COSMIC-FFP and IFPUG 4.1 Similarities and Differences

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TOTAL METRICS

CAI Presentation
October 14 2009
5:00pm

About Total Metrics

- *"We support organisations in their quest to optimize the cost effectiveness and efficiency of their software delivery"*
- Internationally based - Certified IFPUG and COSMIC Consultants and Trainers – Europe, UK, USA, Australia
- Provide metrics related tools, procedures, consulting and training
- Thought leader in functional size measurement and developers of :

- for organizations serious about measuring Functional Size - Multi-lingual Korean, Chinese, Japanese, Portuguese, Spanish , German, Dutch, Italian, French, English etc. FREE Evaluations see WWW.totalmetrics.com

Agenda

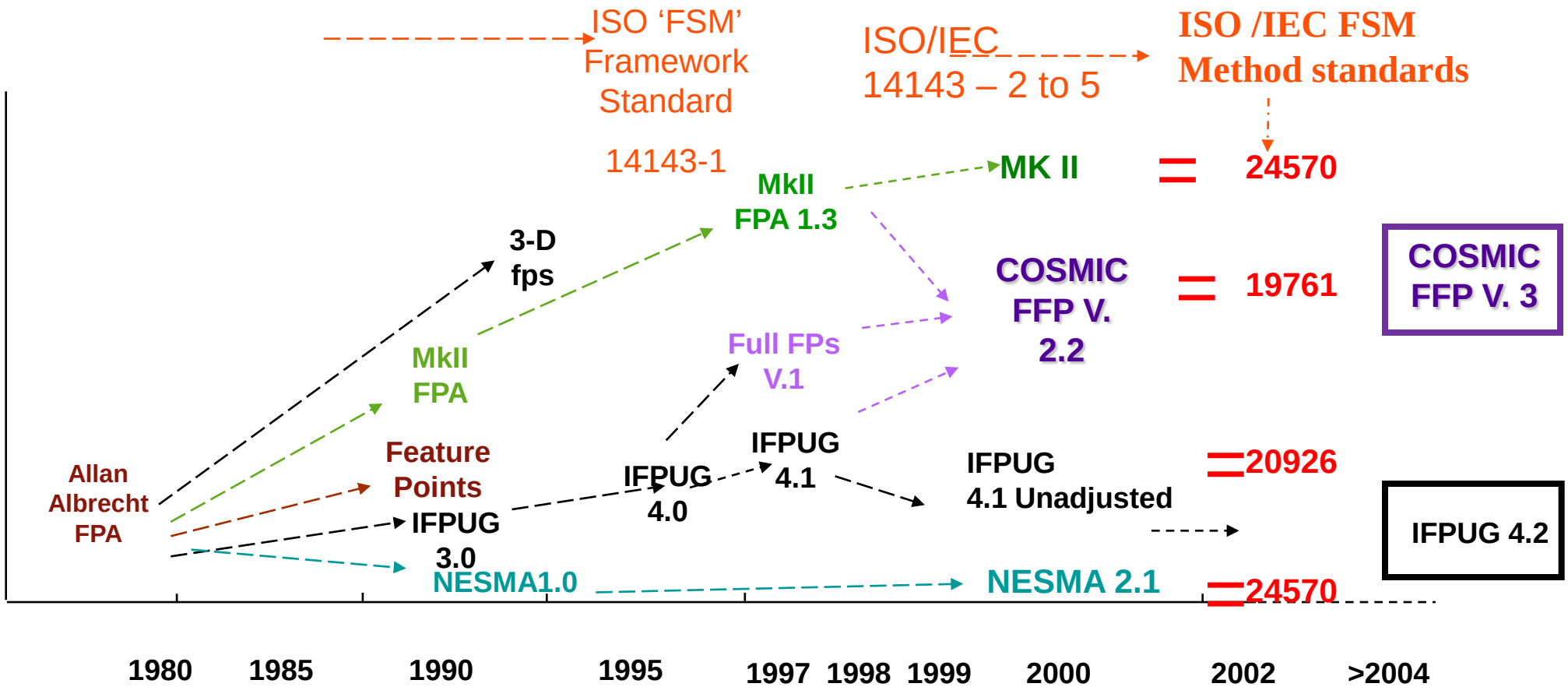
- **History of Functional Size Measurement**

- **14143-1 Definitions of Functional Size**

- **Similarities and Differences**

- **When to use what FSM Method**

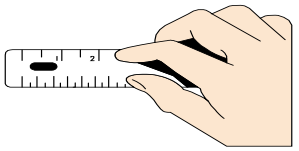
History of Functional Size Measurement



Pam Morris – IFPUG and COSMIC background

- 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, Reviewer IFPUG 4.2 and 4.3
- IFPUG CFPS Certified since 1994
- Vice President ISBSG Executive since 2007
- 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/Reviewer COSMIC-FFP Measurement Manual
- Author and Presenter IFPUG Certified Training courses and IFPUG IT Measurement Book
- Executive Member of QESP Australia
- Chief Executive Officer of Total Metrics

