Getting more ‘Bang’ for your ‘Buck’ from Function Point Counters

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Pam Morris Profile

- CEO - Total Metrics Australia
- Member of the IFPUG Counting Practices Committee 1993 - 2000
- International Workgroup convenor and project editor ISO/IEC 14143 Functional Size Measurement Standards
- Executive Member of the Australian Software Metrics Association (ASMA)
- Core project member COSMIC

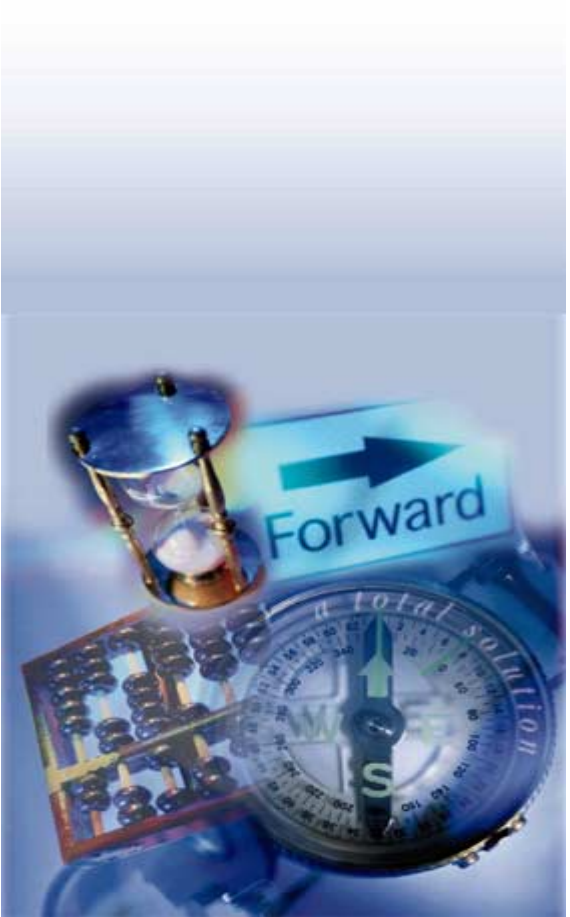
What is the ‘best’ answer?

The functional size of the ***Leave Register*** Application is:

1. **236** function points

2. around **250** function points

3. a **small to medium** application (ie between 200 to 500 function points)



Which Counter did the 'best' count?

Three counters counted the *Leave Application*:

1. Peter, documented every counting decision, cross-referenced all files to transactions and counted all DETs and FTRs **(Error range = ±10%)**

   → 2 days counting effort = $2000

2. Susan, counted all the files and transactions using the industry averages for the transaction and file complexity. **(Error range = ±15%)**

   → 1/2 days counting effort = $500

3. David just counted the logical data groups and multiplied by 31. **(Error range = >±20%)**

   → 1 hours counting effort = $125

TOTAL METRICS

The 'quality' of the count *result* (accuracy) and its *documentation* (completeness) is relative to the *purpose* for which the count will be used!

Plan a count so that its outcome is fit for purpose!

Common 'purposes' for Function Point Counts

- **Strategic Uses**
  - Software Portfolio Assessment & Evaluation
  - Performance Measurement
  - Benchmarking
  - Process Improvement
  - Planning Support Resources & Budgets
- **Tactical Uses**
  - Requirements Evaluation
  - Estimating & Quoting
  - Project Tracking & Control
  - Evaluation of Re-work
  - Evaluation of Packaged Software

What we need vs what we can get!

Purpose for Count

Count Size

Count Documentation

Input Resources

Count Process

Output Results

Software Specification

Subject Matter Expertise

Function Point Counter

FPA Tools

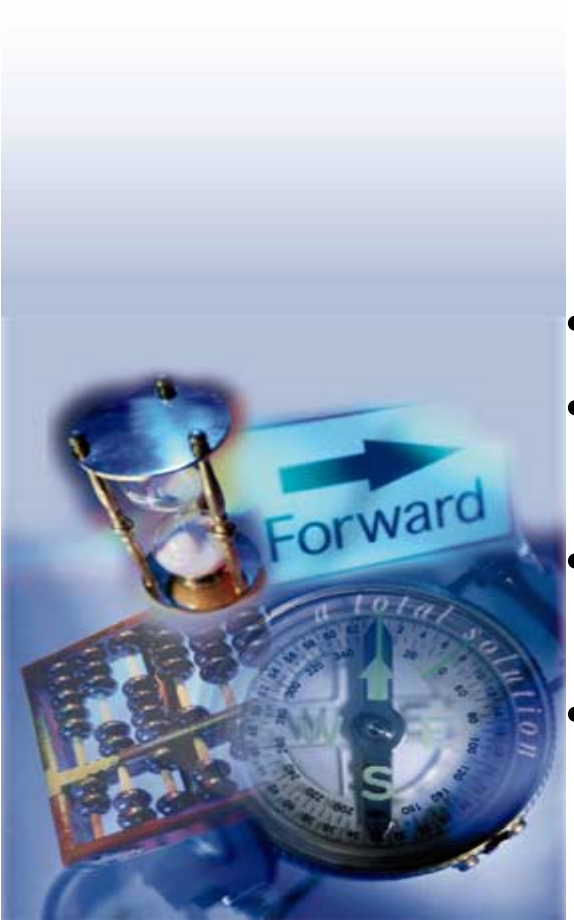
TOTAL METRICS

The 'quality' of the count *result* is driven by the *purpose* of the count but ultimately controlled by the 'quality' and 'quantity' of the *Input Information, counting tools and personnel used*

Provide resources to a count that are consistent with the outcome required!

