Garmus

I remember first using Function Points (FPs) in 1988, while at CACI as the Development Manager, to estimate software projects. I left CACI and joined SPR as a consultant in 1992. I became a member of the Counting Practices Committee in 1990 and was the editor of Versions 3.1 through 3.4 of the Counting Practices Manual. What a difference between 3.4 (with 75 pages) and 4.0 (with 270 pages). We had the first CFPS exam in 1993 at an IFPUG conference; now the exams are available anytime throughout the world. We had major conferences twice a year, then went to one, and now to regional conferences. I was President of IFPUG during 9/11, and our Las Vegas conference attendance suffered significantly due to the fear and uncertainty of flying.

Measurement has changed significantly with first, the addition of the Certified Software Measurement Program (I qualified as a CSMS), and later SNAP (I participated on the SNAP development team). SNAP now has become an outstanding partner with FPs in sizing and estimating projects.

Communication in the world is changing, and IFPUG is keeping up. We first developed a decent website in 2001; now IFPUG has become proficient with the web, e-news, social media, webinars, and telephone conference calls.

Membership initially was predominately U.S based; now membership outside of the U.S has outpaced the U.S. Best of all, the use of FPs has grown. That growth aided consulting companies, including the David Consulting Group, which I founded with David Herron. I thank IFPUG for that opportunity, for the privilege of being named a CFPS Fellow, and for the continued growth in measurement of software development.

My CFPS Memories by Lori Holmes

It is amazing how quickly 20 years has passed. I still remember the first time I took the CFPS exam – I thought I failed. Actually every time I took the exam I thought I failed, but fortunately that was not the case. It was a concern because being a CFPS has been critical to my success as a consultant in software measurement. The designation helped in marketing and provided comfort to clients that they were receiving support from an expert. As time has passed, keeping the certification has been required for my job, but since I needed to retake the exam and/or use the extension program, it enabled me to keep up with the rules and terminology. I hope that going forward, the CFPS designation keeps its distinction as being difficult to obtain. We want the CFPS to mean something in the industry and for those who achieve it to truly demonstrate the skill set. This will keep the value of the designation and of IFPUG.

My CFPS Memories by Carol Dekkers

When the Communications and Marketing Committee (CMC) asked me to write a few words about becoming an IFPUG CFPS fellow, it struck me just how many years I've been associated with function points and held the Certified Function Point Specialist designation – 20 years! I am truly honored to receive the "Fellow" accolade (with the benefit of being a CFPS for life without continued recertification – hurray) , yet there is a bit of melancholy that goes with this award because I have more fond memories looking back at my association and involvement with IFPUG than I anticipate I will have over the next 20 years.

IFPUG is and always has been an incredible volunteer-run user organization with a fluctuating and energetic membership that spans the globe. I remember back in 1994 before I joined the IFPUG Board of Directors, and my committee, the Management Reporting Committee (now defunct) sought to expand our global participation. We proudly became the most international committee with members from U.K., Germany, Canada, Korea, Italy, France and a couple of others. We worked on delivering new ideas about reporting and using FP for managing software development and the diversity of ideas was inspiring (and so much fun!) The "I" in IFPUG is truly one of our strengths, and I have been honored to serve IFPUG as a board member for years, as President/Past President, and as the ISO standards representative. As one of the reviewers/critics of the very first IFPUG CFPS certification exam, I remember wondering about how well the membership and the world would embrace having to certify as a CFPS, but it was the right choice for IFPUG as the future rolled out certification requirements for public tender contracting in several countries, and IFPUG led the way for other functional sizing methods to follow suit. Now, 20+ years later, function points remain the single most consistent means of measuring software product size and is the most reliable basis for software estimating and outsourcing contract measurement.

The significance of Function Points and the trivial (in my humble opinion) discussions emanating internationally about "superior methods" and "which method is best" came to bear a few years ago at a joint Project Management and Construction Cost Engineering conference in Ljubljana, Slovenia. I attended (out of curiosity and interest because my background is mechanical engineering) a session on methods of sizing in construction projects. The participants, all engineers, engaged in a lively debate about how best to size a floor plan. Should it be based on the outside wall distance or inside walls? Should areas that are less cost-centric and easier to build (like living rooms versus kitchens) be sized differently to account for the differences in labor intensity? How should stairs be measured – if it is a 3 story building, should the area be measured once

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and then divided by 2 or 3? The experts argued for an hour (and likely long afterwards) until agreeing to disagree and saying that "It's most important to choose a method and be consistent with it." I had to pinch myself because it certainly sounded like a function point discussion between proponents of various sizing methods (which goes on to this day.) I purport that we should take our lead from the construction industry, work together to support ALL functional size measurement standards that are ISO conformant, select the one that best suits YOUR company and purpose and be consistent. I can envision a world that finally embraces functional sizing (what a concept after 35 years that FP has been on the market!), and estimates projects consistently based on product size rather than labor hours or lines of code anticipated. This will take COOPERATION not only from IFPUG, (which has been more than gregarious in its support in ISO and other arenas of the other sizing methods!) but from the other groups to establish a community that fosters the good things about measurement rather than competing for market share.

It is an honor and a privilege to serve and be a part of IFPUG and the ISO community, and I am thankful for the CFPS because it provides the world with a common denominator and a solid basic starting point for ensuring consistency in software measurement.

Thirty years of worldwide measurement practices strongly influenced by IFPUG represents a great achievement.

Using SNAP for GUI Creation and Enhancement – An Experience

By Abinash Sahoo

I have been practicing Function Point (FP) estimations and several other organizational measurements based on FP for the last five years and one of the constant endeavors of my learning process is to eagerly unlearn what I learned in the past, and welcome better ideas. One such interesting new idea that I learned in the process of SNAP creation was the need to separately measure the size and effort for Graphical User Interface (GUI) development or enhancement.

While conducting a productivity analysis and estimation for an extensively GUI- based application in our organization, we came across a specific challenge related to productivity and estimation accuracy. This article presents the situation and how SNAP helped us overcome those challenges with a similar example. The productivity and cost figures used in the article are just for illustration as I cannot disclose the organization specific confidential data in this forum.

In an enhancement project, our customer asked for a new functionality, 'View Usage Details,' with which the users can select a month and click the button 'View Usage Details' to see the usage details in a screen. The functionality measured 5 FP and the development effort estimated by the team was 90 hours. Thus the productivity of the project came out to be 18 hours/FP.

The project team then brainstormed in order to understand how well FP measurement covered the GUI development aspects. After several rounds of discussions it was concluded that one can still create a correctly working functionality without creating an aesthetically good looking, easily readable and usable screen. For example, the 'View Usage Details' requirement, the project can just fetch the usage details data from the database and show it in a simple screen as shown in Figure 1, which although is not very readable and easy to interpret, it is still functionally correct as it shows the correct data using the appropriate business logic. So to make the output readable and aesthetic, the project needs to develop a screen as shown in Figure 2, and additional effort is required to develop the beautiful screen.

Figure 1

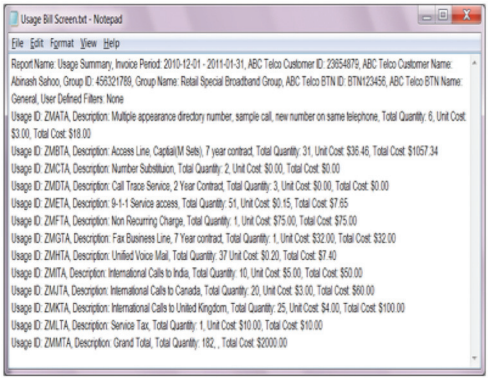
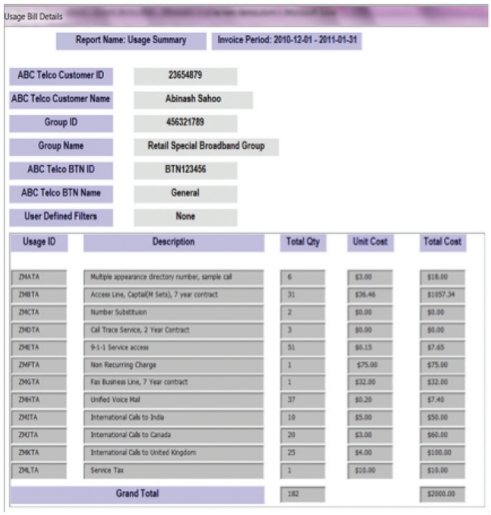


Figure 2



The customer surely wanted a screen as in Figure 2 and not as in Figure 1. But such readability and usability aspects of the functional output are not explicitly tagged as NFRs in the requirements. Referring to ISO/IEEE 25010:2011 quality model, such 'Readability,' 'Usability' aspects can be considered as Non-Functional aspects of software and hence one can surely use SNAP to size and estimate the screen development or enhancement activities.

