TOTAL METRICS WWW NEWSLETTER JULY 1999

This months newsletter brings more news from COSMIC (Common Software Measurement International Consortium) as they are gearing up to launch their new method for sizing software projects. Organisations world wide, have registered for the COSMIC trials to test the effectiveness of this new method which is based on a refinement of the *Full Function Point Method* of functional sizing.

In order to ensure the success of these trials an Australian software vendor Windows by Design has offered a trial version of their software *"Hierarchy Master"* to all trial participants to enable easy recording, calculation and consistent storage and reporting of the functional sizes measured. The *Hierarchy Master* enables measurement of software using the Full *Function Method* and is specifically designed for developers of real-time and embedded software. We will be reviewing this revolutionary tool, released just this week, and discussing how it will benefit all project managers who need to accurately record and quantify the scope of their software projects to enable them to accurately estimate project resources and control scope creep.

We will also be looking at the latest world scene of Functional Size Measurement standards and how IFPUG is positioning themselves for acceptance within the ISO suite of standards.

Our key article looks at innovative ways of using functional size measurement to manage and control software projects, written by Pam Morris from Total Metrics in Australia and Paul Goodman from SMS in the UK. They investigate the importance and relevance of the word '*analysis*' in Function Point Analysis.

Pam Morris
Editor

CONFERENCES

- **The Australian Conference of Software Metrics – ACOSM '99 – November 11th and 12th 1999 in Melbourne Australia** – Software Metrics to take us into the new millenium. For more details email: asmavic@ozonline.com.au

- **IFPUG - New Millenium, New Metrics, New Orleans October 18 –22 in New Orleans USA** Presentations from Harvard Business School, IBM, AT&T the US Navy, Price Waterhouse Coopers and Computer Sciences Corporation. www.ifpug.org/conferences/conf.html

- **UKSMA Annual Software Metrics Conference 14 – 15th October 1999 in Bristol, UK**. The Key note speaker will be Norman Fenton, Professor of Computing Science at the centre of Software Reliability, City University, London and author of the book ' Software Metrics – a rigorous approach'. www.uksma.co.uk

- **Federation Of European Software Measurement Associations (FESMA)** Hamburg Germany 4th – 7th October 1999

www.ti.kviv.be/conf/fesma.html

- **Sixth IEEE International Symposium on Software Metrics Florida, USA 4th – 6th November 1999.** 32 papers including sessions on quality and productivity of Object Orientated Development, COTS software and technology evaluation. The conference is run in conjunction with ISSRE 99 International Symposium on Software Reliability Engineering November 1 –4.
  Register online : https://secure.computer.org/conf/ismet/register.htm

- **Quality Week Europe '99 (QWE'99) Brussels 1st – 5th November 1999**. The conference will bring together software quality professionals from thoughout the world to share, learn and discuss the latest issues on software quality. This year's theme is 'lessons learned' and aims to reflect the skills learned in the past few years and to take a proactive approach in applying these insights to future issues. More information can be found at: www.soft.com/QualWeek/QWE99/>>

- **EuroSPI'99 Pori School of Technology, Stockholm, Finland 25th – 27th October 1999**. The mission for this conference is to create a platform to exchange process improvement experiences aiming at return on investment. The Keynote speaker is Kim Caputo from Unisys, who is the author of CMM Implementation Guide: Choreographing Software Process Improvement published by Addison Wesley Longman. Register your interest online: http://www.bigfoot.com/~EuroSPI and receive a final conference program.

- **ESCOM (European software Control and Metrics Conference) jointly with the 3rd SCOPE (Software Certification Programme in Europe) conference Munich, Germany 18th – 20th April 2000**. The theme of the conference is "Controlling Software Projects: The Human Factor". It includes topics such as, Estimation, Sizing, Risk Analysis And Management, Software Metrics, Reliability, Modeling, Metrics Programs, Productivity Analysis, User Orientated Quality Specification, Product Evaluation And Certification, Usability Design And Evaluation. Workshop Seminars will be held April 17th. For registration of interest or submission of papers: Email: JoCowderoy@escom.co.uk.

