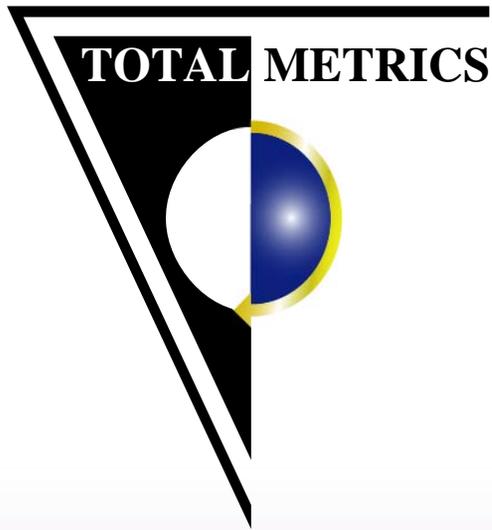# Impact of Standardisation on Functional Size Measurement

Presented by : Pam Morris
TOTAL METRICS
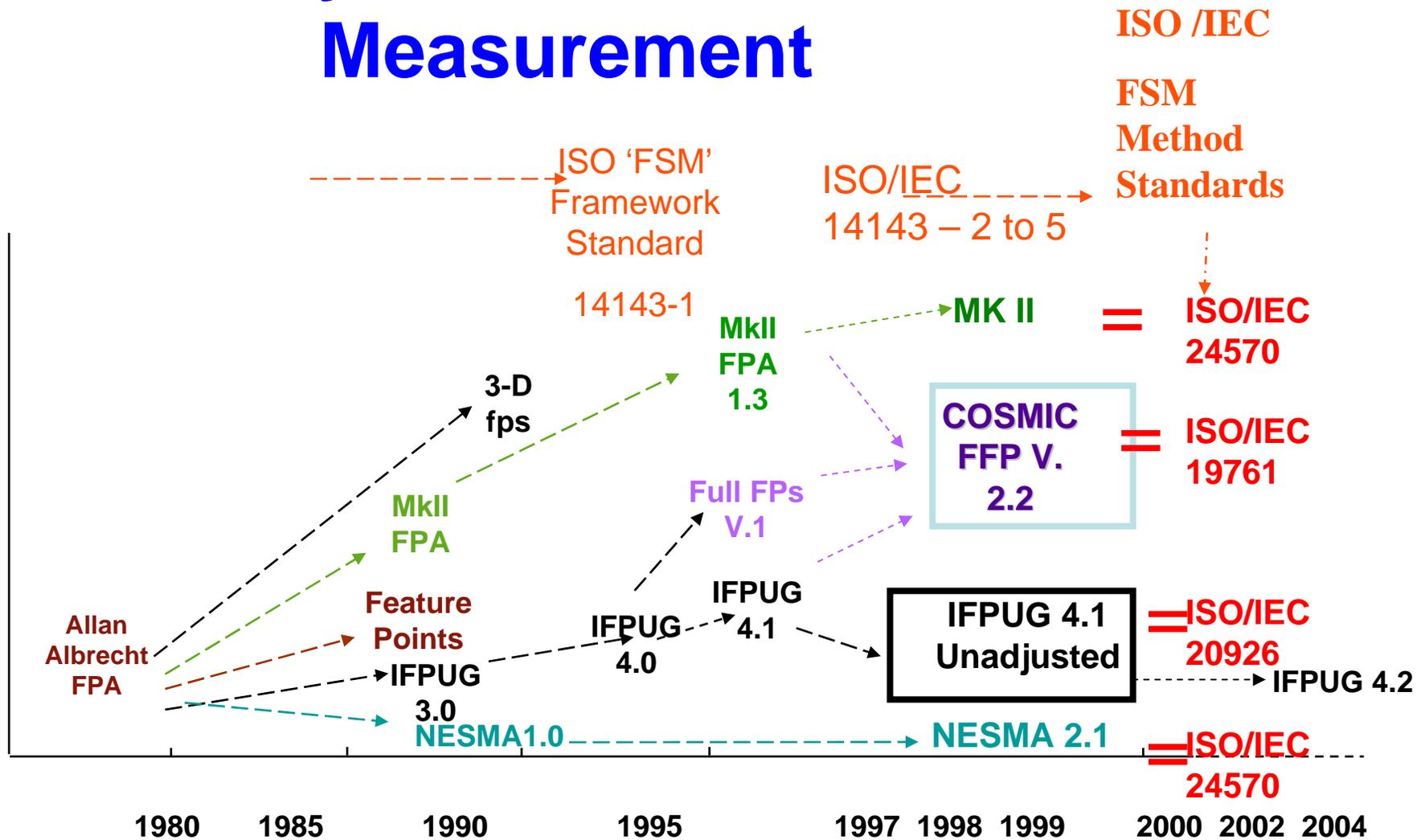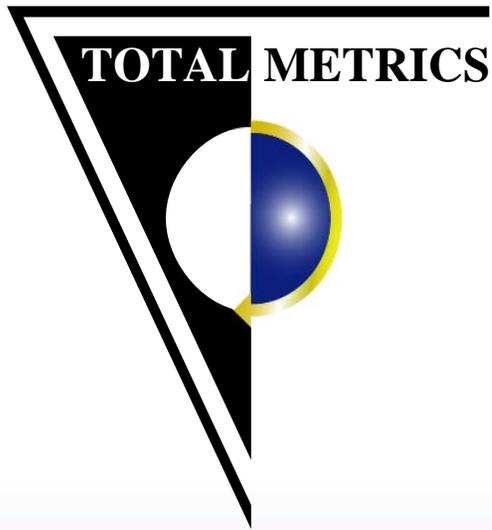
AEMES – ISBSG Conference
Madrid
October 2005

Agenda

◆ **History of Functional Size Measurement**

◆ **ISO/IEC 14143 Series of FSM standards**

◆**FSM Methods Similarities and Differences**
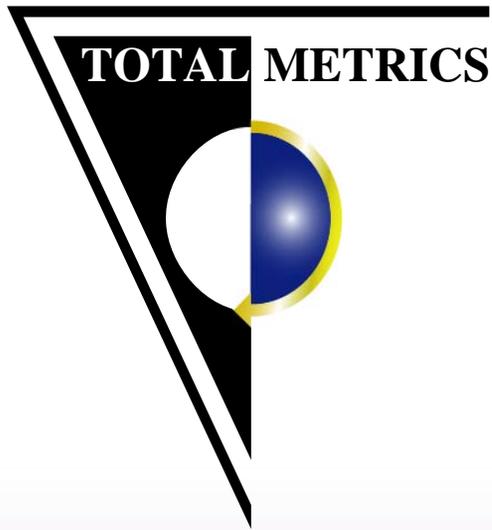
History of Functional Size Measurement

