The Cost of Speed

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1 BACKGROUND

Many organisations are seeking to optimise their processes to deliver more functionality, faster AND at a lower cost. However, the objectives of faster delivery and lower costs; may be in contention. Although an IT department might respond to change requests quickly, as a result it will deliver annually less software at a significantly higher cost per unit of functionality than if change requests were more carefully considered and consolidated.

Since quantitative measurement of IT output (function points delivered) is frequently not monitored, business sponsors are often unaware of the significant decrease in IT cost effectiveness resulting from their decision to implement short sharp projects. This article looks at an Australian organisation that, after reviewing the costs to deliver functionality of their small projects, has evaluated the cost versus the business value of **'faster time to market'** and revised their delivery strategy to optimise both cost effectiveness and speed of delivery.

2 CASE STUDY

Over the last 2 years the organisation's business sponsors had requested their internal IT department be more responsive to external business needs and to deliver updates to their software within 3 months of a change request being logged. These updates were typically in the range of 10 - 40 function points. (Where 30 fps of functional change would be equivalent to adding a new field to customer information, changing the maintenance and reporting transactions on customer details to include the new field). The business was pleased with the **improved turn-around time** but the IT project teams noticed that these new micro projects consumed nearly all of their resources so that the larger more strategic projects were being held back.

In order to assess the true costs of this new approach to prioritising projects, the organisation measured the output productivity of 50 enhancement projects over the past 4 years. The they compared the productivity and cost per function point of delivering functionality in larger projects (>250 fps), to delivering functionality in small isolated projects (<50 fps). Their results are displayed in the graphs below and are compared to the industry data, for the same development environment, from the International Software Benchmarking Standards Group (ISBSG) (www.ISBSG.org).

The ISBSG reports productivity as "PDR" (Project Delivery Rate) in hours per function point delivered. Therefore when interpreting the graph below you need to remember that **the lower the PDR the higher the productivity**. i.e. The more hours to deliver a function point of project functionality the less productive the project.