Without going into much detail of the SNAP calculation, let me present the findings for the project after we implemented SNAP. The SNAP size for 'View Usage Details' screen was found to be 9 snap points (SP). Using a productivity figure of 4 hours/SP the effort to develop the GUI was calculated to be 36 hours. The SNAP productivity baseline was created internally for the organization -organizations are encouraged to create their own productivity baselines.

Considering the fact that before using SNAP, the effort estimated was actually diluted with a certain amount of Non-Functional effort, so it was necessary to segregate the Functional as well as Non-Functional size and effort to get a realistic picture. This means the actual effort to develop only the 'Functional size' would be "Total Effort estimated minus Non-Functional Effort", i.e. 90 – 36 = 54 Hours.

Thus the actual 'Functional Productivity' of the team would be 10.8 Hours/FP (54 hours divided by 5 FP), which is 44% more productive than the earlier calculated productivity value. So the project could demonstrate a higher real productivity which could be used for future estimations for functional requirements. And for such GUI creation or enhancement they could use the SNAP productivity separately to estimate Non Functional effort.

The summary of the experience is given in the table below:

Hourly Rate	$ 80/Hour
SNAP Productivity	4 Hours/SP
Cost of SP	$ 320/SP

	Project using only FP	Project using FP and SNAP
Total Effort Estimated (Hours)	90	90
Total Cost of the enhancement	$ 7200 (= $80 * 90)	$ 7200 (= $80 * 90)
FP Size	5	5
SP Size	NA	9
Cost of NFRs	$ 0	$ 2880 (= $ 320 * 9)
Cost of FRs	$ 7200	$ 4320 (= $ 7200 - $ 2880)
Cost per FP	$ 1440 (= $ 7200/5)	$ 864 (= $4320/5)

Key gains by using SNAP:

Using SNAP along with FP led to a win-win situation for all the stakeholders.

1) Our customer got the detailed insight into what they get in return for what they pay, leading to higher customer satisfaction.
2) Development teams could justify their costs better by measuring all aspects of their software development using FP and SNAP.
3) Project managers could demonstrate a higher real productivity, boosting the morale of the team.

The author works as a Quality Expert in Amdocs and is a core member of the NFSSC. To share your SNAP success stories, write to nfssc@ifpug.org

Reducing the Costs of Benchmarking: Simple Function Points

By Robyn Lawrie, CHARISMATEK Software Metrics

Introduction

The benchmarking of software delivery processes is a standard activity for good governance of ICT. For this, an organisation may make use of external benchmarking specialists, benchmark in-house or take a hybrid approach. However it is done, there is usually a significant cost associated with the benchmarking.

A key contributor to the cost is the activity of measuring the output produced by the software delivery processes – the size of the software. The dominant method used for sizing is Functional Sizing and, more specifically, International Function Point Users Group (IFPUG) Function Point Analysis. The IFPUG method has been in use for several decades, and associated benchmarking databases, both public and private, are well established.

The method, however, is somewhat difficult to learn and apply. The complexity of the rules often leads to different interpretations and confusion and means that specialized skills are needed for successful application. All of these issues contribute to the cost of sizing.

Recently, two new but very different initiatives have sought to address some of these difficulties, Automated Function Points and Simple Function Points. There has already been some industry discussion about Automated Function Points but the research which has produced Simple Function Points has flown quietly under the radar.

This research seeks to reduce benchmarking costs by simplifying the IFPUG method for sizing the software product. The outcome of this research is discussed in this article.

Simple Function Points – The Impetus

Why try to simplify the Function Point sizing method?

The use of Function Point Analysis has waxed and waned over the years, for a variety of reasons.

Anecdotally, those organisations who have implemented the method often find it just too hard to build and retain the knowledge needed for the successful implementation of the technique and even where they do, find the cost of sizing more than they wish to spend.

In more formal research, the Forrester Group released a report in 2009 entitled *Function Points: A Critical Analysis of the Pros and Cons of Adoption.* While this report is a few years old now, in my opinion, its content is still true today. One of its findings pointed to the 600 pages of rules for the IFPUG sizing method rules as a significant barrier to take up.

Organisations want easy, fast and agile measurement methods while still achieving reliable results.

There are publicly-available as well as proprietary methods, which have sought to address these issues. An example is the David Consulting Group's FP Lite™ method (see http://www.davidconsultinggroup.com/insights/publications/fp-lite-an-alternative-approach-to-sizing/). Typically, these alternative methods adapt or simplify existing approaches and measure their success by assessing the size produced against the size from the more detailed traditional method.

The research behind Simple Function Points takes a different approach.

Simple Function Points – The Research

Data Processing Organisation (DPO) is a long-time established company in Italy specializing in software measurement and related services and innovative products such as the Early and Quick Function Points for IFPUG Function Point Analysis. Roberto Meli is DPO's CEO.

In late 2010, DPO initiated a research project with the objective of simplifying the sizing process. It specifically sought to:

"Define a new functional measurement consistent with the framework of the ISO 14143 family of standards, totally compatible with the IFPUG (method) when applied on the same object of measurement, but...

1. ***Easier to apply***
2. ***Easier to learn***
3. ***Less susceptible to different interpretations***
4. ***Less susceptible to "manipulation" of measurements***
5. ***Designed to allow an easier update of existing measurement assets***
6. ***Designed to allow an immediate conversion of existing assets counted with the IFUG method"***

The first two points are very important in addressing the issue of cost. Complicated rules take time to learn and are so very easy to misinterpret or to completely forget.

The last point, that of compatibility with the IFPUG method, ensures that existing organisation and industry assets in the form of benchmarking databases are preserved and can continue to be used. An issue with newer sizing methods, function points or otherwise, is that these database assets are essentially lost as there is no compatibility or conversion between sizing methods and collection of benchmark data must start anew.

For those who may not be familiar with the ISO-certified functional size measurement methods, there are two principal steps in the sizing.

- The first step analyses the software product and breaks it down into the functionality delivered. These functions are formally referred to as the Base Functional Components (BFC) and are more or less equivalent to functions as users of the software would see them.

- The second step assigns a weight or score to each function where the score attempts to express the complexity of the function. Both steps are governed by the rules for the specific sizing method. The scores for each function are then totaled to give the overall size.

The starting point in DPO's research was to question whether the second step, that is, assigning the complexity weighting, was actually making the resultant size measure any 'better' for its primary intended purposes of benchmarking and estimation.

DPO's initial research was conducted using a sample of about 800 projects from the International Software Benchmarking Standards Group (ISBSG) database. This study showed that:

"The accuracy of a model of correlation between actual effort and the software functional size does not decrease when considering only the number of BFC."

In other words, the extra precision of the further classification and detailed sizing of complexity was not delivering a better correlation of size to project effort. The effort of detailed sizing with its attendant cost was not increasing the usefulness of the resultant size obtained.

However, the size as simply a count of numbers of functions does not allow continued use of benchmarking data based on function points.

Thus the next part of DPO's research was to find a structured way of converting the simple count of functions for a software product to the Function Point size as would be obtained using the detailed IFPUG method. This 'same' size is in a statistical sense, of course.

The result is a conversion method which identifies two generic function types equivalent to the Transactional Function Type class and the Data Function Type class of the IFPUG method. Each generic function type is then assigned a constant single generic weighting, 4.6 for Transactional Function Type and 7.0 for Data Function Types. This simple assignment of weights is in marked contrast to the other tedious and lengthy processes required under the most prominent sizing methods.

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As an observation, these values are very close to the IFPUG Average weightings.

Simple Function Points – The Outcome

The method has been named Simple Function Point.

The research findings were first presented by Roberto Meli to the United Kingdom Software Metrics Conference (UKSMA) in 2010. A copy of this presentation can be found at http://www.uksma.co.uk/conferences/conference2011/presentations/07RobertoMeliSimpleFunctionPointDescriptionV2.pdf. The method continues to be well received. Additional research by DPO in a small number of their client organisations has confirmed the same findings.

In June 2011, the Simple Function Point Association (SiFPA) was formed with Robert Meli as President. The SiFPA website, www.sifpa.org, has a lot of good information about both the association and the method. The website is in Italian but Google does a great job of translation, at least into English. A Measurement Manual is now available. Since the technique is compliant with the ISO 14143 framework, it is their intention, in time, to be ISO certified.

Simple Function Points – The Benefits

The key attraction of this method is the simplicity.

- The method can be easily learned in a day, rather than the 2-3 days of full IFPUG training. This immediately is a cost saving. Where there is less to learn, there is less to forget.
- The method is easy to apply. It uses the same rules for identification of functions as the IFPUG method but allows the complicated, often arcane, rules for complexity to be simply ignored.
- Sizing activity is 2-5 times faster than doing a complete detailed IFPUG count. This represents a significant cost reduction for benchmarking.

Importantly, it supports continued use of IFPUG benchmarking data so these assets are preserved.

My own organisation has long held the view that the additional effort of the detailed count was not delivering additional value and so we welcome this research supporting our observation and experience. The simple discipline of identifying all the functionality in a piece of software delivers immense value to an organisation or project, whether for benchmarking, estimating, or managing project scope.