Pam Morris – FSM Profile

TOTAL METRICS

- Member of the IFPUG Counting Practices Committee 1993 - 2000
- Co-author IFPUG 4.0, IFPUG 4.1, Case Study 1, Practical Guidelines for Counting Logical Files
- IFPUG CFPS Certified since 1994
- Australian Representative ISBSG Committee
- Reviewer of the NESMA Manual CPM
- International Workgroup convenor and project editor ISO/IEC 14143 Functional Size Measurement Standards
- Core project member COSMIC (1997 - now)
- Co-author COSMIC-FFP Measurement Manual
- Author and Presenter IFPUG Certified Training courses and IFPUG IT Measurement Book
- Executive Member of the Australian Software Metrics Association (ASMA)
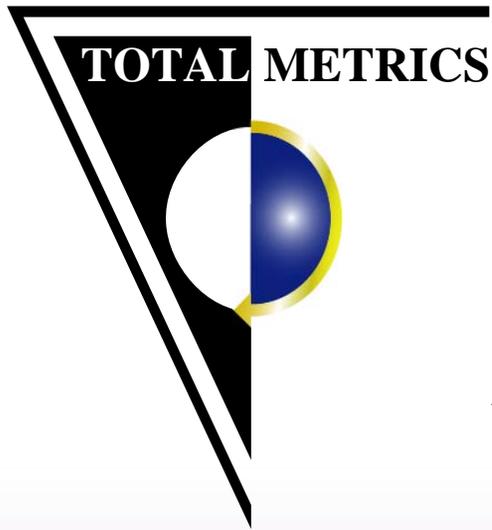- Chief Executive Officer of Total Metrics

Agenda

TOTAL METRICS

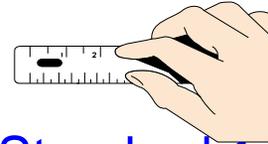- ◆ **History of Functional Size Measurement**

- ◆ **ISO/IEC 14143 Series of FSM standards**

- ◆ **FSM Methods Similarities and Differences**

Functional Size Measurement

◆ ISO/IEC/JTC1/SC7 Standard 14143-1(1998) definitions:

  ➢ **"Functional Size: <u>A</u> size of the software** derived by quantifying the Functional User Requirements."

  ➢ **"Functional Size Measurement** (FSM): The **process** of measuring Functional Size."

  ➢ **" FSM Method:** A specific implementation of FSM defined by a set of rules, which conforms to the mandatory features of this part of ISO/IEC 14143."

**Eg. IFPUG 4.1 Unadjusted, COSMIC-FFP**
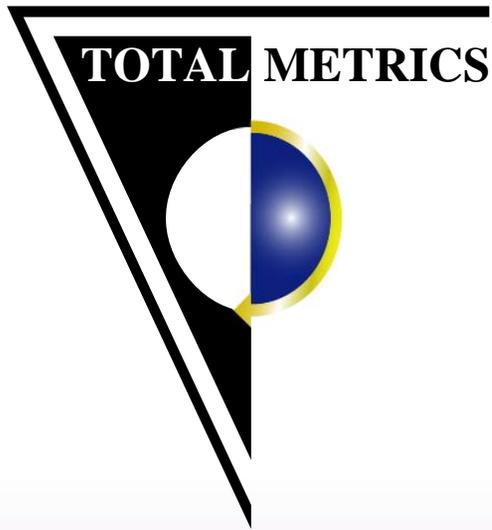
Why an FSM ISO Standard?

- ◆ Effective universal comparison
  e.g. benchmarking (ISBSG)

- ◆ Facilitates use of FSM in contractual agreements
  e.g. SouthernScope, Outsourcing

- ◆ Supports compliance with other standards
  e.g. ISO9000

- ◆ Supports process improvement initiatives
  e.g. ISO 15504

- ◆ Helps prevent improper use of 'function points'
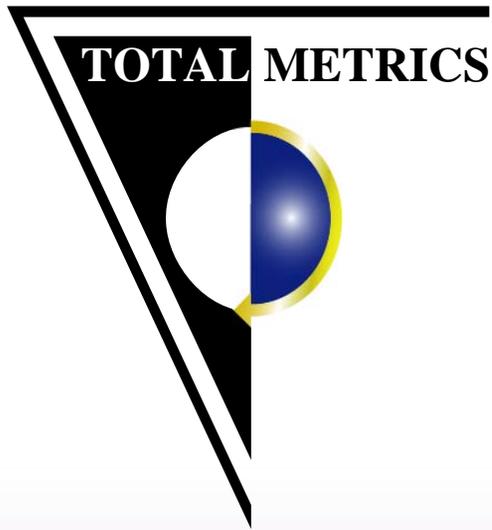 e.g. automated tools incorrectly reporting functional size

TOTAL METRICS
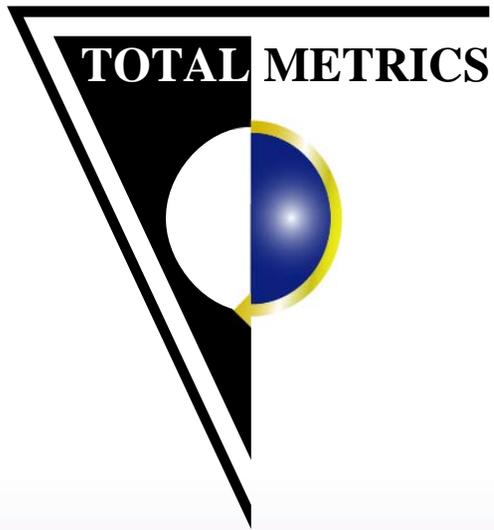
Why an *ISO* Standard?

- ◆ rigorous
- ◆ concise
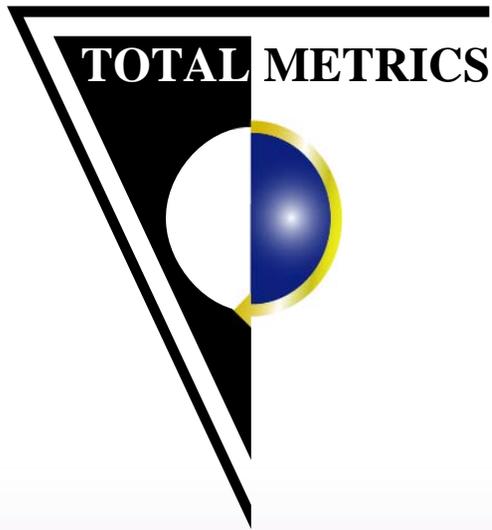- ◆ consistent
- ◆ unambiguous
- ◆ worldwide agreement

One or *many* ISO FSM Methods?