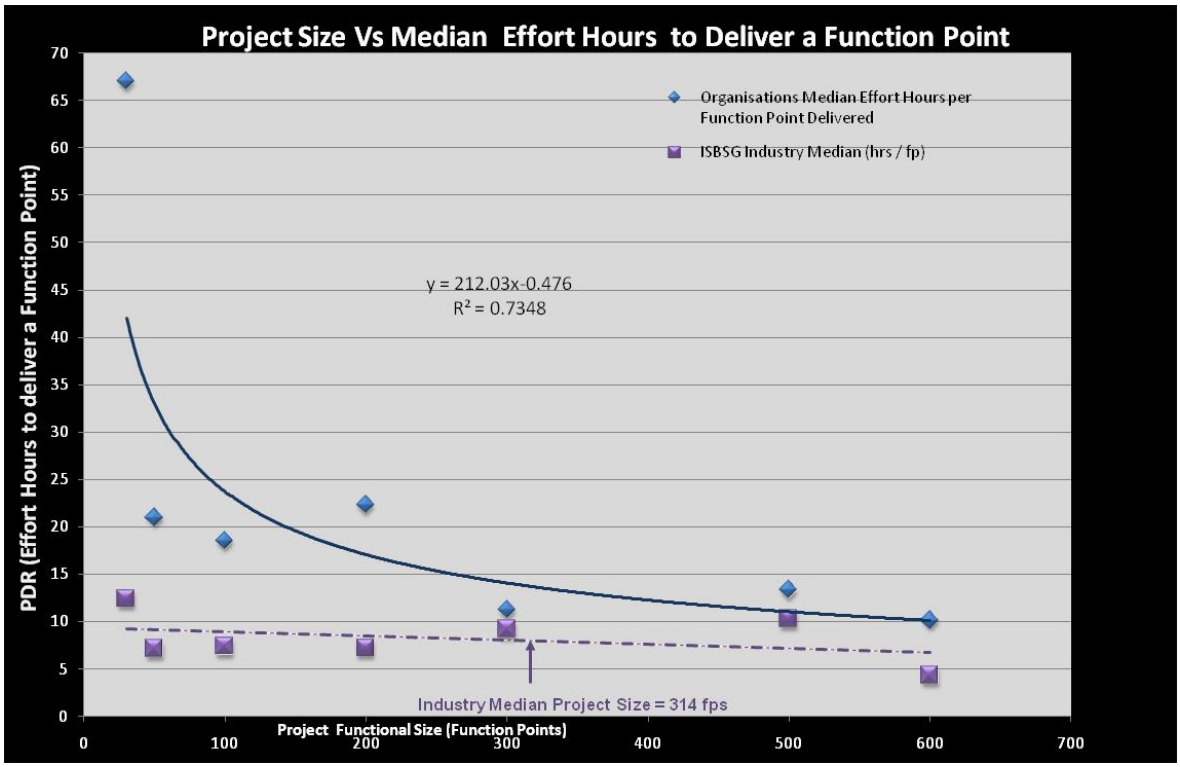

Figure 1: Projects – Project Size versus Hours per FP to Develop

The *size* of the 50 projects analysed varied 50 fold over the 4 year period measured. The organisations data showed a strong correlation between PDR and project size. As project size decreases, the PDR increases exponentially[1]. i.e. Their project productivity and cost effectiveness decreased exponentially as project *size*

[1] (R^2=0.74)

decreases. **Smaller projects were costing 5 times more to deliver a function point than if the changes were implemented as part of a larger project**.

However they found that, once the project size reached around 300 fps (i.e. close to the industry median project size of 314 fps) the PDRs achieved were consistently within Industry median values (10 to 12 hours per fp).

This inverse relationship between Project size and PDR is not a phenomena exhibited in the industry data which shows only slight productivity improvement as projects move from 30 fps to 300 fps.

The organisation had been implementing process improvement initiatives, and benchmarking their productivity gains, for the past 4 years. They had achieved significant improvements up until they decided to implement smaller projects. In the last 2 years 75% of their projects were smaller than 200 fps. They discovered that **as projects decreased in size the variance of their PDRs increased** (up to 500% for small projects of less than 50 fps). See Figure 2. This unpredictability had resulted in their budget estimates for smaller projects being unreliable. Previously, using functional size as input to their project estimates, they had been able to accurately estimate the costs of larger projects within $\pm$ 15%.

The wide variances in productivity exhibited by the small projects were also masking any improvements that the project teams had been able to make to the development process.

The analysis of the organisation's data indicated that there was something unique about their development process that had a negative impact on the productivity of small projects. This was not found in comparable industry data. Further investigation found that the rigor and resource overhead on their development **processes had not been customised for their micro projects**. These were required to produce the same detail of documentation and undergo the same rigorous system and regression testing as projects that were 100 times larger.

The organisation has since worked with the business to review how projects are prioritised and consolidated. Their development processes have been customised to suit small projects so as to optimise their cost effectiveness.