Of course, there may be some push-back from some Software Metrics professionals who may see their skills as being devalued.

However, failure to listen to what the market actually wants usually ends in tears. In this regard, the Simple Function Point solution is worthy of serious consideration.

Robyn Lawrie is a director and principal consultant for CHARISMATEK Software Metrics, www.charismatek.com. She is the Vice Chair – Metrics for QESP and Vice Chair – International Function Point Users Group (IFPUG) Membership Committee. Robyn has more than 40 years of IT Industry experience. A major focus of her career has been the improvement of the software process in general and, in particular, the use of metrics in Software Requirements Management, Scope Management and Estimation.

Differences Between IFPUG and NESMA Function Points

By Pablo Soneira García, PMP, CFPS

Editor's note: *the author here is referring to NESMA guidelines for Software Enhancements, which are not actually part of the ISO approved NESMA method.*

Many times I have been asked about differences between IFPUG Function Points and NESMA Function Points. Many people mix up these concepts. Are IFPUG Function Points and NESMA Function Points the same? Without going into details, in this article I try to explain the similarities and differences between IFPUG and NESMA through a simple example.

History

We can say that the IFPUG Function Points and NESMA Function Points are cousins because they have the same grandfather, which is Allan Albrecht Function Points (Measuring Application Development Productivity, 1979).

The NESMA was founded in 1989 as the NEFPUG (Netherlands Function Point Users Group (Nowadays, NESMA). The NESMA manual focused on the application of function point analysis to software enhancement and maintenance.

Present situation

Despite this divorce between IFPUG Function Points and NESMA Function Points, the counting guidelines of NESMA and IFPUG continuously came closer and closer. With the publication of IFPUG CPM 4.2 (2004), the last major differences between IFPUG and NESMA disappeared. Both NESMA and IFPUG now use the same concepts and terms and the same rules and guidelines for Function Point Analysis. Their close relationship is demonstrated in the latest version of the IFPUG Function Point Counting Practices Manual (4.3.1, 2010).

In Part 3, Chapter 4 "Enhancement Projects and Maintenance Activity", the IFPUG manual refers to NESMA to address the relationship between the functional size of the enhancement and the effort required to implement that enhancement.

Different philosophy

The Philosophy of each method is different. IFPUG Function Points measure the size of the ship that I will paint (either new or changed). On the other hand, NESMA Function Points focus on measuring the size of what I'm going to paint (if the functionality is added, the IFPUG project function point count and NESMA is the same but if the functionality is changed, NESMA calculates the percentage of the ship that I will paint).

Case 1

A work order is sent to a painter for painting an entire ship. We'll analyze this as a development project:

IFPUG: "The Functional Size of this development project is 10 FP."

NESMA: "The function point size of this work is 10 FP."

In both cases we could pay the painter for each Function Point painted. We get information from a benchmark and we use a payment rate 1€ / FP. We will pay 10€ to the painter.

The IFPUG Functional Size and NESMA Functional Size is the same for added functions, both now use the same rules and guidelines within FPA.

(The impact factor for added functions is 1.00)

Case 2

A work order is sent to a painter to develop an adaptive maintenance for painting the ship. We'll analyze this as an enhancement project.

IFPUG: The Functional Size of this Enhancement project is 10 FP. (This does not say anything about Percentage Changed). The Functional size in Case 2 is the same as Case 1. IFPUG focuses on functional size, not in what will be changed.

With IFPUG Function Points you cannot use the same payment rate as in Case 1 (added functions). We need to use another rate for enhancement activities. We get information from a benchmark and we use a payment rate (for enhancement activities) 0.25 /FP. We will pay 2.5 to the painter.

NESMA: The painter will paint only a percentage of the ship, not all the ship (we suppose that the value of the impact factor is 25%). The ship size is 10 FP, but the painter does not need to paint all the ship, the enhancement function point size is 2.5 FP (The NESMA Functional size is the size that the painter has to paint, not the size of the ship).

With NESMA Function Points you can use the same rate than Case 1 (added functions). We could pay to the painter for each Function Point painted. We will pay 2.5€ to the painter (rate 1€ / FP).

(The impact factor for a transaction is determined from the percentage changed in the numbers of DETs and FTRs)

Summary

With IFPUG Function Points we need (at least) two different payment rates, one for development projects and another for enhancement projects.

With NESMA Function Points we can use the same payment rate for all projects.

NESMA tries to address the relationship between the functional size of the enhancement and the effort required to implement that enhancement.

You can use the method you want, but it is beneficial to understand the differences between IFPUG Function Points and NESMA Function Points.

Pablo Soneira García, PMP, CFPS is a Product Manager at Sopra Consulting in Madrid.

Function Points in Modern Ages….Yes! But We Will Need Data!

By Harold van Heeringen, ISBSG, President

Some people ask me: "Why do you still use function points, when this method is already 40 years old and the software industry now is completely different than in the old days, where software development was done in COBOL on mainframes, using the traditional waterfall methodology?"

In my opinion, functional sizing of software is still very important in this so-called 'new era' of mobile apps, cloud computing, virtual reality applications and so on. The business objectives that are addressed with metrics based on functional size are still very valid. In these modern times, organizations still need to accurately and realistically estimate the cost for software projects. They also still need to control their running projects and forecast the projected end results of their projects based on objective actuals of both time spent and product delivered! Furthermore, they still need to know whether their performance is improving over time and whether they are competitive or not. Interestingly, the price per function point is still a mandatory way of contracting in (particularly) the government sectors of many countries and in many other sectors as well.

As the functional sizing methods (e.g. IFPUG, NESMA and COSMIC) are independent of technology and of the development methodology used, they are very much needed in times where both the technology and the implementation methods change rapidly. However, for any functional measurement method to be useful, one needs to be able to process the measurement result into some kind of information that is useful for the organization.

For this to happen, however, we need historical project data to use in our estimates and in our performance measurements. Such historical data is not easily found in most organizations that are not acting on at least CMMi level 3 (or that otherwise have not implemented measurement and analysis processes and benchmarking practices). So, I think that for us to keep receiving the value of using functional sizing methods in this modern era, the challenge is to collect and use relevant historical data that can be used to satisfy the information needs of the organizations in the new world. The International Software Benchmarking Standards Group (ISBSG) wishes to provide this data.

ISBSG is a not-for-profit organization that supports the industry by providing the necessary data for the purpose of improving the overall maturity in the industry. IFPUG is a full member of the ISBSG and it works closely with ISBSG on different levels. The ISBSG collects historical project data from industry through data collection questionnaires. The data is made anonymous to conceal the identity of the submitting organization, verified and stored in a repository which now contains over 6000 industry projects. A second repository contains the data of over 1100 maintenance and support contracts.

ISBSG is completely reliant on data submissions by people in the industry, people like the readers of this article! People like you! Now, I understand that submitting data takes some time and maybe is not rewarding in the short run. However, please consider the fact that historical project data is needed for the software industry to mature and for our profession and functional sizing method to continue to contribute to reducing project risks and to move on and stay relevant!

So, if you have any project data, especially in modern technologies, please provide it to ISBSG and help the industry advance! You will receive a free benchmarking report in return for all the projects submitted that shows the performance of these projects against selected peer groups in the repository. Please download the data collection questionnaire at www.isbsg.org and get involved!

Automated Counting with Type 3 Software

By Chuck Wesolowski, CFPS

The purpose of this article is to discuss the requirements for producing what the IFPUG calls Type 3 software, and exploring specification techniques suitable for automated counting.

Type 3 Software carries out an automatic Function Point count of an application using multiple sources of information such as the application software, database management system and stored descriptions from software design and development tools. The Software records the count and performs appropriate calculations.

Note that while Type 3 software can use multiple sources of information as input, the examples given are available at different times in the development process. The primary benefit of function points is that they are available early in the development process, as they reflect the size of the software in terms of its functional requirements.

Therefore, counting function points pertains to the CMMI Requirements Development process area where Functional

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TI Métricas thanks all who attended ISMA[8] Rio!

TI Métricas was happy to host the ISMA[8] event in Rio De Janeiro in October and would like to thank all those who attended the event.

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Analysis is performed to produce a functional architecture by partitioning functional requirements. This specific practice produces a functional software architecture that is expressed in a specification. This specification must be countable, by hand or by machine.

Any Type 3 counting software must process this specification as an input, perform "appropriate calculations" in accord with a particular Functional Size Method (FSM), in our case the IFPUG method, and produce the results of the count. Furthermore, a given specification must always result in the same count, irrespective of the number of times it is counted, manually or automatically. Therefore, reliable counting, whether manual or automated, depends on formal specification of the software functional requirements.

The entire idea of Type 3 software is to count a formal software functional requirement specification. The question is merely the form. The IFPUG method supports many development methods, for example, object oriented, service oriented, and pure procedural approaches.