- Different ***types*** of functional user requirements
- Different ***types*** of software functional components to measure
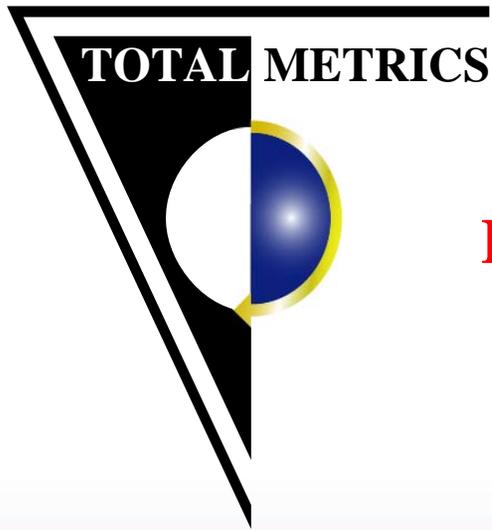
Different *FSM Methods*

ISO Conformant FSM Methods

- **IFPUG Function Point Analysis 4.1 Unadjusted**
  - ✓ (ISO/IEC 20926)

- **COSMIC-FFP**
  - ✓ (ISO/IEC 19761)

- **Mark II Function Point Analysis**
  - ✓ (ISO/IEC 20968)

- **NESMA**
  - ✓ (ISO/IEC 24570)

ISO/IEC 14143 - Parts 1 - 6

PART

1. Definition of **Concepts**

2. **Conformance** Evaluation of Software sizing methods to ISO/IEC 14143-1:1998

3. **Verification** of a Functional Size Measurement Method

4. Functional Size Measurement **Reference** Model

5. Determination of **Functional Domains** for use with Functional Size Measurement

6. **Guide for use** of ISO/IEC 14143 series and related international standards
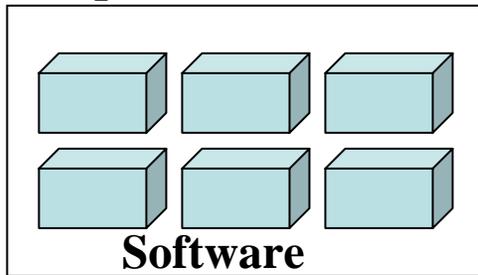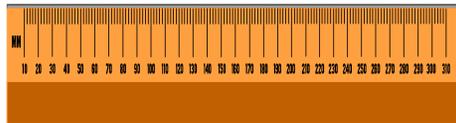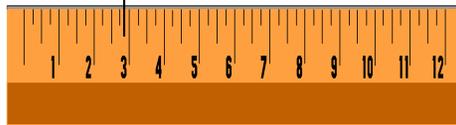
14143 Framework

PART 5 – Domain Classifications

✓**TR2**

Classifies

Uses

PART 4 - ✓ **TR2**
Example Requirements

Functional User Requirements

Software

Provides

PART 3 - ✓ **TR2**
Performance Test Criteria

Against

Measure

Tests

Checks

PART 2 - ✓ **IS**
Conformance

Against

Defines

Use

Choose

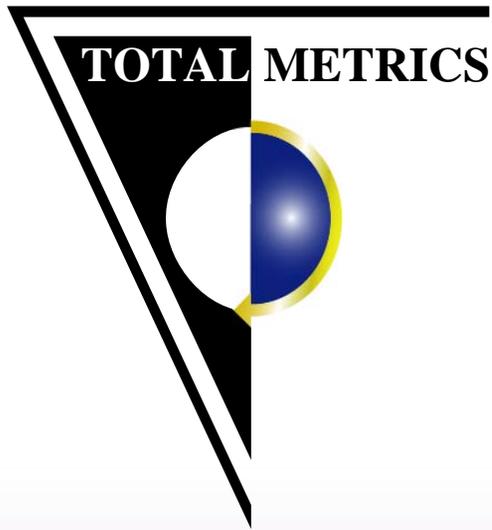ISO/IEC Functional Size Methods e.g. IFPUG, COSMIC

PART 1 - ✓ **IS**
Definitions
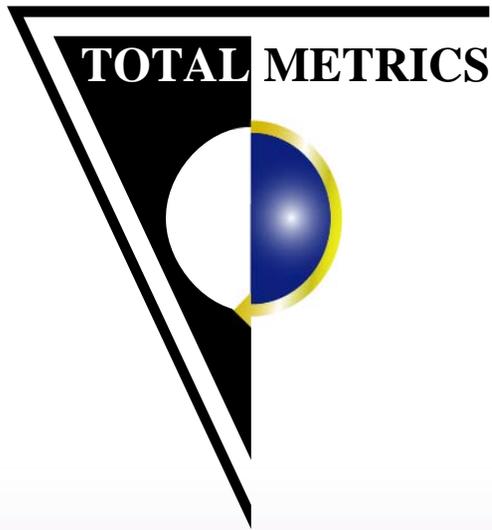
PART 6 – User Guide ? **TR2**

Benefits of FSM Standards

◆ **FSM Method *Users***

- ✓ standardised International FSM rules
- ✓ greater consistency in interpretation
- ✓ verification of effectiveness of FSM methods
- ✓ guidance for selecting appropriate FSM method
- ✓ guidance for identifying functional domain of your software
- ✓ conversion between FSM Methods