Call for Papers:

ACOSM '99 - Australian Conference of Software Metrics –– November 11-12 1999 Melbourne Australia – is calling for papers that describe basic research, novel applications and experience reports relevant to software metrics. Papers should be submitted to: asmavic@ozonline.com.au . For more information visit the web site at: WWW.asma.org.au

UKSMA Annual Software Metrics Conference 14 – 15th October 1999 in Bristol, UK

– is calling for papers from those interested in presenting their experiences and findings at the conference. Send to UKSMA Programme, PO Box 27024, Edinburgh UK EH10 6WA or email: conferences@UKSMA.co.uk.

ICSSEA – Software and Systems Engineering and their Applications - 12th International Conference 8 – 10th December 1999 in Paris, France – is calling for papers from those interested in presenting their experiences and findings at the conference. Topics at the conference are a survey of tools, techniques, methods and practices for engineering complex systems in which software acts as both consolidator and integrator. The main issues relate to mastering development, integration, quality assurance and safety of software and systems. For more information email: rault@cnam.fr or visit the web site: www.cnam.fr/cmsl

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International Function Point Users Group (IFPUG) What's News?

As part of their new strategic direction, IFPUG has decided to change from their usual format of holding two conferences a year to only holding one conference in the third quarter and a 'workshop' session in the first quarter. The first of this series of workshops was held in the last week of April 1999 in New Orleans, USA.

The committee meetings held at that time had the following outcomes:

- **IFPUG Certification Exam**
  - The exam will be updated to incorporate the rule changes of Release 4.1 of the counting practices manual. It is planned that the new exam will be available from October 1999.
  - The IFPUG board has decided that certification will be for a 'release number' e.g. Release 4, rather than for specific upgrades to that release (e.g. Release 4.1). IFPUG plan to re-issue certificates to all certified counters that now state that they are certified to the Release 4 series rather than Release 4.0 specifically.
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  - IFPUG is investigating holding 'two level' certification exams similar to that held in the Netherlands by NESMA. I.e. The first level is as per the current exam where much of the emphasis is placed on knowing the theory embedded in the Counting Practices Manual. The 'second level' will be more practically based and will test the counters ability to accurately count a software specification.
  - Note: The Australian Software Measurement Association (ASMA) is planning to hold their next IFPUG certification exam on November 11th to coincide with their ACOSM conference in Melbourne. This exam will be for the 4.1 Release.

- **IFPUG Counting Practices Manual**
  - The Acrobat PDF version of the IFPUG 4.1 manual is available on the IFPUG Web site, for downloading by IFPUG members. The Microsoft WORD version was released in early June.
  - Copies of the new CPM 4.1 manual can be obtained from the IFPUG office.
    Note : Australian members of ASMA can obtain a copy from the ASMA administration office (asmavic@ozonline.com.au) or as part of their membership package re-subscribing.
  - Total Metrics is now offering two and three day courses in IFPUG 4.1 Function Point Counting Practices and a one day upgrade courses aimed at converting practitioners from 4.0 to 4.1. For more information about these courses please contact : training@totalmetrics.com

- **IFPUG Counting Practices Committee**
  - Pam Morris of Total Metrics represents ASMA on the IFPUG Counting practices committee (CPC) and attended the New Orleans meeting. Martin D'Souza, also of Total Metrics, has been invited to participate in the CPC and attended their July meeting in Michigan USA.
  - In New Orleans, the CPC decided to develop a series of 'addendums' to the new 4.1 Manual to provide practical advice on implementing the counting rules. The major areas to be addressed were

identification of logical files and record element types, distinguishing unique elementary process from variations in processes and how to correctly count data shared between applications. An overview of these topics will be presented at the CPC update at the New Orleans meeting in October 1999.

- A sub-committee was established to review changes to the 4.1 manual to investigate its conformance to the recently published ISO standard 14143-1:1998 for functional size measurement.