The key to any function point count is to understand its scope, and the boundary or boundaries involved. These are determined by business needs and reflected in the software functional architecture. A poor quality specification is one that does not accurately reflect these business needs, and improper partitioning limits the usefulness of any measurements with respect to managing the project.

Note that with Type 3 software, a poor quality specification is counted by the same process as a high quality specification. The quality of the count depends on the quality of the specification.

While there may be only one way to count function points, that is, to apply the rules of an FSM, there are a number of ways to express software functional architecture. Some forms are more suitable than others for counting function points, the best forms are the ones that clearly specify the Base Functional Components (BFC) used by a particular FSM.

For the IFPUG method, the specification must unambiguously identify, Boundaries, Elementary Processes, Data Element Types, and Record Element Types, as well as indicate External Inputs, External Outputs, External Queries, Internal Logical Files, and External Logical Files.

Without this information, a proper count is impossible using the IFPUG method.

Some critical questions include: what artifacts, or "stored descriptions from software design and development tools" used by an organization contain this information? And, are the function point counts derived from these artifacts?

Often the relationship is tenuous at best.

In other words, there is no real, easily manageable, trace between appropriate software engineering artifacts and the reports that purport to measure them. Discipline in specifying functional requirements results in artifacts that are useful to all project stakeholders and improves communication between developers, analysts, testers, management, and most importantly, the customer.

So what is an appropriate software engineering artifact that is suitable for measurement? One answer begins with software component specifications and continues with interface specifications.

A software component meets the criteria for a boundary using the IFPUG method. Moreover, it is a bona fide software engineering artifact, present in a host of software specification methods, and a formal element in the Unified Modeling Language (UML). A software component can be specified, built, tested, delivered, and measured.

A component is defined as a boundary from the CMMI Measurement and Analysis process area perspective. Therefore each component has a functional size, and accrues IFPUG function points in terms of its transactional and data function contributions. From the user's perspective, a component is measured by its interfaces and interface specifications are the place to look when it comes to finding the stuff of function point counts.

Interfaces are the contracts that specify the functionality delivered by the software component that provides the interface. Therefore all parties to the contract have an interest in its specification, as well as the accuracy and reliability of any measures of functional size that pertain to it.

Components are viewed and counted in terms of their provided interfaces. Each component has a set of interface specifications representing logically related operations and data types. These must unambiguously specify the functionality available to the user.

The specification method must produce an artifact that provides input to the automated counting software, and is acceptable to all parties.

The software interface specification is the key software engineering artifact for counting transactional function points. Note that an interface specification contains the definitions of all data elements that cross the boundary between the user and the software indicated by the interface

There are a number of standard formal languages designed for the purpose of specifying components and their interfaces, including IDL, WSDL, and UML.

An Interface specification contains a set of operations. An operation is defined as an Elementary Process (EP) from the Measurement and Analysis perspective. In order to apply the IFPUG method, the transactional function type External Input, External Output, or External Inquiry must be indicated for each operation in the interface specification.

Care must be taken to include enough information in the component specification to permit the identification of FTRs and logical files. This may include the use of pragmas in IDL, extensions in WSDL, or stereotyped dependencies in UML.

Does your organization produce software component specifications that are easily measurable? What artifacts are produced during Requirements Development that are suitable for automated counting?

As you evaluate the utility of integrating Type 3 software into your development process, it is imperative to understand the "stored descriptions from software design and development tools" used by the software engineers, to insure that all required information is included in the specification.

Function Points and Start-ups: Condemned to Understand

By Julian Gomez

Today has internationalized the concept of start-up. Today is a small technology-based company with great potential for scaling and is beginning to develop strongly.

Such companies have to achieve several rounds of funding to be able to have the resources they need to move forward, necessary resources to grow, expand their market and services; in essence, to be bigger.

In quest for funds

Most startups offer guarantees for investors to back a person, an idea, a team, and their high commitment and capacity for work.

Sometimes they defend their company with an elevator pitch, other times with a 15 minute presentation in front of a room full of investors.

Depending on the round of funding and depending on the developmental stage of a product or services, they can offer certain guarantees concerning design and product construction, facilities available, fleet of vehicles (if applicable), current market deployment, etc.

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But, what about the software?

Yes, the main guarantee for most of these companies is the software itself: an application in the cloud-iOS, Android, Windows Phone, etc. - or sometimes even both, that allow a user to perform a series of actions that previously could not be done.

Many experts try to measure these types of applications with the number of hours that the development cost. Then they multiply by the value of labor, et voilà, here we have the cost of the software.

But of course, that is the COST OF THE SOFTWARE and, if I want to invest in a company, I don't want to know how much it costs, I want to know how much the final user will pay for it (according to our business model). The final user will pay depending on the amount of functionality we can offer. The more features and functions they can do, the more they will pay.

Then, how could we measure it?

A better approximation and most successful, considering this point of view, would be to measure the software in function points. Thereby we are able to have an idea of the amount of functionality that is provided to the final user, counted and measure in an objective way based on transactional and data functions.

If the application needs special technical actions, such as - for escalation, for optimization, or for general technical complexity, then the measure could be completed with the SNAP count. That gives an additional value to the software and gives an idea of the technical component.

A unique measure describing the software

With the Function Points count and the SNAP count we have a measure that really describes and quantifies the software and provides a solid basis for estimating cost to the current and future final user/customers. That measure also provides a way to compare the software with any competitors and/or the software that we want to replace.

That value in Function Points + SNAP Points is a more correct dimension that the numbers of hours or the price of development cost in euro or dollar, because those parameters are dependent upon who develops the software (what company), the expertise level of the development team (knowledge, mastery in development tools), methodology used, people that work on the project, etc.

THE EXPERIENCE OF A SNAP USER: A WAY TO USE SNAP FOR SOFTWARE COST ANALYTICS

By Charley Tichenor

SNAP is enjoying a very good first impression within our organization. In fact, some of our project teams are not only welcoming SNAP, but are politely demanding SNAP. Let me explain why.

Although there are several purposes for our software metrics program, probably our major purpose is to control software development costs. One goal is to arrive at the cost per function point that each of our project development teams is achieving. All other factors being equal, project teams having costs per function point which are comparable to industry benchmarks are approved for funding for their future work and those which are too far above industry benchmarks are not approved for funding.

These are among the best benchmarks in general industry use today. Now with SNAP starting to enter the industry, it is clear that some of the software development work which had been "charged" to function points really was non-functional. In hindsight, one might say that this sometimes tended to inflate the costs per function point project teams achieved. So by using SNAP, project teams can now better apportion their development costs between non-functional and functional, thus better portraying their reported costs.

Here is a hypothetical example. Suppose that our ABC project team developed their first release of a software application, and realized a total development cost of $480,000. The function point count of that application was 800 function points, so their cost per function point would initially be calculated at $600.

But suppose further that the application also had 500 SNAP points. For planning purposes, our organization is using a notional local standard productivity rate of 1.65 work hours per SNAP point, so the 500 SNAP points justify (for us) 825 work hours for the non-functional portion of the software development. Suppose the project team's average cost per work hour for those SNAP points was $80. That means that their cost for non-functional work was about 825 * $80, or $66,000. This also means that their cost for functional work must be closer to $480,000 - $66,000, or $414,000. So, their cost per function point should be better estimated at $414,000 / 800, or about $518. This is a more accurate cost per function point due to recognizing SNAP. So when the project team presents a business case for funding future functional enhancement work, they will use $518 per function point as their cost estimate - not $600. Should there be non-functional enhancement work in the business case, it will be separately forecast at 1.65 hours per SNAP point.

	Non-functional	Functional
Size	500 SP	800 FP
Average labor cost per hour	$80.00	
Hours per SNAP point standard	1.65	
Cost per SNAP point	$132	
Total non-functional cost	$66,000	
Total functional cost		$414,000
Cost per function point		$517.50

So this simple example starts to show why SNAP is welcome! We give project teams credit for work effort completed for both non-functional and functional work, and we more clearly classify which costs are aligned to non-functional and to functional work. We can now even more clearly benchmark performance. And finally, it shows that the software metrics from IFPUG are capturing both non-functionality and functionality, which improves the perception of fairness in the metrics program.

Processing Logic

By Steve Neuendorf

Steve has some particular views on aspects of function point counting and we thought they are worth reproducing here.

Processing Logic – I Find that Highly Logical

From Sherlock Holmes, "It's Elementary my dear CFPS " (Metrics Views, January 2011) we can move on to Star Trek's Mr. Spock, "I find that highly (il)Logical." Let's talk about processing logic (PL).

Our glossary defines PL as: "Any of the requirements specifically requested by the user to complete an elementary process (EP) such as validations, algorithms or calculations and reading or maintaining a data function." The CPM lays out a list of processing logic items, along with explanations and notes and hints. Let's take a close look at PL.