Benefits of FSM Standards

- **FSM _Methods_**
  - ✓ improve acceptance of FSM Methods
  - ✓ facilitate automation of FSM
  - ✓ worldwide contribution to FSM development
  - ✓ public domain access to Reference User Requirements
  - ✓ strict change control of FSM Methods
  - ✓ encourage refinement of FSM Methods
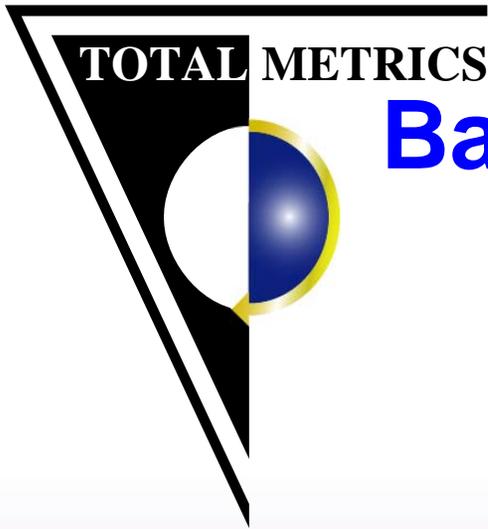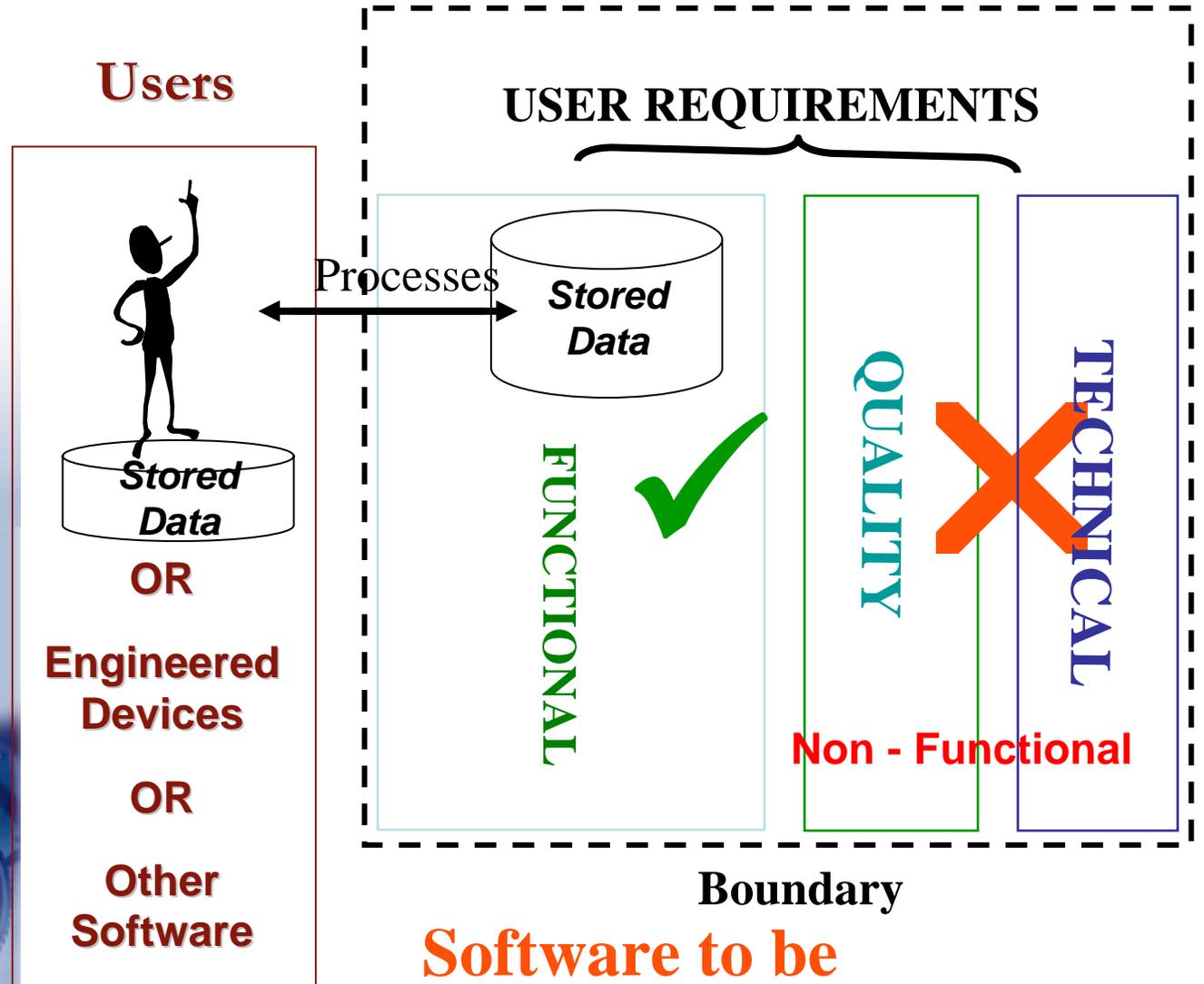 - ✓ facilitates development of alternative FSM Methods
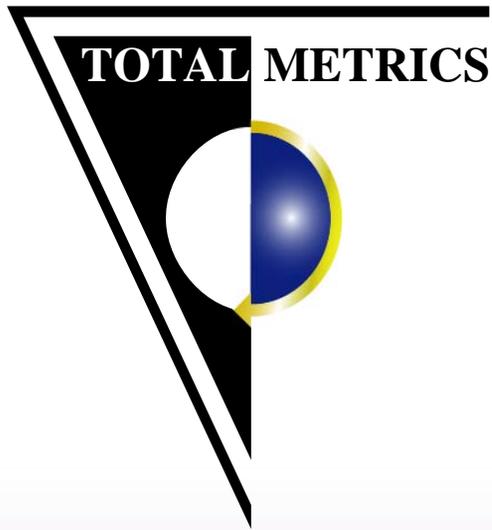
Agenda

◆ **History of Functional Size Measurement**

◆ **ISO/IEC 14143 Series of FSM standards**

◆ **FSM Methods Similarities and Differences**

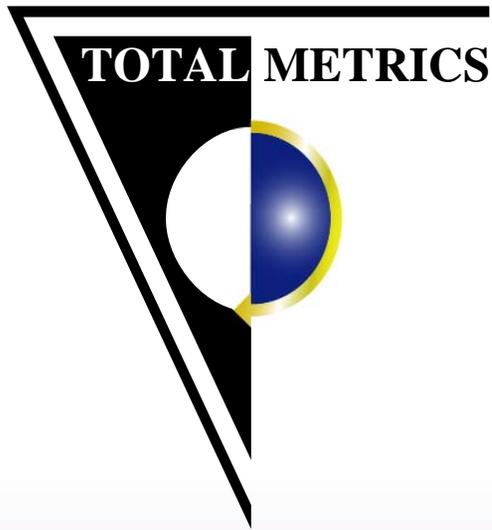# Basic Concepts of FSM
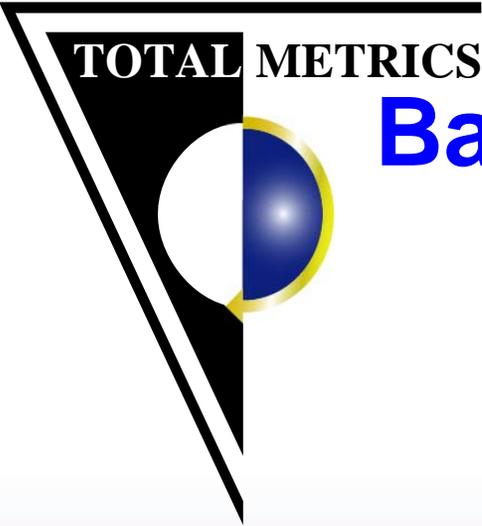
Users