♦ IFPUG Memberships

- IFPUG are reviewing their current membership structure and the benefits to their international members. They plan to ensure that International IFPUG members are adequately compensated for not being able to easily take advantage of attending conferences.
- The new membership structure is similar to that initiated by ASMA, whereby members are offered a 'package' of products as part of the subscription fees.

♦ IFPUG Conferences

- The next IFPUG Conference is due to be held in New Orleans in the week starting 17th of October 1999.
- Confirmed speakers include Tom Gilb, Tim Lister and Paul Strassman, plus many others who will share their tips and experience in implementing software measurement in their organization.
- Workshops are planned to teach the newly released macro estimating "Workbook" produced by the Australian members of the International Software Benchmarking Standards Group (ISBSG).
- The location for the year 2000 Conference is yet to be confirmed but is rumoured to be in San Antonio, USA.
- Further information on the New Orleans conference is available by contacting the IFPUG office at +1 614 895 7130 (voice), or +1 614 895 3466 (fax), by email at ifpug@ifpug.org or by accessing the website at http://www.ifpug.org.

♦ IFPUG Academic Affairs Committee

- IFPUG members have long been asking the Counting Practices Committee to review the relevance of the Value Adjustment Factor in Function Point Counting rules. The Academic Affairs committee has supported a research project to investigate the current usage and relevance of the General Systems Characteristics. A paper summarizing the results of this industry survey is due for release at their October conference.
- A study on FPA and OO environments is currently being carried out. The survey questionnaire is available on IFPUG's WWW site. This is an opportunity for all users of IFPUG Function Point Analysis to participate.
- The academic affairs committee is actively seeking research projects to fund. Any member of IFPUG can propose such a project to the committee. A stipend of $200 to $2000 is available from the IFPUG to approved projects. This is an opportunity for University research participation.
- The academic affairs committee would like to publish a compendium of metrics related research papers and is looking for contributions, if you have references to metrics resource material, please contact IFPUG.

♦ Management Reporting Committee

- The committee has been busy preparing a document called 'Guidelines for Software Measurement'; some chapters are already available on the IFPUG WWW site.

ISO International Standards for Functional Size Measurement
IFPUG PLANS FOR ACCEPTANCE

The Plenary meeting for ISO/IEC Sub-committee 7 was held at Curitiba Brazil in May 1999. Pam Morris and Martin D'Souza from Total Metrics represented Standards Australia on Working Group 12 for Functional Size Measurement. Pam Morris is the WG12 convenor and project editor of 14143-2 and Martin D'Souza is the Secretariat of the group.

Outcomes from this meeting were to recommend to re-ballot Part 2 of the 14143 standard as a final committee draft. This part of the standard is used to check proposed functional size measurement methods (eg. IFPUG 4.1 could be one such method) conform to the requirements of a functional size measurement method as defined in the published part 1 of the 14143 standard.

Other parts of the standard (parts 3 and 4) will be re-balloted as preliminary draft technical reports.

IFPUG is planning to submit their functional sizing method to the rigors of approval within the ISO process. Their PAS submission is currently being balloted at the ISO/IEC/ Joint Committee 1 (JTC1) level. Voting is due to close in November of this year. If it can pass the stringent tests imposed by this method of submission then it will be able to be a full international standard within the next 2 years. Other functional size measurement methods e.g. Mark II and Full Function Points are planning to submit to the same approval process in November.

It may be noted that the Value Adjustment Factor (VAF) component of the IFPUG 4.1 rules currently prevents IFPUG 4.1 from conforming to the requirements of a functional size measurement method as defined in 14143-1:1998. IFPUG recognise that the VAF will need to be removed from their basic method for functional sizing before the IFPUG FPA method can be approved.

COSMIC
Trials for the new FSM Method set to go!

Members from five nations (UK, Australia, Netherlands, Canada and Finland) met in Curritiba Brazil in May to review the latest draft of their functional size measurement method and plans for its testing. This new COSMIC-FFP (Common Software Measurement International Consortium) method is based on the Canadian *Full Function Point* Methodology and has been specifically developed to address the functionality delivered by embedded and real-time applications and middle-ware software.