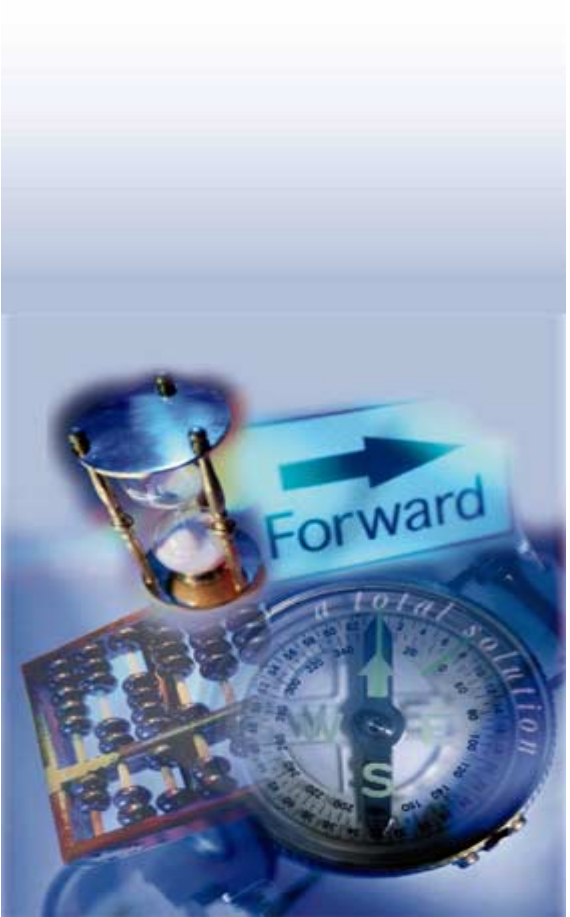
Planning a Function Point Count

- Assess
  - Budget and Schedule constraints for count
  - Purpose for which the outcome will be used
  - Quality of Input resources to the Count
    - software documentation
    - applications experts
    - counters
    - tools
- Predict the approximate size of the software
- Determine Quality of ‘desired’ Outcome versus ‘likely’ Outcome
- Get agreement from Sponsors on Count Strategy that will produce the planned outcome
- Map the strategy to the appropriate **‘Count Level’**



What do we Mean by 'Levels of Counting'

Standardized descriptions of exactly how the count will be conducted and its deliverables.



Defines Count:

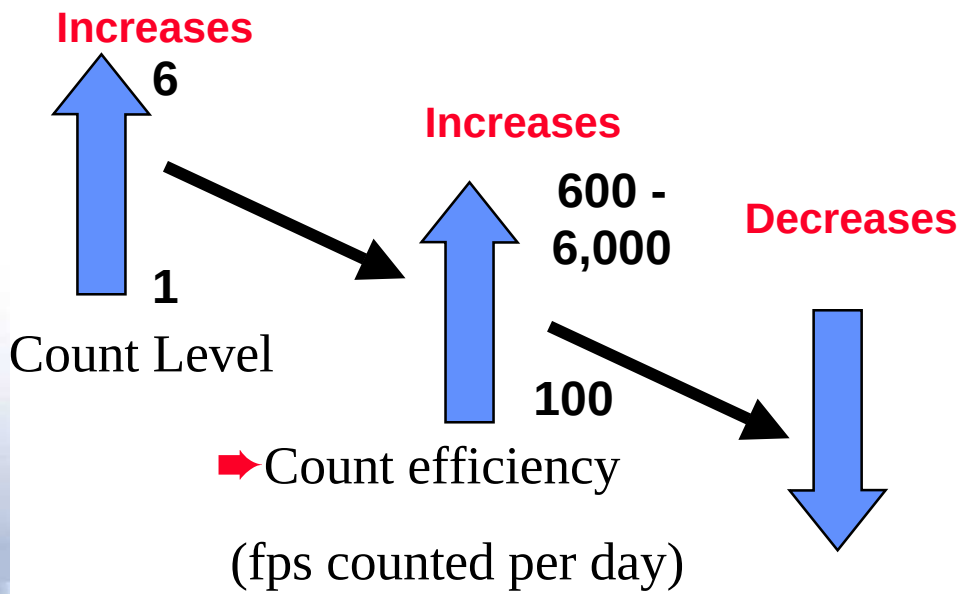
- level of detail
- type of count documentation
- extent of comments and notes
- maintainability
- valid uses
- error margin
- counting rates
- benefits and limitations
- input requirements

TM Definitions of 'Levels of Counting'

- LEVEL 1 = Detailed Linked and Labelled Count
- LEVEL 2 = Detailed Linked Count
- LEVEL 3 = Detailed Count
- LEVEL 4 = Default Complexity Count
- LEVEL 5 = Rough Count
- LEVEL 6 = Size Approximation.

Download full details of Count Levels from Total Metrics WWW Site - WWW.Totalmetrics.com

‘Levels of Counting’



- Count efficiency

(fps counted per day)

- count recording
- accuracy
- quality specifications
- maintainability
- count cost
- count effort
- count usefulness

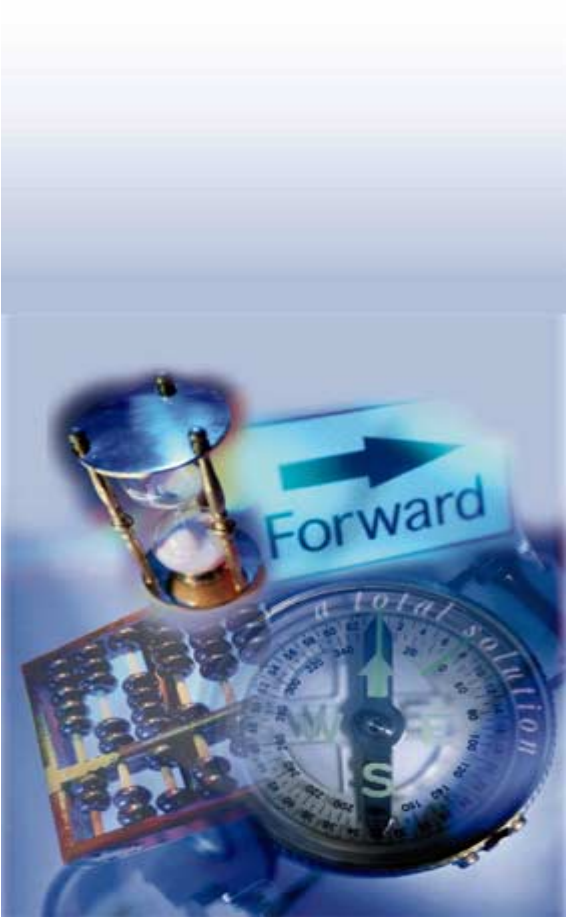
LEVEL 1 - Detailed Linked and Labelled Count

- ✔ application boundary
- ✔ all files and transactions uniquely identified, classified into type
- ✔ complexity (*actual numbers of DETs and FTRs are identified*)
- ✔ files and transactions are cross-referenced
- ✔ explanatory notes
- ✔ physical files and the logical files cross-referenced
- ✔ explanatory notes also link files and transactions to relevant documentation
- ✔ all agreed labels are attached
- ✔ uses *FPA* software repository tool.

LEVEL 1 - Detailed Linked and Labelled Count

Level 1 Count Attributes

- ✔ very detailed
- ✔ easily auditable
- ✔ accurate (within the limits of the FPA technique +/- 10%)
- ✔ very well documented
- ✔ easily maintained.