First and most obvious is that a PL item is a requirement. It is important we interpret that to mean it is a functional user requirement (FUR) (what is done) and not a non-functional requirement (NFR) (how the FR is done). It is also worth noting our definition states "specifically requested by the user," which we understand to mean either "Expressed" or "Expected" as a functional requirement. Finally we must note the statement of purpose: "to complete an elementary process ...." (Emphasis added). This seems to make it clear there is no intent to make or imply that the listed elements of PL are dependent on each other to satisfy a requirement. Each item would be capable of satisfying the user requirement as described in the listing without dependence on an action described by any other PL element and regardless of HOW that PL item completes its function.

We talk about PL in two contexts. We talk about a "set of processing logic" and evaluate that against other "sets of processing logic" when doing a uniqueness test for EPs. We also talk about "changed processing logic" when evaluating enhancements.

A "set" in math is the potentially confusing "group of one or more things." First, we consider processing logic as "confined" by EPs. In operating software, the flow of processing and logic are considered to be continuous, but in counting function points, we divide the flow up in consideration of how we have identified the EPs. In consideration of identifying appropriate "sets of processing logic" we characterize the PL at the level of the CPM PL list, instead of generalizing the processing and logic or expressing it at lower levels of detail. Further, if an EP has multiple instances of a PL item, we still will characterize the set of PL as having one and only one instance of that type. So, say an EP has four different validations, we would only identify a single instance of "Validations are Performed" in the PL set.

As in all things FP, we must remember we are looking at the application from an end user view. Any number of reports, for example, could all have different processing and different logic, but from a user view, all have the PL of "preparing and presenting information outside the application boundary" in common. Another important consideration in doing the comparison is recognizing we are comparing "sets" of processing logic and not just the elements of processing logic. If we are looking at just a difference in processing logic (prior to CPM 4.2), we only need to compare the elements of each set, and if one set has some different elements from the comparison set, we would say it had different processing logic. In going to the notion of sets, we also have to note that a "proper subset" is not a different set. We would say set B is a proper subset of set A, if ALL of the elements of B are also present in A. As a practical example, let's compare two sets of PL in two reports produced by our application. The reports reference the same files, include the same DETs and have the same processing logic, except that one of the reports includes the total of the various instances of one DET on the other report. So one report contains one more DET and one more element of PL (mathematical calculations are performed) than the other. So the "big" report has one more element of PL and one more DET than the "little" report, but every DET and PL element in the big report set is also in the corresponding little report sets. So the little report set of PL (and set of DETs and set of FTRs too) is not "different,"

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rather it is a proper subset or, in our vernacular, the same set. The little report EP would not be unique from the big report EP. Remember, now we do not classify the EP (primary intent) until after we have performed the uniqueness test.

Different sets of PL would be where both sets have an intersection of common elements but each set contains elements that are not common with the other.

So, for example, when the little report is produced it updates the FTR where the data is stored. The big report performs mathematical calculations, and that item of processing logic is not contained in the little report. So it is correct to say that the two reports have different sets of processing logic.

So let's look at each element of PL from the 4.3.1 CPM. We find the first listing of the PL at Part 1 at 5.5.2.3 Table 3. The first thing to notice is that the list is exclusive. Earlier versions of the CPM said the PL "included but was not limited to," then listed the 13 items we will discuss here. That, among other things, should make it clear the PL is a FUR and not technical.

Item 1 is "validations are performed," and the example is of validating an employee type DET. For the example, the employee type DET (by the DET definition) is within the user view, and we could say that steps such as insuring the value is present or that it is spelled correctly would be a validation that is also a FUR. Looking at something more subtle, say it is also required to enter a hire date for the employee. Say the system requires all dates to be in a certain format - mm/dd/yyyy. So checking the date format is certainly a validation, but it is a technical requirement, and alone not sufficient to say the PL 1 is a part of the set of PL for that EP. If we note the hire date is a required field because many other processes need it to complete, enforcing required fields or say flagging incomplete records is certainly what is considered by this PL item, and we would include it in the set. It cannot be over emphasized that PL is the "what" is done in FP counting that determines the result, and not "how" it is done.

Item 2 is "mathematical formulas and calculations are performed." It is important to note that there is absolutely nothing a computer can do but use formulas (constructs) to perform mathematical calculations. See "Lovelace's Leap".[1] So it must be that the CPM and those responsible for its creation and maintenance considers it possible to have elementary processes that do not have the PL of having mathematical formulas and performing calculations. It should also be clear that if we considered all of the math done in any process, we would never have an EQ, since an EQ cannot include PL Item 2. We are given the example of calculating a total on a report. Here we need to look at the interdependence of the other PL items to understand when to include or to not include Item 2 in our set of processing logic. As an example and since we have already discussed Item 1, say a validation was performed for each day's time entry to assure an employee had not exceeded the time limit for that day or for the week. The validation would require checking the limit and the prior total along with the proposed entry and either accepting or rejecting the attempt, or perhaps accepting all entries but flagging any over limit conditions. The validation FUR has the requirement that includes the apparent math, but doing the math is not a separate functional requirement. So if the validation were our only FUR, then only that item would be in the set of PL.

Item 3 is "equivalent values are converted," and we are given the example where employee age is converted to an age range group e.g., 53 = 50 to 55 group. The example goes on to describe how it is done, but since how is not in the end user view, it is not relevant. Other examples would be things like converting gallons to liters or Dollars to Euros. Again, these all require math, but the math is an integral part of PL Item 3 and it fully satisfies the FUR to perform the conversion without the additional PL Item 2 needing to be specified by the user or included in the processing logic set.

Item 4 is "data is filtered and selected by using specified criteria to compare multiple sets of data." This one also seems to have some elements of "how" in its description and in the example offered. And again, consider if we had the example where each record had the employee type, job assignment and duration of assignment within that job. The FUR is to produce a list of say all hourly employees with more than 10 years within some certain assignment. Producing this list fully satisfies the FUR that is PL Item 4.

Item 5 is "conditions are analyzed to determine which are applicable," and we are given the example of entering DETs based on whether an employee is hourly or salaried. An example where

[1]Augusta Ada King, countess of Lovelace, along with her counterpart Charles Babbage, were pioneers in computing long before the first computer was built. Despite being an uncommon pedagogy for women, Ada was educated in mathematics because her mother hoped would mitigate in Ada her father's, Lord Byron's, penchant for poetry and mania (it didn't). While Babbage drew up designs for the first general-purpose computer, which he called the Analytic Engine, he only imagined it would be a powerful calculator. Lovelace, however, anticipated the much more impressive possibilities for such a machine. She realized the engine could represent not just numbers, but generic entities like words and music. This intellectual leap is the foundation of how we experience computers today, from the words on this screen to the colors and shapes in this doodle. In 1843, Ada published extensive notes on the Analytic Engine which included the first published sequence of operations for a computer, which she would have input to the Analytic Engine using punch cards. It is this program for calculating Bernoulli numbers which leads some to consider Ada Lovelace the world's first computer programmer, as well as a visionary of the computing age. http://www.google.com/doodles/ada-lovelaces-197th-birthday

this PL was not involved would be where you always filled out the same form regardless of any "conditions" compared with one where is was where entries or navigation resulted in filling out different forms for different conditions. We can note the example is very carefully worded to assure one understands that this type of PL does not indicate separate EPs.

Item 6 is "one or more ILFs are updated" and we are given the example of updating employee data. That seems straight forward, but here is where we must consider the possible interdependence of the separate elements of PL. It is clear the examples are all referencing the same system. From our example for PL Item 2, we are actually given information that is clearly outside the user view: "the process includes calculating." We would not expect the user to know or care if the totals were calculated when the data was entered with the totals calculated and stored, or if it was calculated when the data was retrieved, or even if it were calculated independently of either of those specific processes. As counters, we must determine if that FUR for the totals is included in the EP that maintains the data or if it is included in the EP that reports the data. And too, the decision will make a difference in the FP count. If that difference is material, the decision should be documented.

Item 7 is "one or more ILFs or EIFs are referenced" and one of the more interesting PL elements. We know from the FTR rules, we count an FTR if a data function is "read from and/or written to". The example given clearly has both PL Item 6 and PL Item 7, though from a technical view, it would not be possible to have PL Item 6 alone. From an end user view, an EP could have neither, either or both PL Items 6 and 7.

Item 8 is "data or control information is retrieved," which seems quite similar to Item 7. In fact, if we look at Table 5 "Relationship between processing logic and transactional function type" we see that both have a similar description and an identical relationship with the three transaction function types. We can also consider the EQ rule that says there must be at least 1 FTR, so it seems clear that those logic steps associated with Item 7 are a subset of those comprising Item 8. So it could be possible that an EP's set of PL would include Item 8 but not Item 7, but if it included Item 7, it must also include Item 8. That both are mandatory for an EQ is consistent with that analysis. It does not seem there is any meaningful difference between "referenced" and "retrieved" from an end user view. The difference then must be between the specific ILF or EIF and the more general "data or control information." We need to look at the operating definition of Data, and see we don't have one. We can look at how we use the word data, and we see some ambiguity, but if we create a construct that is consistent with all of our use of the word, we can move forward with our analysis. The minimum definition is that we have a universe of "data" where Data Element Types (DETs) and Control Information items (CI) are proper subsets of data. Practically, there is an intersection between DET and CI. The complements of the DET and CI union would be things like Code Data or hard coded instructions and attributes. Can we think of an EP example where PL Item 8 is a member of the set of PL and Item 7 is not? On closer examination, it is hard to identify an instance of many of the PL items that do not include also PL Item 8.