It is anticipated that the trials for testing the draft version of the COSMIC – FFP method will be held world wide in the final quarter of 1999. The objective of the trials will be to test if the new method is an effective size measure for input into productivity metrics and estimating models. About 20 organisations in seven countries have so far agreed to participate in the trials. If you are interested in finding out more about the COSMIC initiative then visit the WWW site: WWW.COSMICON.com or if you are interested in participating in the trials contact Pam.Morris@totalmetrics.com.

Total Metrics has scheduled training courses in COSMIC – FFP and the for September 1999.

The Australian Software Metrics Association goes to SEA!

The Australian Software Metrics Association (ASMA) has announced this week that they have entered into a formal liaison with Software Engineering Australia (SEA). They will now be known as both *ASMA /SEA- Metrics*.

ASMA has developed extensive international profile through its leadership of the International Software Benchmarking Standards Group (ISBSG), and provides it members with an extensive resource set of

products and services. The strategic alliance with SEA will provide ASMA with the infrastructure to distribute its products to the Australian software engineering industry.

Software Engineering Australia (SEA) is a recently established national network, with Technology Support Centres operating in each Australian State and the ACT, and a national body which co-ordinates the activities of the network to achieve national outcomes. The Australian Commonwealth government has funded it with the aim of increasing the competitiveness and the quality of outcomes from the Australian software industry. These objectives are similar to those of ASMA, and the SEA network is developing the infrastructure required to transfer software-engineering technology to the Australian software engineering industry.

Both organisations are excited about this liaison and recognise the mutual benefit in forming an alliance that will bring the complimentary strengths of each party together.

The first conference to be held by SEA / Metrics will be the Australian Conference of Software Metrics (ACOSM) on November 11th - 12th 1999 in Melbourne.

NEW PRODUCT RELEASE

HIERARCHY MASTERÔ

A first for successful measurement of embedded software

Jin do you want to insert text from your press release in this section

Since early 1999, *Total Metrics* consultants have been using the beta version of this tool at client sites, to measure embedded, real-time and telecommunications software. Our consultants have been very impressed by its capability to graphically represent the client's software project. This has allowed them to work with the client to interactively do 'what if' analyses to assist in project estimation and scope control, decision making. Results of scope negotiations can then be printed or displayed online. "For the first time, we can work with the client to graphically display the impact of change and quantify that impact, in a way that the client can appreciate its magnitude and cost".

For more information about *Hierarchy MasterÔ* contact: Admin@totalmetrics.com

KEY ARTICLE

Forgotten Aspects of Function Point Analysis

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This article contains material from both the International Function Point User Group Counting Practices Manual (version 4) and the UK Function Point User Group Mark II Counting Practices Manual. This material is reproduced with the permission of those organisations.

The title of this paper stemmed from a presentation at the International Function Point User Group (IFPUG) conference in the USA. A strong theme of that presentation, given by one of the authors of this article, Pam Morris, was simply that there is a very important word in the term "Function Point Analysis", namely "Analysis". Subsequent discussions between the authors and others have led to this article which we both hope will trigger some thought and response.

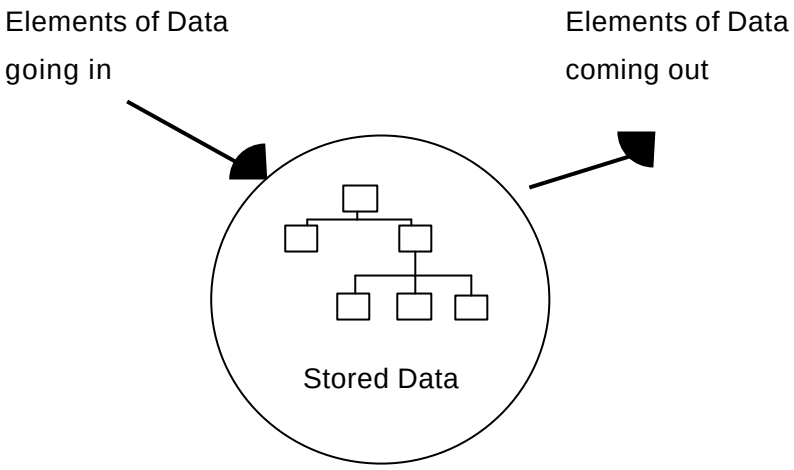
Generally, we tend to think of FPA as providing us with a size measure and the Function Point Index and when talking about the uses and benefits of FPA, we talk about the index and the size measure as being something that enables meaningful comparison of, for example, productivity across projects, systems and enterprises. Because of the observed relationship between size, in terms of the Function Point Index and effort in many organisations, we also concentrate much of our attention quite rightly on the use of FPA in cost estimation. These are the traditional uses of FPA.