USER REQUIREMENTS

Processes

Stored Data

FUNCTIONAL ✔

QUALITY ✖

TECHNICAL

Non - Functional

Stored Data

OR

Engineered Devices

OR

Other Software
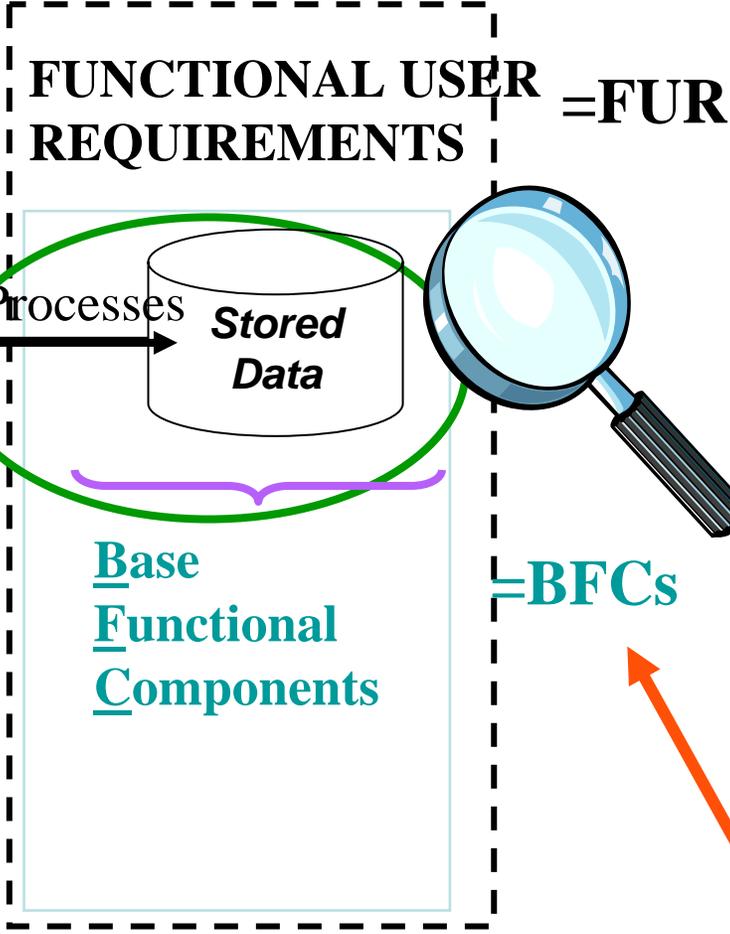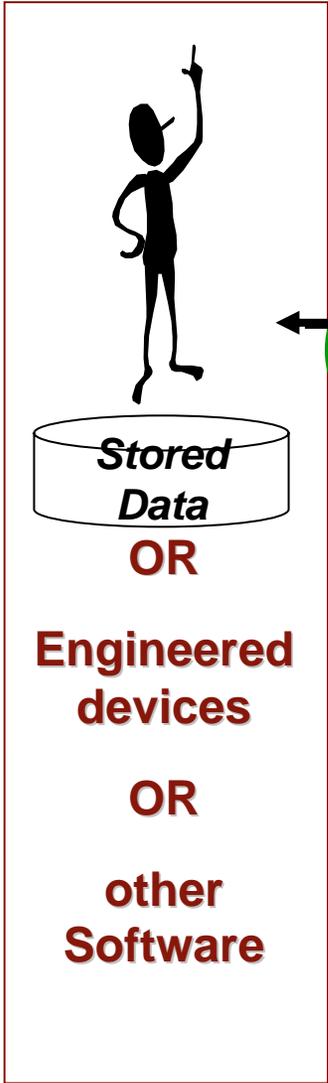
Boundary

Software to be measured

Characteristics of Functional Size Measurement

◆ Measures Functional User Requirements

◆ Excludes:

  ➢ physical or technical components

  ➢ quality features

◆ derived in terms understood by users of the software

◆ derived without reference to:

  ➢ effort to develop or support

  ➢ methods used

Basic Concepts of FSM

FUNCTIONAL USER REQUIREMENTS =FUR

Processes

Stored Data

Stored Data

OR

Engineered devices

OR

other Software

Base **F**unctional **C**omponents

=BFCs

MEASURED FOR SIZE

BOUNDARY

IFPUG BFC Types

INPUT, OUTPUT, ENQUIRY

Processes

Stored Data

Stored Data

EXTERNAL INTERFACE FILE

INTERNAL LOGICAL FILE
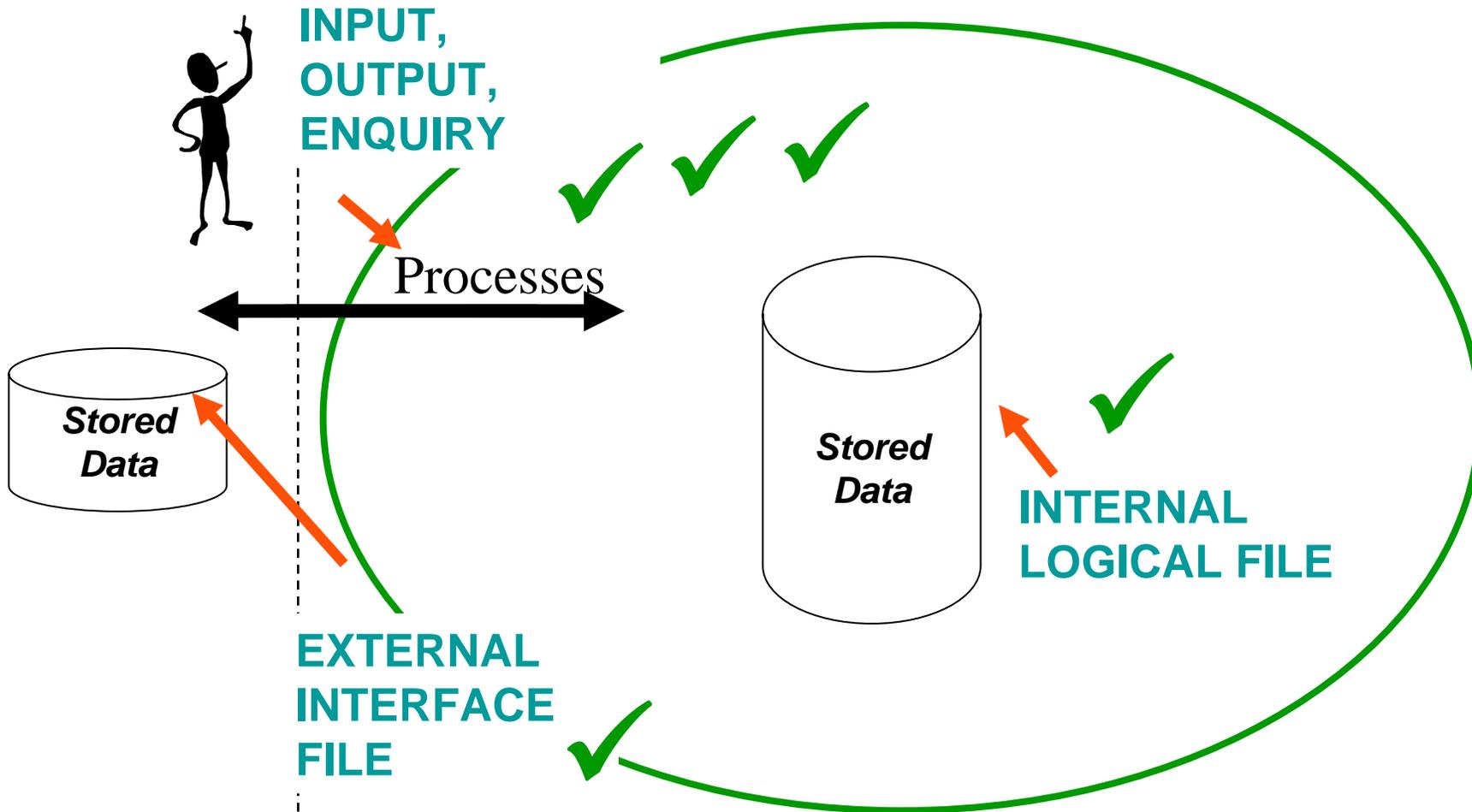
5 Base Functional Component Types (BFC Types✓)

COSMIC BFC Types

COSMIC = ENTRY

COSMIC = READ

COSMIC = WRITE

COSMIC = EXIT
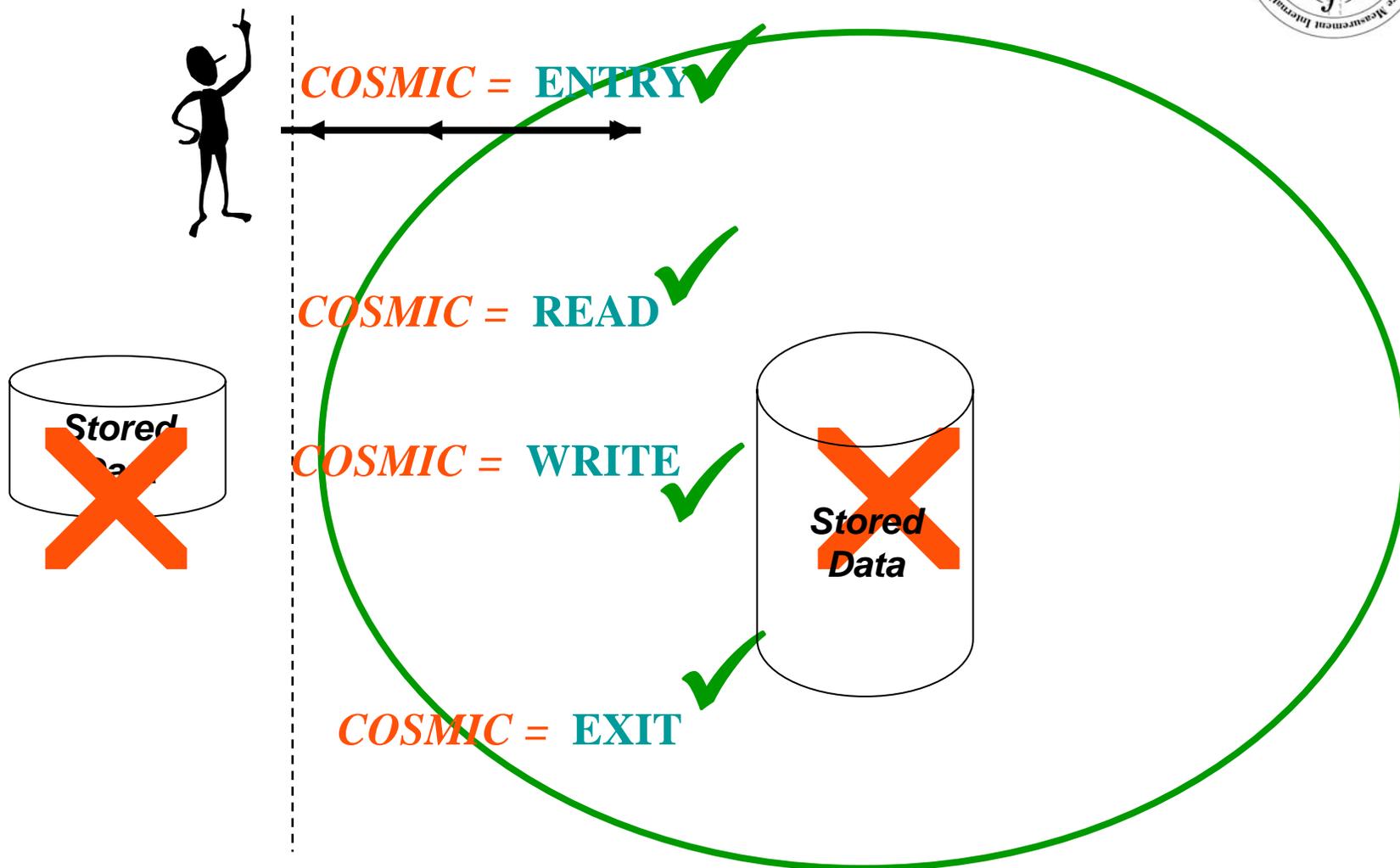
4 Base Functional Component Types (BFC Types ✓)
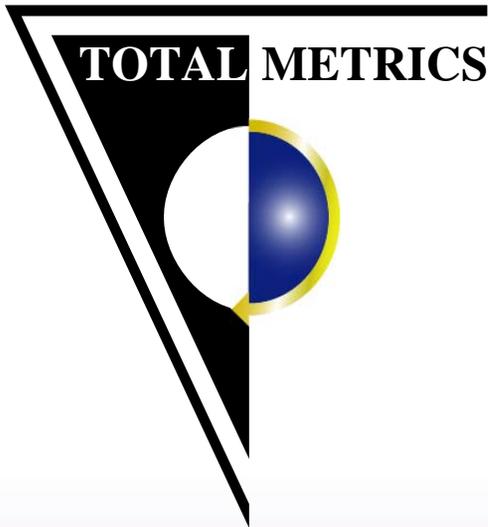
Comparison of Functional Size Process Level