Item 9 is "derived data is created by transforming existing data to create additional data." This PL item is often confused too. The literal interpretation of the definition would indicate that mathematical calculations would also be included in this PL as a proper subset with the whole set also including other derivations, such as parsing and/or concatenating data. Derived data could use business data, reference data, or even code data and hard coded elements to produce derived data. The key to identifying derived data is the derived data DET cannot be uniquely identified as a logical data DET.

If we take the definition of derived data literally, then it would not be possible to have an EP that just contained calculations (Item 2) which did not also contain Item 9. It would be inconsistent with our common notions of uniqueness and "self-contained" to think it was intended on uniquely identified form of processing logic could only exist in the presence of another form of processing logic. That conclusion would also be supported by looking at the rules for distinguishing an EO from an EQ. We ask both if calculations are performed AND if derived data is created clearly implying either condition is independently among the possible states.

Item 10 is "behavior of the application is altered." This is a little more difficult item to envision because we are usually more experienced working with "Data Strong" applications. We can think of applications as being either "Data Strong" (data management systems - e.g., telecom account records) or "Processing Strong" (high volume limited processing - e.g., telecom billing systems) or "Control Strong" (ensuring desired behaviors - e.g., a system for keeping a telecommunications satellite in its proper orbit and orientation).

A clearer and more common example would be the volume control on a music player application where using the control makes the music play louder or softer.

Item 11 is "prepare and present information outside the boundary." This PL Item also clearly would be intended to fit the pattern of being self-contained for any individual transaction. Preparing output, be it traditional Print, File, Screen (PFS), or various forms of energy (sound or EM waves) and even now, physical matter/design, as in 3D printing. Clearly any instance of an elementary process will include many of the other PL components in this list, but the logical intent is for the PL item to be self-contained. So printing a report set up for an 8.5" x 11" onto on A4 paper "performs mathematical calculations" and "performs conversions", but you would not include those elements in the PL for that transaction unless they were specifically identified as a stated functional requirement.

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Let's take two examples of producing a regional sales report with a graph of sales totals and percentage changes. In the first instance, since all of the data within the applications are within the user view, it can be seen that all of the DETs in the report are also DETs on the application ILFs and EIFs. Even though the production of the report would require considerable conversions and mathematical calculations (again, everything is mathematical calculation, see generally Lovelace's Leap) to prepare and present the report as required, no additional PL is required to satisfy the user's functional requirement other than "prepare and present information outside the boundary." All other things being equal, the first report is an EQ. For the second instance, imagine that the sales totals and percent changes are not DETs on any application ILFs or EIFs. Now, the EP, still has to prepare and present information outside the boundary, but it must also perform mathematical calculations to produce some of that information. The second instance of the report is clearly an EO, and that can be conclusively determined from fully within the user view.

Item 12 is "capability exists to accept data or control information that enters the boundary of the application." This is self-explanatory and easy to understand. But still it warrants some discussion since it is a required element to count an EI although it is still not unusual to find counters wanting to count EIs where this PL is not present. This PL item is also helpful in identifying complete transactions for EP analysis purposes. The example would be a sales system, where each cashier's sales are saved locally throughout the day. At the end of the day, all of the daily transactions are uploaded and used to update sales and inventory records. On analysis, the sales transaction is not meaningful (it does not satisfy the functional requirement until the sales accounts and inventory records are updated). Yet still, too many people doing counts want to count the uploads and updates as a separate EI, even though the data used in the updating does not cross the boundary as a part of that identified transaction.

The last item in our list, Item 13, "Sorting or arranging a set of data" is also important in that it is not considered in determining the uniqueness of an EP. A simple example would be where data in a table is sorted on one field or another, say for example by name or by hire date, but it also includes conditions where a report may have several sections, such as a section with a view of the data from a sales person and region point of view, and the same data with a view from a product perspective. Especially where reports are produced separately for different audiences, counting care must be taken to determine if these reports are in fact unique.

That concludes the discussion of PL from the perspective of identifying the set of PL for an EP and testing for uniqueness. It is important to remember first that the PL is a stated functional user requirement as seen from the end user view.

The other important perspective when considering PL is what constitutes changed processing logic when identifying changed transactions for enhancement counting? Just like at the level of Adding or Removing transactions in an enhancement, adding or removing elements of PL as part of changing a transaction would clearly indicate that transaction should be included as changed in the enhancement count. What might not be so clear is if changes to an element of existing processing logic, so that what it does remains the same from the user view, constitute a countable change. Here, the CPM states at 4.3.1.3 at page 4-4: "In all cases, the user requirements and the business view shall be the determining factor." Clearly if the user requires something like changes to validated fields or to how the fields are validated, then a change is counted. If the user requires that a calculation be changed, then that transaction is included in the enhancement count. If the validations and formulas are changed for non-functional reasons, like to allow faster processing, then those PL changes would not constitute changes that can correctly be included in an enhancement count.

Happy Counting
Steve Neuendorf

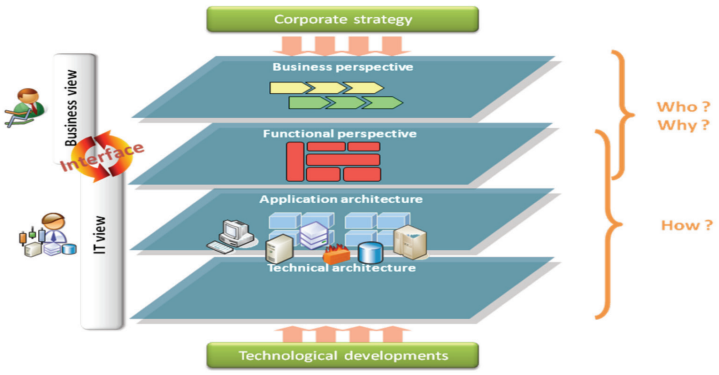
Steve Neuendorf is a solutions architect with over 40 years' experience working in the areas of software measurement and management, project management, benchmarking, business management and quality improvement. Steve has been using Function Points since 1982. Steve has authored two books, Project Measurement and Six Sigma for Project Managers and numerous articles on a variety of measurement related subjects, including the Process Improvement chapter for The IFPUG Guide to IT and Software Measurement,. Steve has business related bachelors, masters and doctorate degrees.

Measuring Enterprise Architecture with IFPUG FP

By Lionel Perrot, CFPS

Many architecture modelling frameworks coexist [Zachman 2012], [TOGAF 2012] [Longépée]. The chosen approaches are mostly based on at least four hierarchic superimposed layers:

- Business Process Layer (BPL)
- Functional Layer (FL)
- Application Layer (AL) which is built by development projects but improved at each enhancement project
- Technical Layer which includes Exploitation system, database description, networks, security and so on…



Historically, IFPUG Function Point Analysis has focused on the two lower layers.

- The Application Layer (AL) is covered by the Function Point Counting Practices Manual [IFPUG CPM 2009].
- The Technical Layer was slightly expressed through general system characteristics and Adjustment Factor (AF). For the last two years, the incoming Software Non-functional Assessment Process [SNAP 2012], based on non functional requirements measurement, has improved the way to take the Technical layer into account.

Our primary intention is to propose the main rules to use IFPUG FP measure for both superior layers: Business Process Layer (BPL) and Functional Layer (FL). Then, we will run those measures as to pilot and align the IT governance with the different elements composing the intra and inter layer [PA 2012 1].

Measuring the Business Process Layer

We have defined several visions of BPL measure:

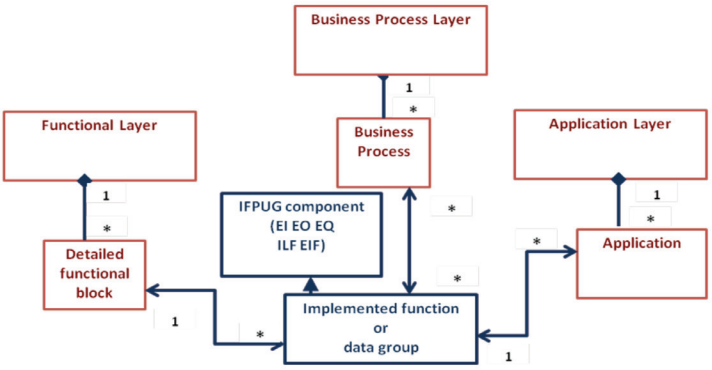
- The **static vision** takes into account manual and automatic functional components. For example, if an employee reads a letter, it is a manual EQ, but if (s)he displays a scan of the letter on a screen is an automatic EQ.
- The **volumetric vision** completes the static vision introducing the notion of frequency associated with the actions and transactions into the BP, for a period of time. For example, if an employee displays a list of customers waiting for an answer in the morning, and the team leader does the same at the end of the day, then we count 2 EQ.
- The **dynamic vision,** governance oriented, is based on the volumetric vision and takes into account the time needed for the user to achieve one FP. For example, if an employee takes on average 30 seconds to display the list of customers that must answer to a letter (low EQ), we say that it takes 10 seconds to run 1 FP.