LEVEL 1 - Detailed Linked and Labelled Count

Best suited for Purposes of:

- ✔ benchmarking projects (new development and enhancement)
- ✔ detailed estimates
- ✔ project tracking
- ✔ baseline model for enhancement project counting
- ✔ Metrics reporting

LEVEL 1 - Detailed Linked and Labelled Count

Limitations:

- ✔ very time intensive – counting rates around 100 to 200 fps per day
- ✔ requires very skilled counters
- ✔ few counters are willing to invest the effort
- ✔ rarely cost effective for large, legacy application baseline counts.

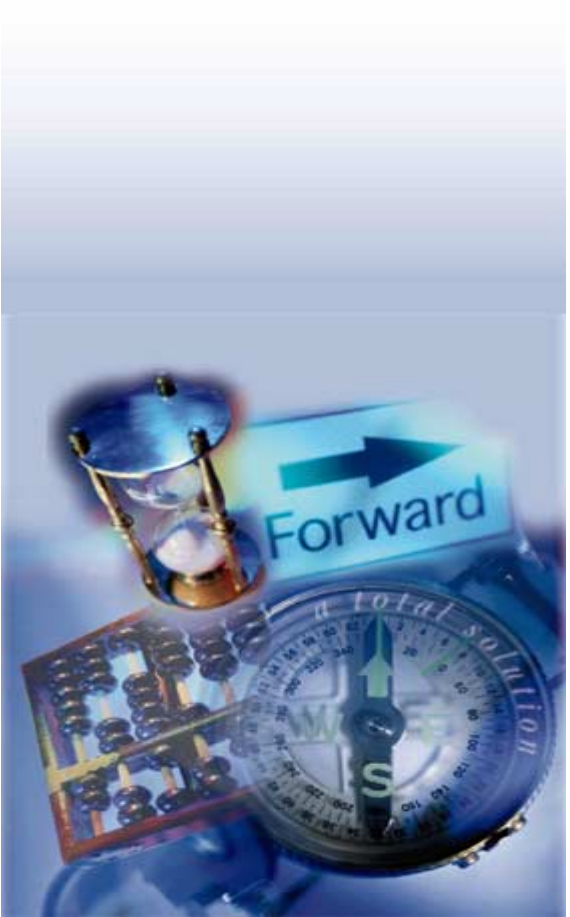
LEVEL 1 - Detailed Linked and Labelled Count

Prerequisites:

- ✔ high quality system documentation
- ✔ logical data model
- ✔ available experienced system experts.

Level 1 - Detailed Linked Labelled Count

Example: Government contract based on fixed price dollars per function point contract *For details see: www.mmv.vic.gov.au/southernscope*



Step 1 - Requirements Specification - Level 4

- suppliers to bid based on $/fp

Step 2 - Functional Specification - Level 1

- auditability and mutual agreement on size
- enables measurement of scope changes

- **Result = a count that is verifiable, auditable, traceable and able to be used as a basis for fixed pricing.**

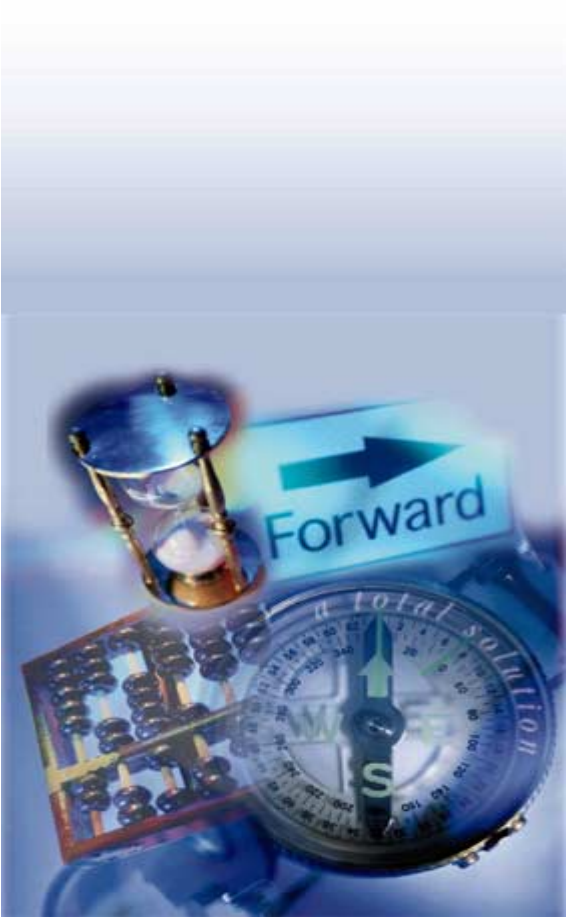
LEVEL 3 - Detailed Count

- ✔ application boundary
- ✔ all files and transactions uniquely identified, classified into type
- ✔ complexity (*ranges within matrices are recorded*)
- ✗ files and transactions are cross-referenced
- ✔ explanatory notes
- ✔ physical files and the logical files is documented. cross-reference
- ✗ labels are attached to relevant transactions
- ✔ uses a FPA software repository tool.

LEVEL 3 - Detailed Count

Level 3 Count Attributes

- ✔ very detailed
- ✔ easily auditable
- ✔ accurate (within the limits of the FPA technique +/- 10%)
- ✔ very well documented
- ✔ easily maintained.



LEVEL 3 - Detailed Count

Best suited for Purposes of:

- ✔ benchmarking projects (new development and enhancement)
- ✔ detailed estimates
- ✔ project tracking
- ✔ as detailed baseline model for future detailed enhancement project counting
- ✔ Metrics reporting

LEVEL 3 - Detailed Count

Limitations:

- ✗ time intensive – counting rates from 200 to 300 fps per day
- ✗ not really cost effective for large, legacy application baseline counts

LEVEL 3 - Detailed Count

Prerequisites:

- ✔ good system documentation
- ✔ data model if possible
- ✔ access to system experts.