Bearing in mind the term "Analysis", we wish to look at some of the fundamental principles of FPA and see if there are other uses.

When you think about FPA, what is the most important factor that differentiates this from other techniques in software engineering? It has to be that FPA views the system from the users' perspective; the result of applying FPA is the derivation of a measure of the "functional user requirements" (ISO Draft International Standard). Remember that point, FPA is based on the users' view rather than the developers' view.

Now how is this measure derived? We are going to talk in terms of new systems but much of what we will say applies equally to enhancement projects. The first thing we do is to take a view of the system as shown in figure 1.

figure 1



Essentially, this is how customers see computer systems. They put information in and they get information out and they recognise discrete groups of data, entities or files that the system will use and maintain. In fact, this process does not even need to be supported by a computer system. Think of the Dickensian picture of a clerk working in a counting house at the big, old, high desk with wooden pigeonholes to store data. **That business process can equally be represented by the model in figure 1**. Hold that thought also and we will return to it later.

The next stage in FPA is to model the users' functional requirements. In other words, we will uniquely express the general model given in figure 1. The way we do this is to break the process down through a number of layers. A system supports a business function, maybe accounting and this can be divided into a number of business areas. We could define a business area as a users' recognisable segment of a business function that, for business reasons, may be supported separately. An example may be end of year accounting.

If we keep decomposing our system, as we must if we are going to apply FPA, we reach something I will call the business operation level. A business operation can be thought of as a set of one or more activities which, when taken together, form a complete, user recognisable business procedure. In accounting, an example could be to complete the end of year tax return which is part of end of year accounting. Now, where is all of this leading us?