Measuring the Functional Layer (FL)

The FL represents the logical union of functional user requirements (humans and artifacts) of the whole information system. By construction, data functions and transactional functions are counted only once, within one unique functional block, even if they are maintained or duplicated through multiple applications. (For example, "Display the list of customers" is counted only once for a complete information system).

The functional layer shows the ideal of what should be automated to ensure consistency of the information system with the objectives of the enterprise. In reality, it is impossible to achieve this state of perfection. We propose to quantify the gap between the ideal and the actual situation using FP measurement.

New measurement process, new tools, new repositories, new indicators



In our presentation to ISMA8 2013 [PA 2013], we quoted the following points:

- Measurement process: We ask for the cooperation of enterprise architects and functional architects while measuring FP. We encourage our clients to perform a measurement of the three layers (BPL, FL, AL).
- Tools: We build tools for measuring the three layers during the same measurement process, and for establishing links between these three layers.

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- Repositories: We are now building a repository of functional sizes of enterprise architecture components. Oriented toward mastery of IT processes (such as the ISBSG repository) and oriented toward corporate governance. It must include, when available, the execution time of actions and transactions, profiles using each function or data, frequency of launching the functions, time saving when automating a function, duration of training sessions, etc.
- Indicators: We compute the various ratios between the three layers. The relationship between the functional dimensions of the layers express either structural balances that should be reinforced or structural imbalances that must be addressed quickly.

Advance work

Until now, we applied our approach to about 20 different contexts and selected four of them to illustrate the method. The results are presented in more detail in our white paper [PA 2012 2].

Static vision: Organization transition cost in the medical field. We have built a tool for estimating transition effort. It is based on the number of FP that each profile must master (doctor, pharmacist, assistant, etc.) and learning time for 1 PF.

Volumetric vision: Financial argument betweens two organisms in Governmental field. Two departments are not agreed on the distribution of costs for a common SAP application. We proposed a volumetric measure to help them to agree.

Dynamic vision: Estimated financial losses due to unavailability of applications in the field of energy.

Dynamic vision: Staff sizing and change policy in the domain of retirement. We estimated the number of employees to process hundreds of thousands of retirement files in the coming years.

Proposition

We propose to create an interest group under IFPUG auspices focused on Enterprise Architecture measurement and the usages of these measurements.

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Certification Committee

By Greg Allen, Chair

The Certification Committee has been very busy lately. We have had Regional CFPS Exams in Spain and Japan during 2013 and there has already been a request for another Regional exam in 2014. The automated CFPS Exam is really showing the "International" in International Function Point User Group. Half-way through fiscal year 2014 we have had candidates from 14 different countries take the CFPS automated exam.

The Certification Committee also has a new certification, Certified SNAP Practitioner (CSP). The committee worked with the Non-Functional Sizing Standard Committee (NFSSC) to develop the exam and the first sitting was held in conjunction with ISMA Rio in Brazil. Joanna Soles is the CSP sub-chair for the Certification Committee and deserves recognition for heading up creating the exam and did a great job of coordinating all of the people involved in designing, creating, reviewing, testing and translating the exam to be ready for the first exam at ISMA Rio.

The CFPS Certification Extension Program continues to gain in popularity. More CFPS Certification Extensions were earned in FY 2013 than any year previously and FY 2014 seems to be keeping up with the record-setting 2013 pace.

Communications and Marketing Committee

By David Thompson, Chair

Maintaining communication with the membership; tracking website statistics; new committee members

In the past six months, the CMC has processed 40 website update requests and sent 17 mass emailings (eBlasts). A new mail group was established - the IFPUG Immediate Broadcast Network (IIBN) - consisting of 275 IFPUG members who are frequent users of social networking sites. These members have agreed to post IFPUG-related communications on Facebook, Twitter, and LinkedIn, extending the reach of our eBlasts and website announcements into social media. A number of

communications were targeted at the ISMA Rio conference in October.

The most significant website update was the listing, on the Conference Content page, of the remainder of 335 conference proceedings from 1999 - 2009. These proceedings were uploaded by the Membership Committee to the IFPUG file server in January. On October 2 we received board approval to list them all on the Conference Content page, and by October 23 they were all listed, along with links to the uploaded documents. Our plan is to keep the most recent two years of proceedings in the Member Services Area, and to list, with links, all proceedings older than that.

We began collecting and analyzing website statistics, using data collected via Google Analytics and by WordPress, our website publishing tool. This has given both the Committee and the Board an excellent picture of what pages are most visited, and where the visitors are located. With this information we can better target potential website advertisers, and stay focused on the most important information to post on the website.

We have been exploring, along with the Membership Committee, creation of a new member packet, to help integrate new IFPUG members into the activities of the group. Stay tuned for more on this.

As a consequence of the board elections in September, the CMC has a new Liaison to the Board - Dácil Costello in Madrid will be fulfilling that role. Welcome, Dácil! Also, David Herron, one of the founders of the David Consulting Group, has joined the Committee. His focus will be on marketing, and on assisting Paul Radford in editing the MetricViews editions.

Stay tuned for more from the Communications and Marketing Committee.

Conference & Education Committee

By Luigi Buglione, Director

The Conference & Education Committee (CEC) has started to work for 2014 events: after the last ISMA conference held in Rio de Janeiro in October, "ISMA^9 in Europe" will be in Madrid (Spain) on March 24-27 2014, for the benefit of the European measurement community. The focus will be balanced between technical and business topics, including of course with FPA and SNAP counting experiences, but also other kind of measurement experiences, looking at a broader, holistic perspective. Don't forget that the aim of ISMA events is – as from its acronym – to be the 'International Software Measurement & Analysis" conference. Thus, as in CMMI, SPICE (ISO/IEC 15504) or

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Behind the Scenes

by Connie Holden, Executive Director

2013 has been quite an eventful year at the IFPUG Headquarters Office. We had to say goodbye to Liz Bertolotti as she has left to pursue other interests. On a happy note, we are pleased to welcome Dawn Capizzi to the IFPUG team. Dawn is our new Association Coordinator and will be working on member relations and database management. She brings a passion for servicing clients and trouble-shooting to help customers in need. Dawn will be working to send out the CFPS, CFPP and CSP certificates.

ISMA^8 was a great success and we were able to meet many of the IFPUG members while in Rio de Janeiro. With ISMA^9 being held this March in Madrid, we again look forward to meeting IFPUG members from Spain, as well as those traveling to the conference. Plans for September or October are still being formulated. Continue checking the IFPUG websites for more details.

We are always interested in what our members are thinking in terms of membership value as well as the counting community. Please remember to visit our Facebook and LinkedIn pages as well as following our tweets. You can add your social media information to your IFPUG account profile. The IFPUG ISMA Insights Bulletin Board is an excellent place to form groups and share information. The articles in this edition of MetricViews will have discussion pages for you to ask questions or make comments. Please let us know what you think! As always, we look forward to hearing from you at ifpug@ifpug.org.

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other maturity/capability models, we will include both the 'Measurement' part - including the definition of balanced measurement plans and measures, and the 'Analysis' part – including the data gathering, checking, analysis & reporting. More information about 'ISMA[9] in Europe' agenda, fees (of course, discounts for IFPUG members) will be posted soon at www.ifpug.org and at http://www.measuring4business.com.

The second 2014 event (ISMA[10]) as usual will be held during fall: CEC is working now on its preparation. Further news through the IFPUG website and with dedicated e-Blasts will be spread during next weeks. If you are interested in taking a look at proceedings from previous IFPUG events, please click:

- here for 1999-2011 events
- here for 2012-2013 events (only for IFPUG members, using your credentials and selecting the desired event from the 'Category' combo box)

Last but not least, if you are interested in joining CEC and giving your support and ideas, please send an email to ifpug@ifpug.org.

Membership Committee

By Roger Heller, Chair

The Membership Committee has gone through several changes since our last report. A significant update is that Dácil Castelo has been elected to the IFPUG Board of Directors. We congratulate Dácil on this accomplishment. Our efforts to organize an IFPUG focused conference in South Asia have been put on hold. We hope to renew this effort in the coming year. The Communications and Marketing Committee has implemented the IFPUG archive on the public side of the website. Be sure to visit this site to gain important insight in to various software metrics usages. We continue to explore new opportunities to aid existing and future members. We will update you on our progress in future releases of MetricViews. The success of our committee is tied to how well IFPUG supports your needs. To that end we have established a bulletin board area in IFPUG Insights where you can submit questions and contribute ideas. Visit the bulletin board and let us know if there is anything we can do on your behalf to help make your participation in IFPUG more valuable. Please feel free to contact us through the Membership Committee group on IFPUG ISMA Insights or through the IFPUG office.