Level 3 - Detailed Count

Example: Evaluation of supplier quotation for planned project that exceed clients estimated budget by 300%

Reason for NOT doing a detailed Level 1-2 count

- not cost effective
- time constraints

Result

- Estimates confirmed suppliers quotation

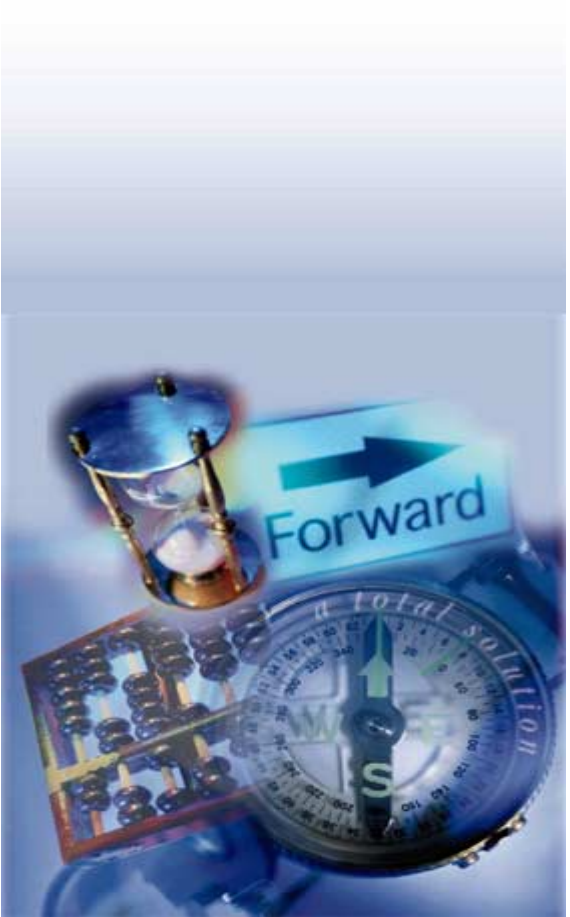
LEVEL 5 - Rough Count

- ✔ Application boundary is defined
- ✔ **functional decomposition (3-4 levels only)**
- ✔ **transactions and data functions 'tallied' from menus**, menu access paths, file lists, screen lists, report lists, application boundary
- ✔ diagrams, system interface documentation
- ✔ assumptions documented in count report.
- ✔ count is recorded and reported using a software repository tool.

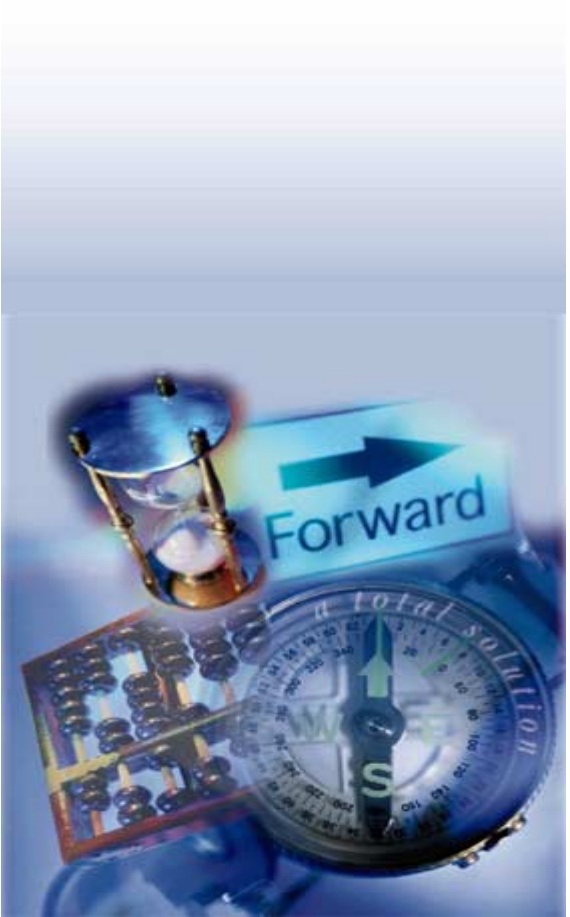
LEVEL 5 - Rough Count

Level 5 Count Attributes

- ✔ Low detail
- ✔ less accurate (± 20 - 25%)
- ✔ documented (issues and assumptions)
- ✔ 'Skeleton' on which enhancement counts can be built
- ✔ needs to be refined over time



LEVEL 5 - Rough Count



Best suited for Purposes of:

- ✔ portfolio baseline assessment
- ✔ benchmarking support ratios
- ✔ as a baseline model for future enhancement project counting
- ✔ cost effective for large, legacy application baseline counts

LEVEL 5 - Rough Count

Benefits

✔ very efficient – counting rates can exceed 750 fps per day

✔ cost effective for large, legacy application baseline counts which have very little enhancement.

- **Limitations**

✗ not very accurate

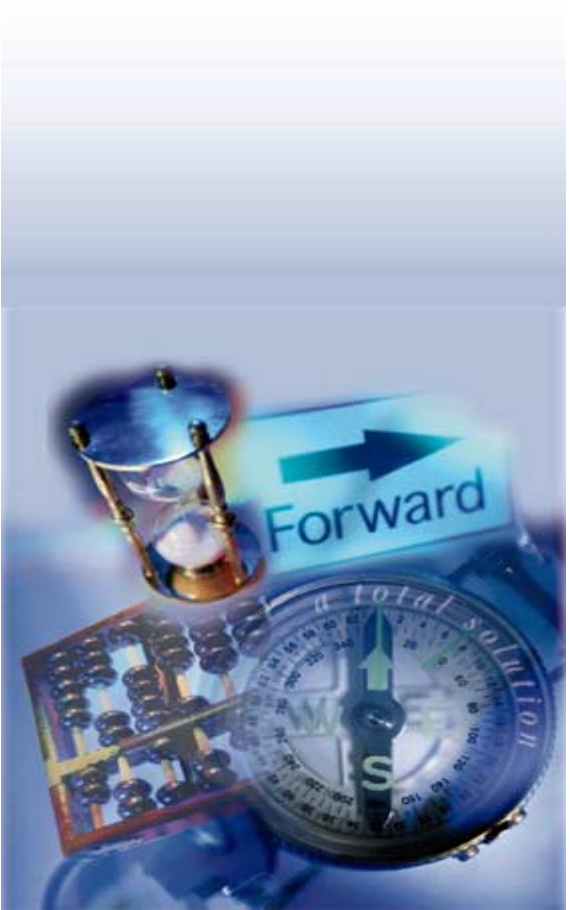
✗ incomplete

LEVEL 5 - Rough Count

Prerequisites:

- ✔ summarised system documentation
- ✔ full-time access to system experts

Level 5 - Rough Count



Example: Establishing Portfolio Size of a Large Cell Phone Billing Application for outsourcing contact