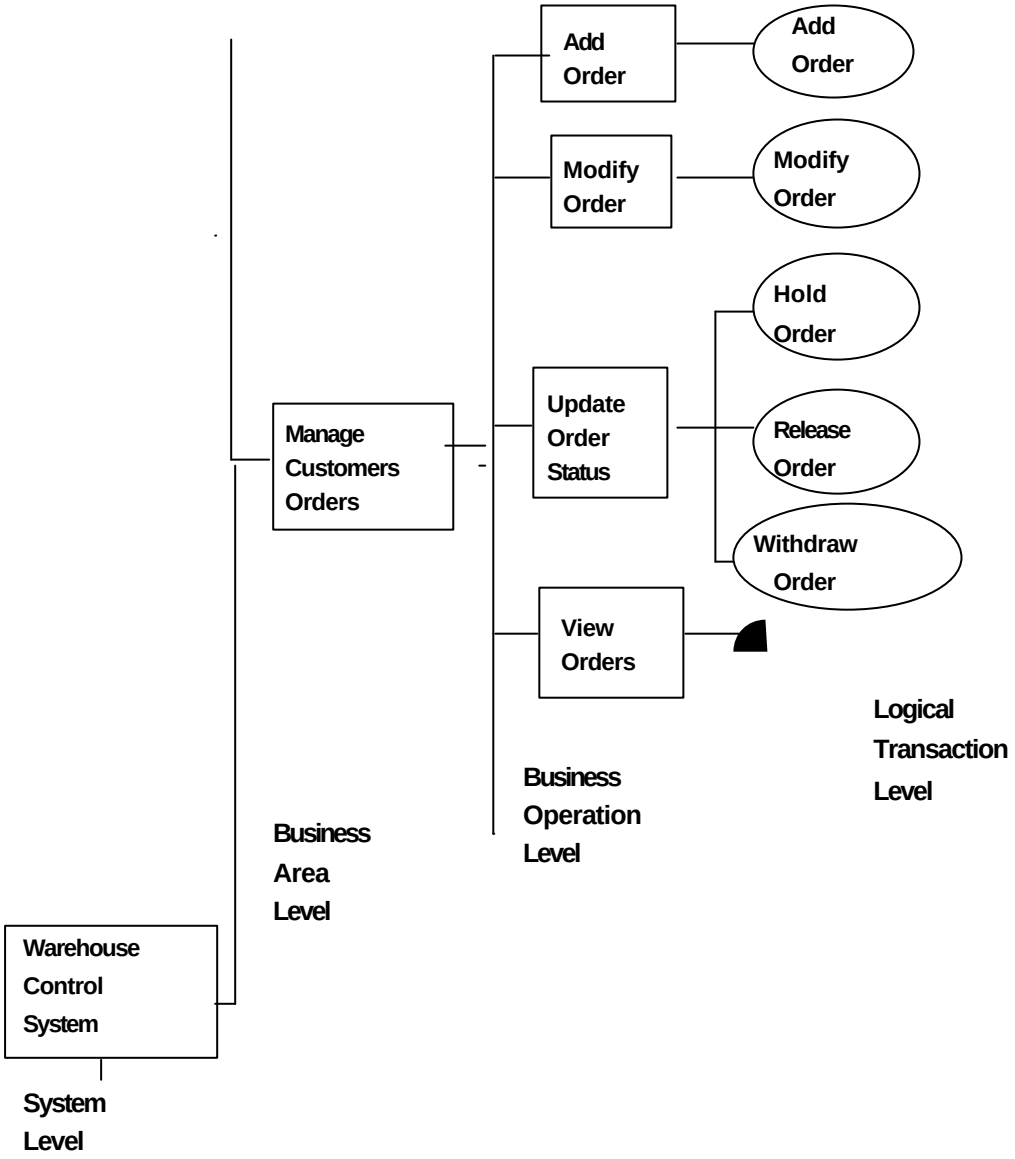
So far, we have taken a view of the business function that reflects the way people think about what is going on. Now we move slightly away from that view to more of a systems oriented view. Decomposing still further we reach the lowest level of user recognisable functionality. That is, "...the lowest level business processes supported by the system..." (UFPUG CPM).

And before going any further we have to digress. Some of you, seeing the source of that quotation will think that what we have said so far may relate only to Mark II FPA. Let me give you another quote and note the source, "...the smallest unit of activity that is meaningful to the end user of the

business..." (IFPUG CPM). The IFPUG CPM calls these "elementary processes", UFPUG call them "Logical Transactions". There are some differences in definition **but the spirit is the same.** We will stick with the term Logical Transaction for no better reason than the fact that the editor of this piece had it in the next diagram already and is a strong believer in re-use!

Having got down to the level of the Logical Transaction we have a functional decomposition of users requirements that define a process that may be supported by a computer system. Figure 2 shows this for part of a warehouse system.

Figure 2



Once we reach the point of sizing Logical Transactions by identifying information that enters and leaves the process and the data stores acted on, whether you use the IFPUG or the Mark II approach, you have not just a means of deriving the Function Point Index, **you have a pure expression of the user's functional requirements**. Think about that for a moment. In order to apply FPA you have, for example, defined not the report layouts but the information that will be

contained in an output which may be a report. That is all you need for FPA. In fact, one of the problems FP analysts have is that so called requirements specifications often contain lots of unnecessary information; express how the system will do things rather than what it will do and are incomplete.

This use of FPA to define concise yet rigorous specifications of requirements can lead to a fuller understanding of what is going to be undertaken much earlier than we in the IT industry are used to. The benefits of this are immense, as we all know the increased cost of fixing things later. Also, with the increasing use of third party software development and support, well-defined specifications that can be sized naturally become the basis for contracts. Pity the poor project manager who has been signed up to a fixed price contract only to find that half the requirements have been misinterpreted or even missed altogether!