Functional Sizing Standards Committee

By Tammy Preuss, Chair

The FSSC published Data Conversion & Shared Data Real Time Requests iTips and Applying Function Points to Scrum Agile white paper in the last 3 months of 2013. We welcomed Diana Baklizky as a new member of the FSSC. In 2014, we will be publishing iTips, uTips and white papers on Project Testing, Applying Function Points in the Early Stages of Development, and Embedded Software.

Non-Functional Sizing Standards Committee

By Talmon Ben-Cnaan, Chair

SNAP method of non-functional sizing continues to evolve.

The SNAP metric played a major role in ISMA[8], held in October 2013 in Rio de Janeiro, Brazil.

Many speakers in the conference referred to IFPUG's two sizing methods, FPA and SNAP, realizing the importance of sizing both the functional and non-functional requirements.

The Brazilian market welcomed SNAP with a big hug!

- A SNAP workshop was conducted before the ISMA[8] conference.
- The first SNAP certification test resulted in 20 new Certified SNAP Practitioners.
- SNAP was referenced by representatives of the Brazilian government as a possible improvement to the current software pricing mechanism in Brazil.
- Manufacturers of software estimation tools expressed their wish to add SNAP into their estimation model.

These are not the only achievements of the NFSSC this year.

- A two-day workshop on the Internet was successfully delivered. This is also the first webinar delivered by IFPUG.
- The SNAP metric was published in the 25th anniversary issue of "CrossTalk - The Journal of Defense Software Engineering."
- SNAP's first case study was published and is now available at the IFPUG online store.
- There is continuous growth of SNAP interest groups on IFPUG.org and the SNAP interest group at LinkedIn.
- The SNAP Assessment Practices Manual was translated to Portuguese.
- ISBSG has added the option to collect and store SNAP data, as part of ISBSG's software measurements questionnaire

We hope to keep the momentum going in 2014 as well. Additional SNAP certification tests are planned to take place in Madrid at the end of March and in Rome at the beginning of May. More webinars will be provided to consulting companies who wish to train SNAP users, to manufacturers of software estimation tools who want to use SNAP as part of the estimation process, and to the public.

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The data is also used for estimating software development projects' productivity, cost, schedule, and staffing. Q/P has incorporated the benchmark database and our industry accepted project estimating methods into the only FP based project estimating tool available via the Internet.

We also offer the Software Measurement, Reporting and Estimating tool, SMRe. SMRe users can generate software development estimates using historical and/or industry benchmark data. The SMRe estimating model is based on Q/P's proven software estimating methodology, which incorporates an innovative risk assessment. SMRe captures, reports and compares project performance against historical and/or industry benchmark data.

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Overall, our solutions enable high quality, on-time and on-budget delivery of software through all phases of the development lifecycle. In fact, our clients experience at least a 50 percent improvement in the cost and delivery of changes to their software development processes compared to in-house efforts.

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For more information, visit www.davidconsultinggroup.com or call 610-644-2856.

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Rio de Janeiro, Brazil

TI Metricas specializes in the application of software measurement to Information Technology. Based in Brazil (Rio, Sao Paulo, and Brasilia), the company employs over 50 IFPUG-certified full-time specialists, including CFPS, CFPP, and CSP (SNAP). In addition to FP and SNAP specialists, TI Metricas also includes professionals holding certifications such as PMP, COSMIC, CSM, PMI-ACP, COBIT, ITIL, and PSM – Practical Systems & Software Measurement. Our company received the "PSM Outstanding Organization Award" from the PSM Support Center (US Army) in 2003.

TI Metricas is a leader in function point counting and software measurement consulting & training. Our clients come both from the private sector – air transportation, energy, banking, insurance, telecom, credit cards, cable TV, etc. – and government – government agencies, departments, banks, etc. We currently count approximately 60,000 function points per month.

Our business model combines local presence with remote services in order to provide high-level service regardless of geographical location. Being based in Brazil helps us to provide our clients with both affordable prices and world-class professionals. www.metricas.com.br/

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Melbourne, Australia

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IFPUG Events in Rio de Janeiro, Brazil

Brazilian Hospitality Shines Through

by Steve Woodward

September marked the first SNAP onsite Training and the first SNAP Certification Exam in the world, which was held in Brazil.

IFPUG presented the ISMA8 conference in Brazil this past October. Brazil's hospitality provided for great discussions and sessions with new formats.

IFPUG then President, Joe Schofield stressed the importance of Brazil's participation with IFPUG and expressed sincere appreciation to the organizers for hosting the event in beautiful Rio de Janeiro. Mauricio Aguiar, a true ambassador, continued to amaze everyone with his outstanding efforts to collaborate and network within the software measurement community, while extending exceptional support and hospitality to everyone.

Several innovative formats included the "Open Space" Un-conference on Day One, where Márcio Silveira of HP did a great job facilitating the discussions and energizing the group. The discussions were engaging and informative, and several recommendations were made to guide IFPUG into the future.

The day finished off with John Wright of NASA/Jet Propulsion Laboratory, driver of NASA's Mars Rover, who presented on the Mars Rover and the complexities experienced with the software and other business assets live on Mars. This was one of the most exciting and dynamic presentations at any IFPUG ISMA conference. Steve Woodward had the privilege to work with John, while performing additional research to develop the presentation on "Function Points on Mars." This clarified boundaries, data and functions on Mars with a focus on the valuable insights that the IFPUG method can provide, even on Mars! Thanks again to John Wright for making the journey to Rio de Janeiro.

Day Two was a more traditional conference with fast paced panel discussions, in addition to tremendous keynote speakers that set the stage and tone for the day.

Kriste Lawrence of HP, and the upcoming president of IFPUG, kicked off the day, clarifying the importance of IFPUG and the future strategies for the organization regarding software measurement. Nazaré Bretas, Undersecretary for the Secretary of Logistics and Technology in the Brazilian Ministry of Planning and Administration did a fantastic job highlighting the critical role that software metrics play to improve governance and transparency in Brazil.

IFPUG members will be able to access the presentations on the Members' Services Area, Knowledge Base Page.

Thanks to the ISMA Rio sponsors: TI Metricas, Sizify, FPA Suite, Function Point Tools and Abrantes Soluções.

Brazil continues to lead the world in software measurement capabilities and maturity. Obrigado Brazil!

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Visit the IFPUG Website at www.ifpug.org

ISMA9 CONFERENCE REGISTRATION HAS BEGUN

Visit UPCOMING EVENTS to register now.

Updating your information is now easier with the Members' Services Area on the website. Visit today to update your profile so you won't miss out on upcoming news and events.

Publications can be ordered through the Online Store featured on the IFPUG website.

Many items are now available for immediate download.

ISMA10 October Conference planning is underway and information will be on the IFPUG website in the future.

CHECK IT OUT!

We want to know... send your comments on the new website to ifpug@ifpug.org

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ISMA9 IN EUROPE

March 27th 2014 - Madrid, Spain

"MEASURING FOR BUSINESS"

How measurement and software metrics can add value to IT and business.

After visiting Phoenix (USA), Río de Janeiro (Brazil), etc. IFPUG has chosen Madrid as the venue of its next international conference ISMA 9 IN EUROPE in partnership with LEDA mc.

This conference is focused on "WHY MEASURE" software. That is, what values does it offer and what benefits it provides.

It's intended for IT managers, Senior Project Managers, Certified IFPUG Professionals, etc. and will provide valuable insights to various key aspects and challenges of IT Governance:

- How to successful estimate projects.
- How to effectively manage suppliers.
- How to measure software accurately.

LECTURERS

The conference will feature prominent and accomplished IT professionals, including:

- KRISTE LAWRENCE, USA (IFPUG, President)
- JOE SCHOFIELD , USA (IFPUG, Past President)
- CHARLES SYMONS, UK (COSMIC, Past President)
- MAURICIO AGUIAR, Brazil (TI Metricas, President)
- HAROLD VAN HEERINGEN, Netherlands (ISBSG, President)
- LUIGI BUGLIONE (GUFPI-ISMA President / Engineering Group) and NICOLETTA LUCCHETTI, Italy
- RAFAEL DE LA FUENTE, Spain (LEDAmc, President)

Success stories of several Spanish companies, leaders in their sectors will also be presented.

OTHER VALUABLE ACTIVITIES - March 24 - 26

During the week of the conference, three important activities for the Software Metrics & Measurement Community will take place in Madrid:

- A two-day SNAP workshop, in order to improve the measurement practices of non-functional elements like parameterization or conversions.
- A CFPS certification exam.
- A CSP (SNAP) certification exam.

Registration has opened - Visit Upcoming Events !