Reason for NOT doing a detailed Level 1-3 count

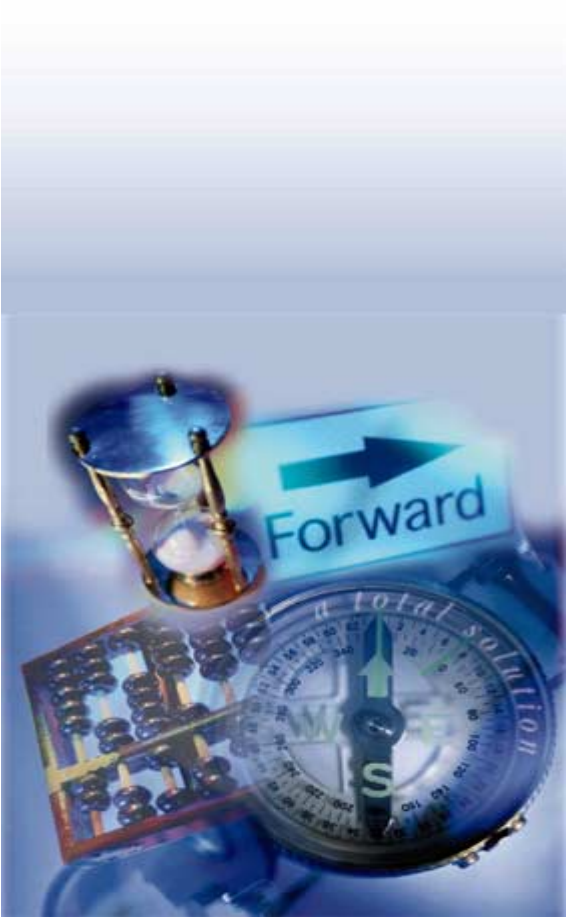
- contract time constraints
- 24 effort days to count
- Low documentation, no data model, good experience with application
- budget constraints on count

Results

- Counted in 7 days at 7,800fps (±15%)
- may be refined over time
- Contract signed on time

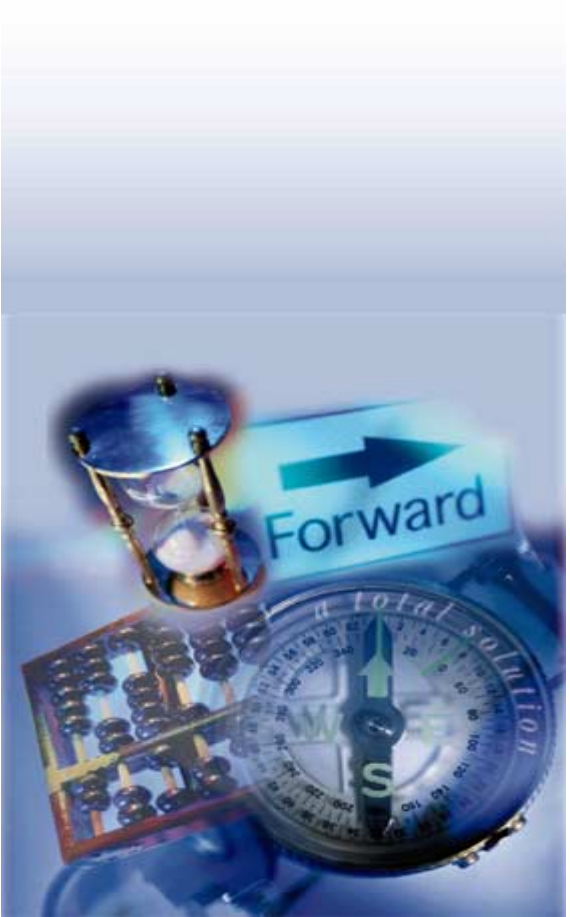
LEVEL 6 - Size Approximation

- ✔ size estimate reported in unadjusted and / or adjusted function points
- ✔ assumptions documented in report.



LEVEL 6 - Size Approximation

Level 6 Count Attributes



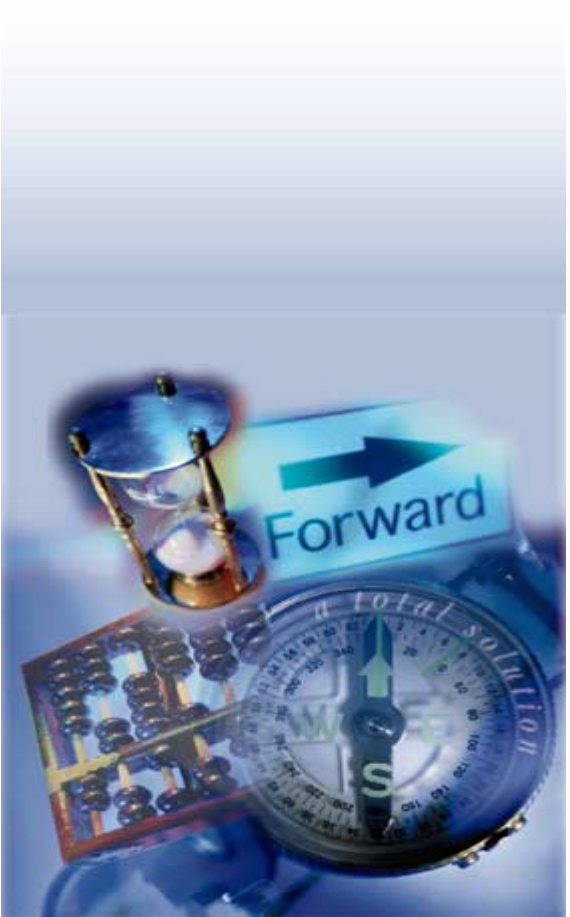
- ✔ very little detail –size results only
- ✔ accuracy historically has been demonstrated to be within (usually ± 20% may be up to ±200%)
- ✔ completed questionnaire plus brief report on result
- ✔ not maintainable, snapshot of size only (needs to be redone if anything changes)

LEVEL 6 - Size Approximation

Best suited for Purposes of:

- ✔ portfolio baseline assessment
- ✔ benchmarking support ratios
- ✔ asset valuation
- ✔ estimates of counting effort
- ✔ project scoping
- ✔ most cost effective for large, legacy applications, which do not need their counts maintained

LEVEL 6 - Size Approximation



Benefits

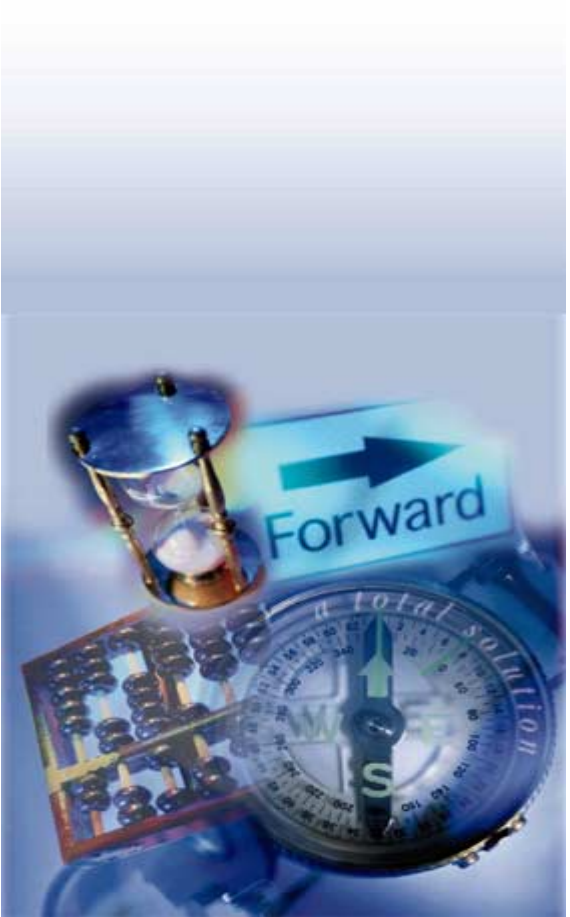
- ✔ very efficient – most applications can have their size estimated within half a day
- ✔ very cost effective for large, legacy application baseline counts which have very little enhancement