TOTAL METRICS

Size of Process

| IFPUG	BFC Type	FPs	COSMIC		BFC Type	CFSU
Process			**Process**	**Sub-Process**		
Create Order Process	EI	**6**	**Create Order Process**	Enter Order Header Details	ENTRY	1
				Enter Order Item Details	ENTRY	1
				Read Product Details	READ	1
				Read Template	READ	1
Order	ILF	10		Read General Ledger	READ	1
Order Template	ILF	7		Display Order Header Details	EXIT	1
Product	ILF	7		Display Order Item Details	EXIT	1
General Ledger	EIF	5		Display Message	EXIT	1
				Write Order Header	WRITE	1
				Write Order Item details	WRITE	1
		35				**10**

Data is shared over all processes

Influence of data is incorporated into each process
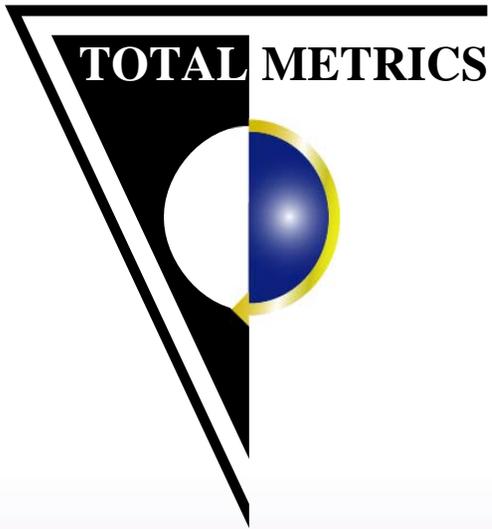
Comparison of Functional Size Application Level "*Order Processing System*"

TOTAL METRICS

IFPUG	FPs	COSMIC	CFSU
Processes	115	Processes	156
Data	48	(-)	0
	163		**156**
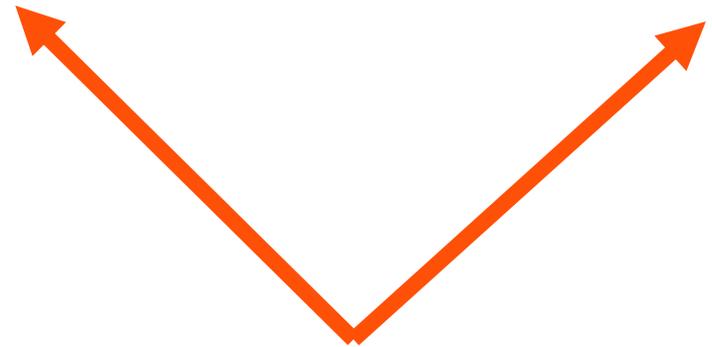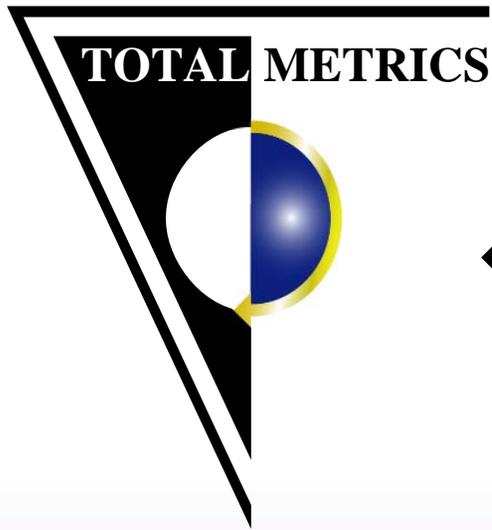
Similarities
IFPUG and COSMIC

◆ **both recognise:**

➢ Elementary processes as a functional unit to be measured

➢ data moving in/out of a process as contributing to functional size

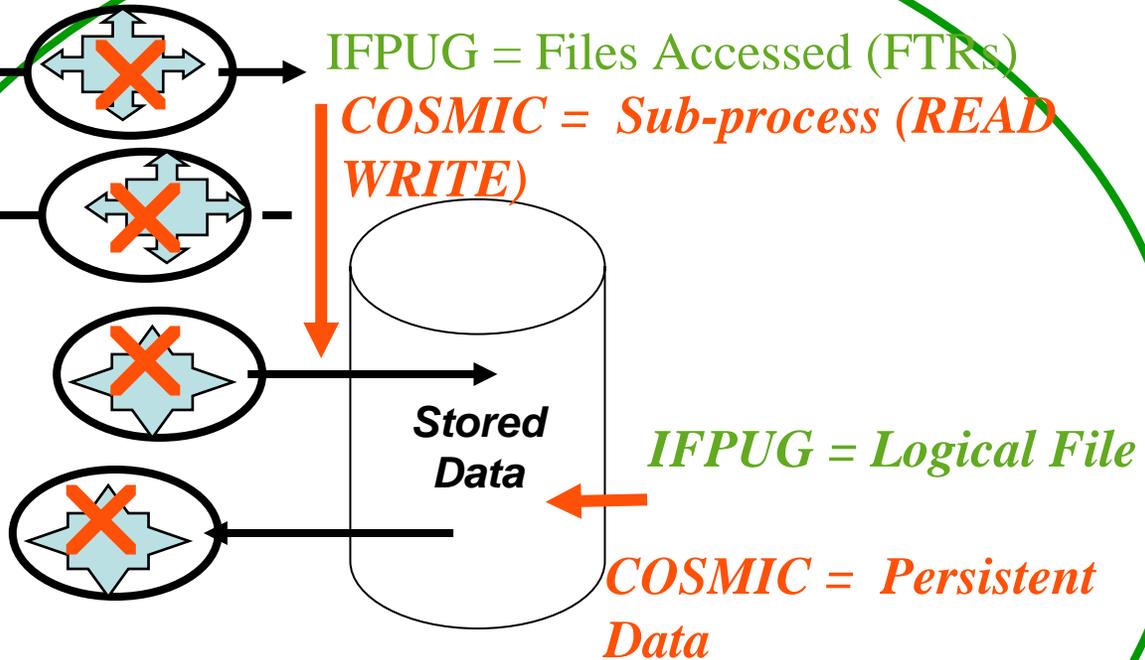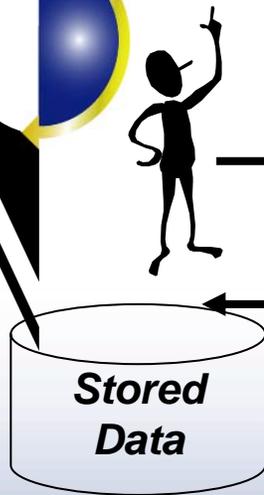➢ data accesses to persistent data as contributing to functional size