There is a further ramification to the analysis aspect of FPA. Every time you perform a Function Point Analysis, you are engineering, often reverse engineering, a form of requirements specification from available information. You are, in effect, duplicating the requirements specification process. Given that the specification process is still regularly cited as the biggest problem in software engineering today raises a question.

Can Function Point **Analysis** be used as the solution to the problem of requirements specification? From experience, we know that the answer is a partial yes and that the part of the problem it addresses is the most significant, that of deriving the functional requirements. Identifying constraints etc. can easily be added to the process of FPA.

There is then the fact, we suspect, that FPA can be used to size any business function whether or not that function is supported by a computer system. That means it could be used to size a business in terms of functional requirements. To be able to do this implies that a model of the business needs to be constructed that is amenable to the application of FPA and this can be done in the same way that a model of the users logical requirements is derived in order to apply FPA to an IT based system. This business model can supply valuable information about the business. After all, how many senior managers have any idea what the totality of their business function is? If it was done then a logical next step would be to do the same thing to the systems that support the business function. In other words, from the physical systems that exist, reverse engineer the functional requirements (we've deliberately dropped the word user here) that model what the system(s) do. Then compare the two.

Pie in the sky? No, this has already been done in at least one Australian organisation of some size and what did they find? Whole areas of user functional requirements, i.e. business functionality, that was unsupported. Massive duplication of supported functionality, implying significant maintenance costs that were unnecessary. Might it be worth thinking about applying FPA to your business in this way? Saving millions is a powerful incentive!

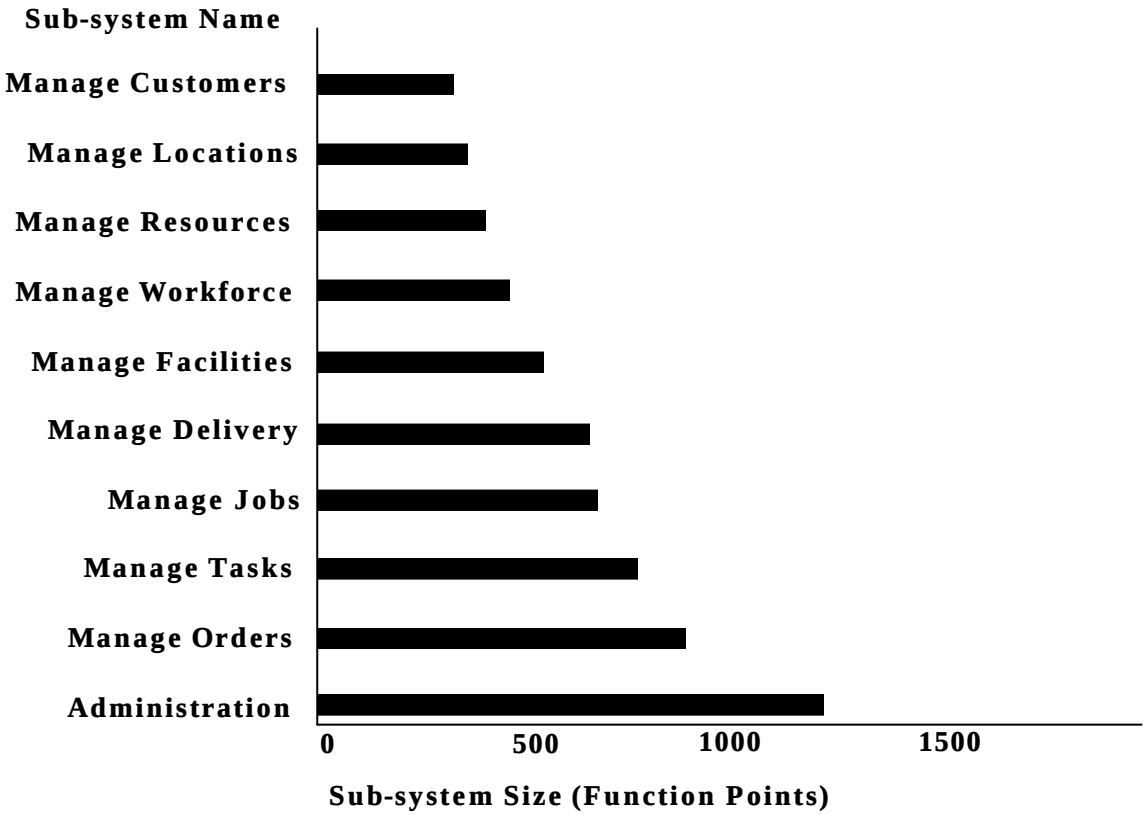
So far, we have looked at two "forgotten" aspects; the model FPA provides for functional user requirements and the fact that it can be applied to business processes as well as the systems that support those business processes. Let us now consider a third aspect. Taking one step back from the Function Point Index we have the Logical Transactions, or elementary processes. These provide us with a different view of the job in hand, the job of building the system to support the functionality requested. Perhaps there is something in this that could be used to help the project managers.