Limitations

- ✗ not very accurate
- ✗ non-maintainable

LEVEL 6 - Size Approximation

Prerequisites:



- ✔ summarised system documentation
- ✔ full-time access to system experts (for the duration of count)

Level 6 - Estimated Count

Example: Establishing whether supplier was providing value for money

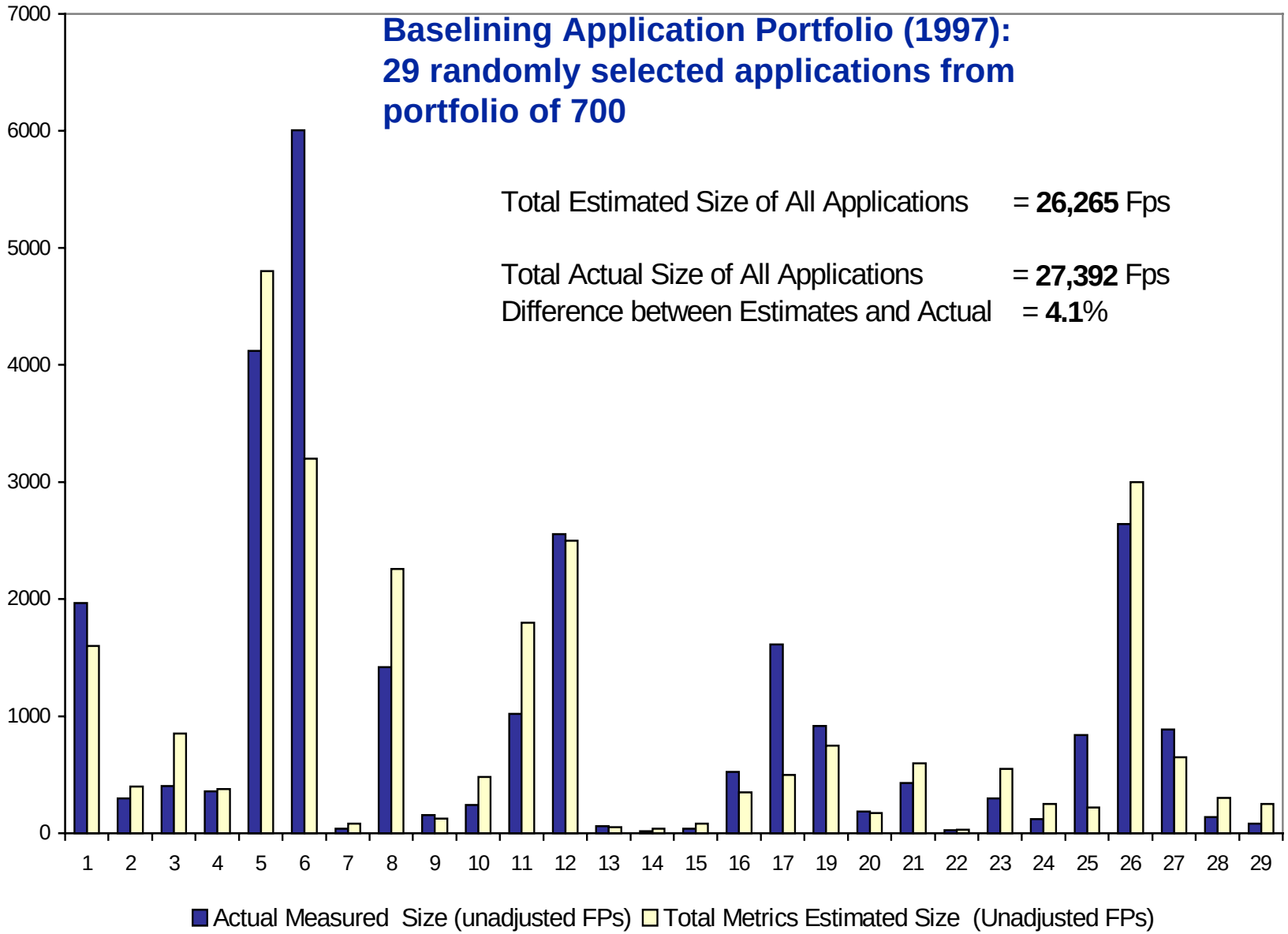
Reason for NOT doing a Level 1-5 count

- severe time constraints
- budget constraints

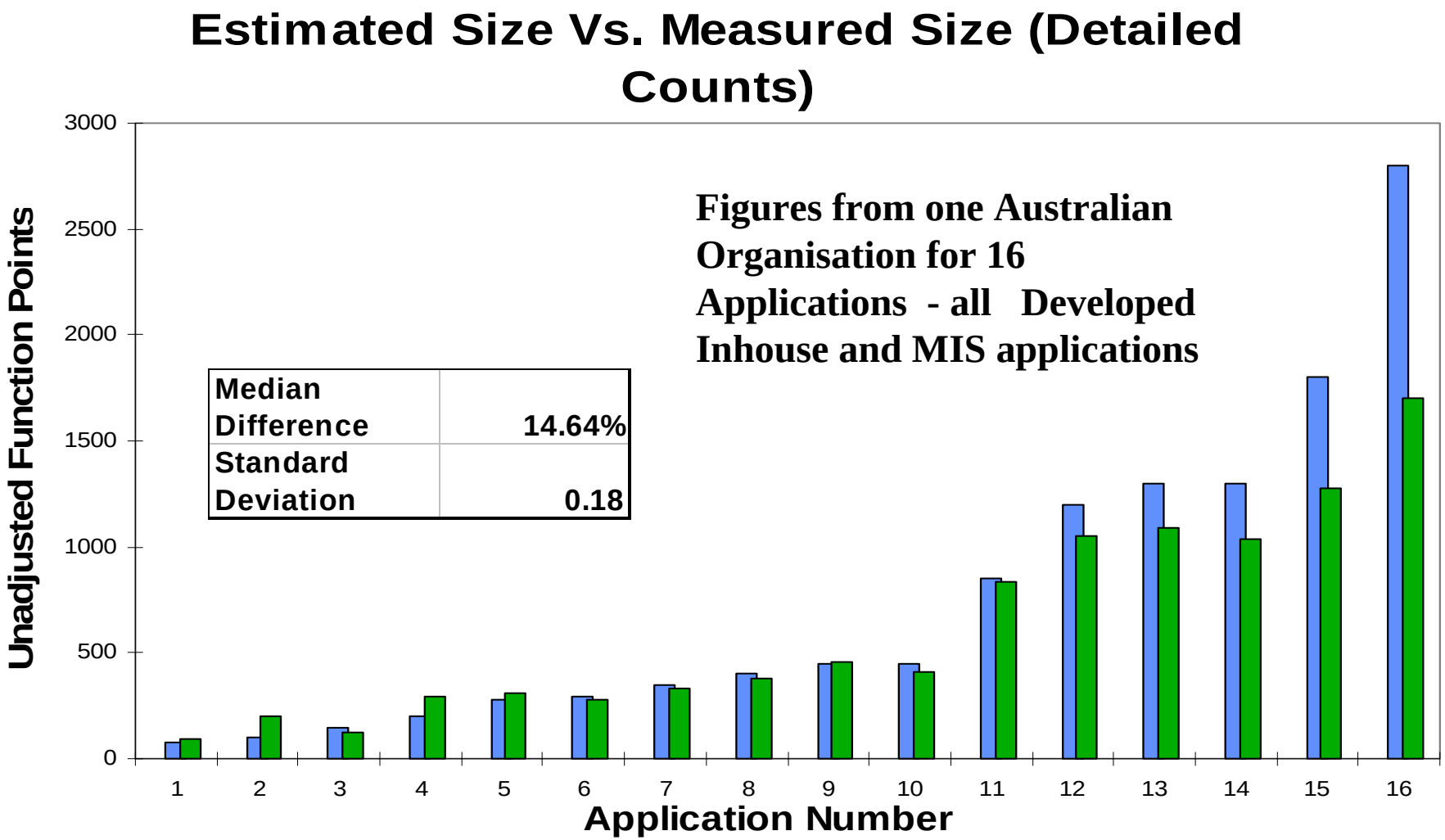
Results

- Size and productivity comparison report - 4 hours
- productivity 5 times worse than industry rates and cost was 10 times higher.