◆ **DO NOT specifically measure:**

➢ algorithms, processing logic, data transformations, calculations etc.

PROCESS

IFPUG = Files Accessed (FTRs)

COSMIC = Sub-process (READ WRITE)

Stored Data

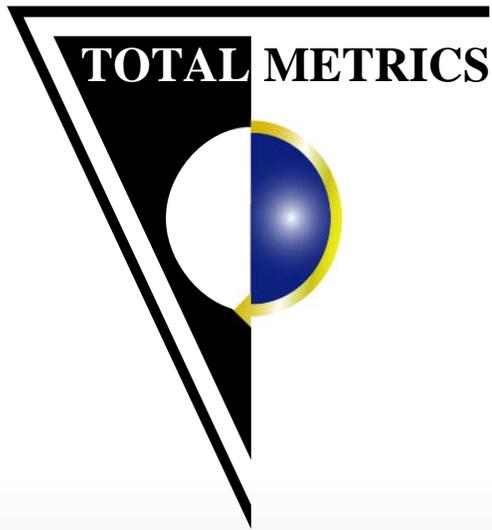Stored Data

IFPUG = Logical File

COSMIC = Persistent Data

IFPUG = DETs crossing boundary

COSMIC = Sub-process (ENTRY, EXIT)

So Which Method to Choose?

◆ **READ ISO/IEC 14143-6 – things to consider:**

➢ availability of support services

   ✴ training

   ✴ tools historical data

   ✴ skilled functional size analysts

➢ how the size result will be used

➢ Industry profile, recognition

➢ functional domain of software to be measured (embedded process rich or data rich MIS?)

➢ capability maturity of your organisation

➢ FSM Used by other parts of your organisation
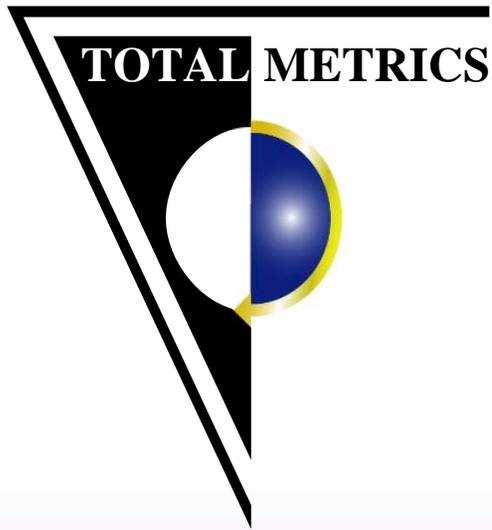
REMEMBER

◆ **<u>BOTH</u> METHODS**

➢ Used internationally

➢ ISO/IEC FSM standards

➢ Collected by ISBSG Repository

➢ 'work' in most environments

➢ developed and refined by international experts (sometimes the same ones!)

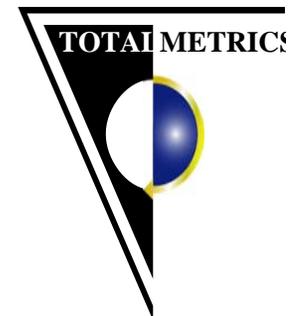# More Information

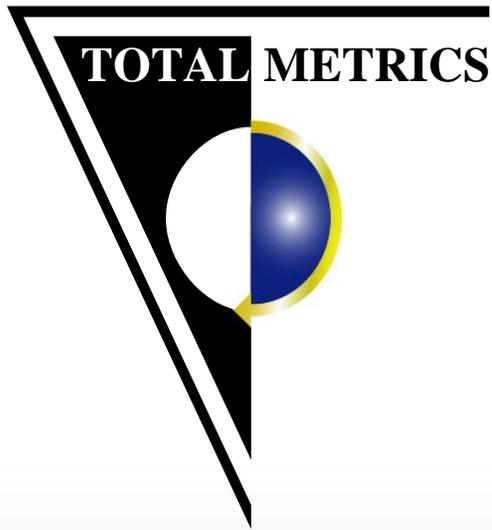◆ **IFPUG**
  ➤ www.ifpug.org/

◆ **COSMIC-FFP**
  ➤ www.cosmicon.com/

◆ **TOTAL METRICS**
  ➤ www.totalmetrics.com/

THANK YOU

Total Metrics Pty Ltd
Suite 1, 667 Burke Road
Camberwell
Victoria   3124   Australia
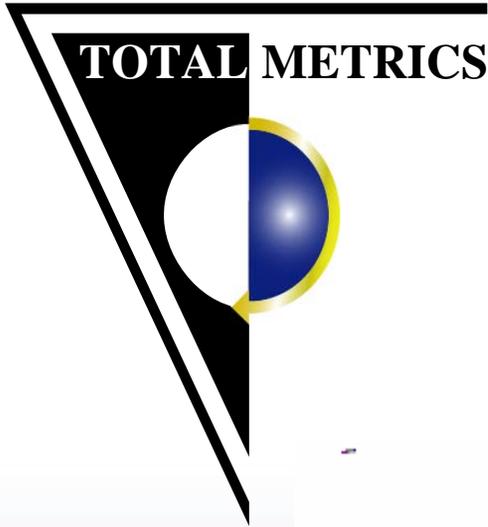**Ph   +613 9882 7611**
Fax +613 9882 7633
Pam.Morris@Totalmetrics.com

"To measure is to know!"

This presentation is available from DOWNLOADS at:

WWW.totalmetrics.com

Decision making without Standardised Measurement Data

Measures Measures Measures

Measures Measures Measures

Management Decisions