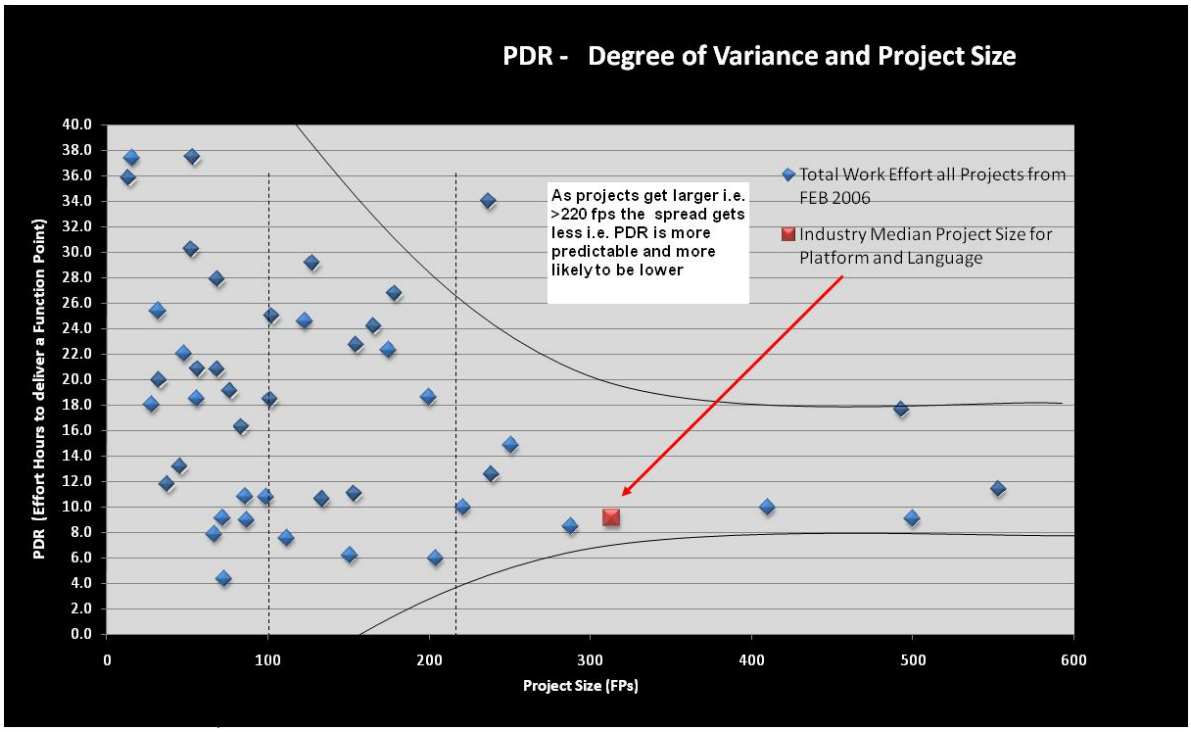

Figure 2: Projects – Productivity Variance decreases as Project Size ~ 220 fps

3 SUMMARY

Whilst, the project teams had, over two years, been expressing an opinion that the new way of working was inefficient, IT management and the business only reacted when the fact of a 500% cost increase was proven and presented.

The organisation has now been able to satisfy both objectives of: faster turn-around time of change requests and more cost effective software delivery, but they were only able to **identify and prove the problem by monitoring their project productivity**. They did this by measuring the functional size of every project and implementing a formal process to track development effort. This highlights that the key to making informed decisions is to have objective data i.e. "*without measurement you are only another person with an opinion"*.

Does your organisation know what it is costing to develop a function point, and are you more or less cost effective than industry? Perhaps you need to think about implementing Measurement and Analysis processes within your IT area to help contain your growing IT costs and to communicate effectively with your business sponsors.

4 ABOUT THE AUTHOR

Pam Morris

Pam is the CEO of Total Metrics, an Australian based organization that uses software measurement to bridge the gap between IT and the business. In 2006 Pam was awarded the Australian ITP Lifetime Achievement Award for her services to the IT Industry. In 2007 she was elected as Vice President of the International Software Benchmarking Standards Group (ISBSG) and the co-author of their Benchmarking Standard. She is the ISBSG liaison for the Australian Metrics association QESP. She represents Standards Australia as the international project editor of the ISO standard 14143-1 and 2 for Functional Size Measurement. She was the international convener of ISO/IEC/WG12 group developing FSM standards from 1997 to 2004 and plays an active role internationally in the development of measurement standards Pam was a member of the International Function Point User Group (IFPUG) Counting Practices Committee from 1993 to 2000 and continues to be a reviewer of IFPUG documents. She is a member of the COSMIC-FFP Core Group and assisted in the development of the COSMIC-FFP FSM method. She has been an IFPUG Certified Function Point Specialist (CFPS) since 1994, and a COSMIC Certified Practitioner and a Certified Software Measurement Specialist (CSMS Level 3) since 2006. In 2007 Pam was invited to be an international expert partner of the Chinese Software Benchmarking Standards Group. She is the principal designer of the Total Metrics internationally renowned Function Point counting tool – SCOPE and a Certified Investment Management Facilitator.

Pam is a regular guest speaker on the topic of software metrics at numerous international conferences in the USA, China, Japan, India, South Korea, New Zealand, Germany, South Africa, Spain, Switzerland, Sweden, Italy, Brazil and the UK.

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