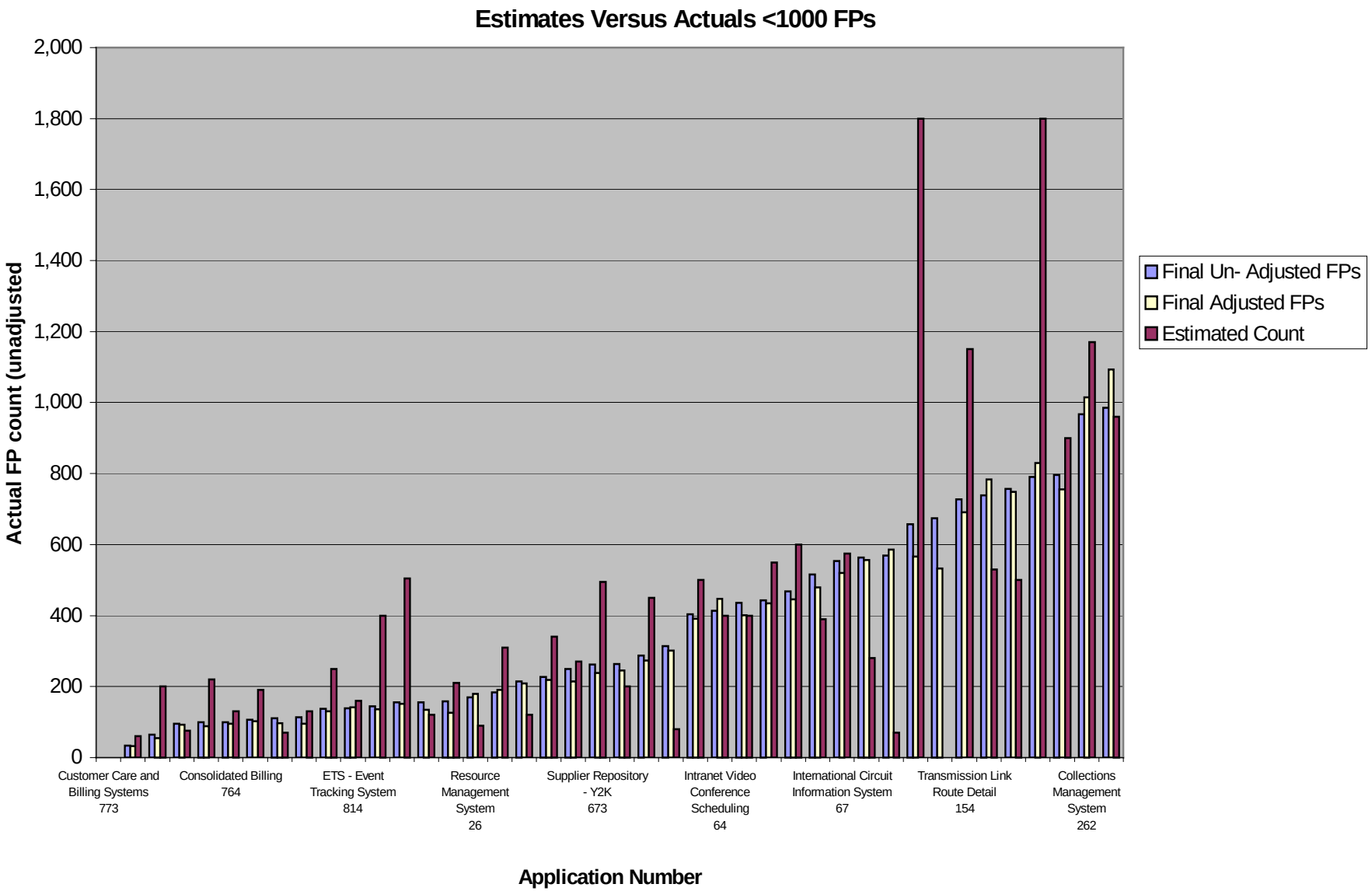
Approximate Estimated Counts Vs Actuals



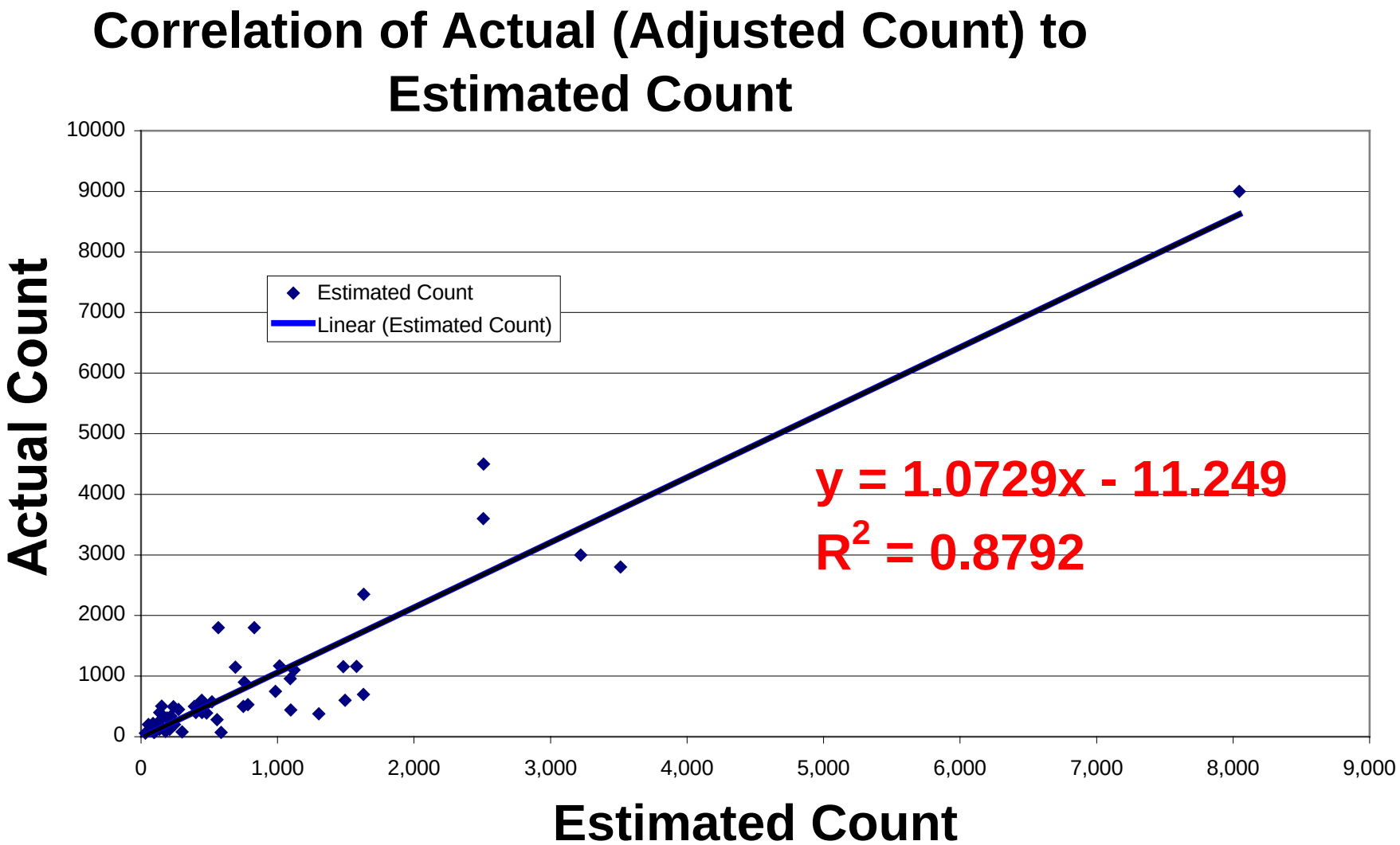
Approximate Estimated Counts Vs Actuals



Estimates Vs Actuals

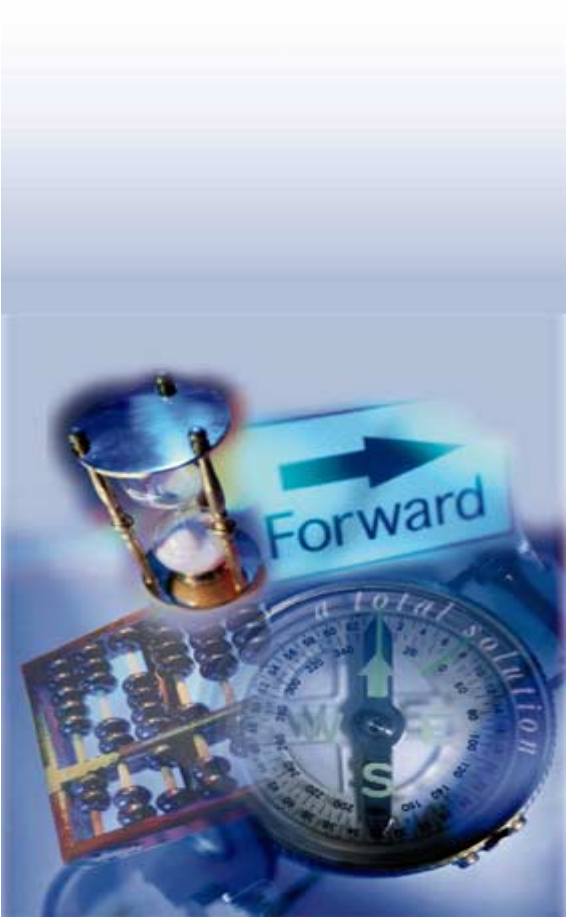


Estimates Vs Actuals



Benefits of Defining Standard 'Levels of Counting'

- Simplicity and consistency in describing count deliverables
- Improves management of customer expectations
- Basis for contract deliverables
- Easy comparison of competitive quotations for counting activity
- Simplicity in directing counters to perform counts
- Improved capability in estimating count duration
- Consistency in collecting metrics data on effort and costs of counting
- Formalizes the counting process
- Facilitates the count validation process



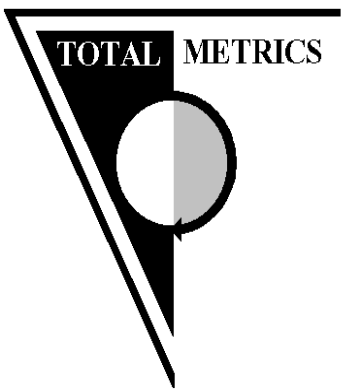
TOTAL METRICS

Recommendations

- Standardised definitions of ‘Count Levels’
- Ideally documented in FPA counting procedures
- Used as a standard basis for agreement on count deliverables by :
  - clients requiring counts
  - suppliers quoting counts
  - benchmarking companies collecting and reporting data
  - count auditors

Thank You
and
Good Luck with your Counting !

Download full details of Count Levels from Total Metrics WWW Site - WWW.Totalmetrics.com



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