Many of us have been asked to report progress in terms of "percent complete". This is sometimes expressed in terms of components built vs. components to be built; actual lines of code delivered vs. estimated lines of code to be delivered; actual effort consumed vs. estimated effort still to be consumed (which seldom decreases!) or various combinations of these. These measures have serious defects. They tend to be meaningless until quite late in the projects life, they are often based on estimated values and, if project managers are honest and we have both been members of this much maligned breed so we again speak from experience, the reports are often best guessed.

Yet with the model we have in FPA, at the Logical Transaction level, is practically ideal for progress monitoring. Once we have the model, expressions such as 50% of our Logical Transactions have now been signed off review in technical design, or even 25% of the total of our total Function Point Index have now been signed off review in technical design are meaningful. The model, the thing that has enabled us to do my FPA, is not subjective (despite what some people claim, this has been proved at least to the satisfaction of most, by more than one study); is available early in the life cycle and is not an estimate. It is true that the Function Point Index may change but only if the requirements change. The old chestnut that "the user doesn't know what they want until we have built or at least designed the system" is a cop out that should be rephrased as "we (IT) are lousy at talking to our customers to find out what they want".

We do not even have to stop with progress monitoring. The Function Point model can help us manage our projects better. Each Logical Transaction has an FP index of it’s own. This can be seen as a measure of how difficult it is going to be to build, not for small variations in size but certainly for larger variations. We can even assess whether it is entity heavy or input or output heavy. Given this information it may make more sense to give specific transactions to specific people with specific skills. Of course, when we start to group transactions to the business operation level, that is clusters of Logical Transactions or elementary processes, this management approach can make even more sense.

Figure 3



Where would you put your more experienced staff?

We firmly believe that we have only started to scratch the surface as far as the way in which we use FPA is concerned. Perhaps what we have called the "forgotten aspects" are really "undiscovered uses". As with many things, if we look at the fundamental principles of FPA and try to concentrate less on what we currently use it for, those principles may lead us to those undiscovered uses.

If you are currently using FPA in unorthodox ways or would like to talk these ideas through in more detail with a view to implementing them, the authors can be contacted by email, telephone or fax.

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THOUGHTS WORTH THOUGHT

If you don't stand for something,
You will fall for anything

He who loses wealth loses much
He who loses a friend loses more
But he who loses courage loses all

To avoid criticism
Do nothing, say nothing and be nothing

Great minds discuss ideas
Average minds discuss events
Small minds discuss people

Good reputation is precious
Good character is priceless

The true measure of a person is
Not what we get but what we give.

A reputation once broken may be repaired.
But the world will always keep its eye on the spot where the break occurred.

He who deliberates fully before taking as step will spend his entire life on one leg.

Giving Praise is much like giving love. The giver is usually the most benefited. He casts bread upon the waters and often gets back cake.

Lifes unfailing boomerang
As you sow, shall you reap.