Functional Size Measurement



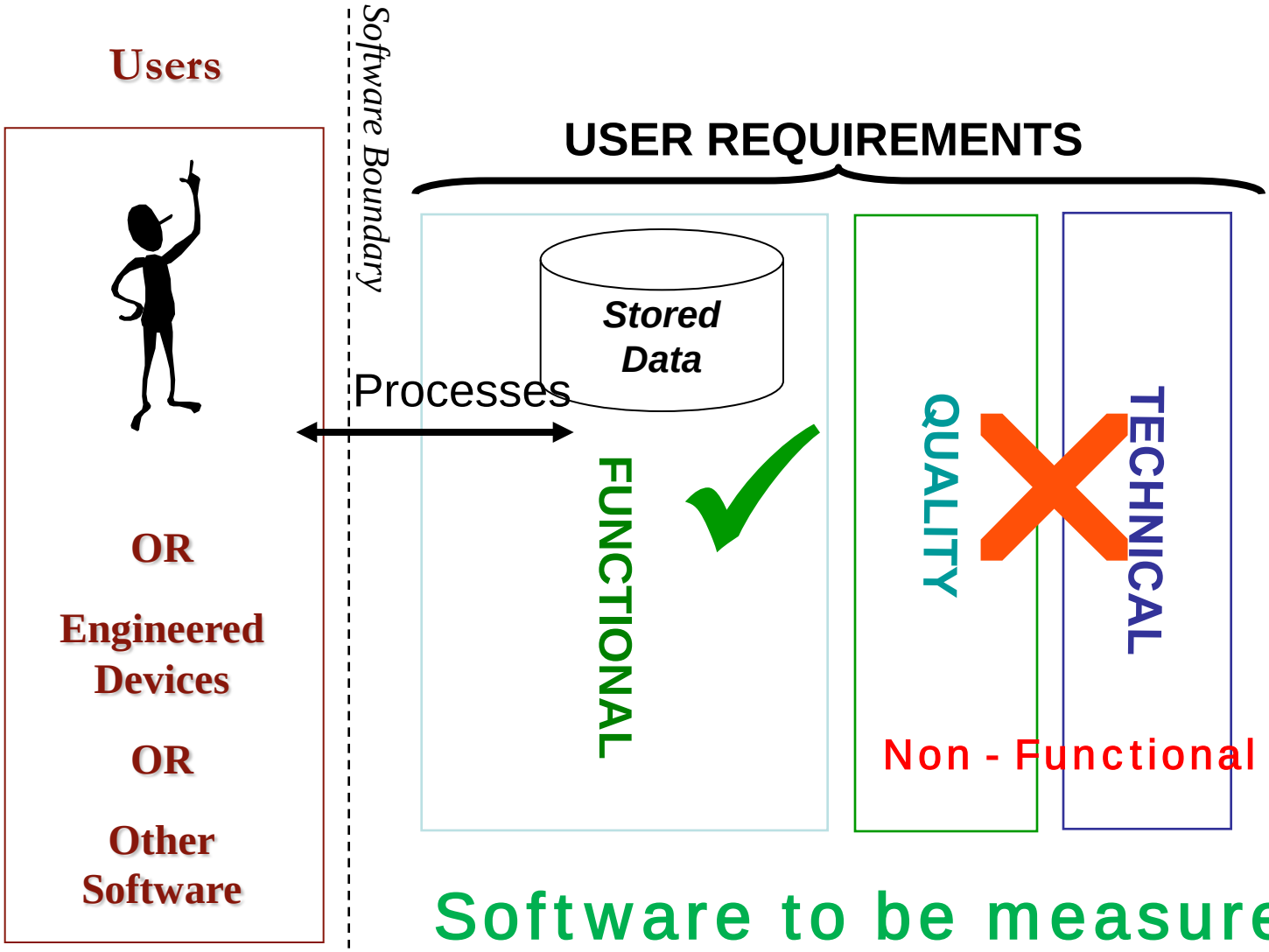
- ISO/IEC/JTC1/SC7 Standard 14143-1(2004) definitions:
  - **"Functional Size:** **A size of the software** derived by quantifying the Functional User Requirements."
  - **"Functional Size Measurement** (FSM): The **process** of measuring Functional Size."
  - **" FSM Method:** A specific implementation of FSM defined by a set of rules, which conforms to the mandatory features of this part of ISO/IEC 14143."

E.g. IFPUG 4.3 , COSMIC-FFP

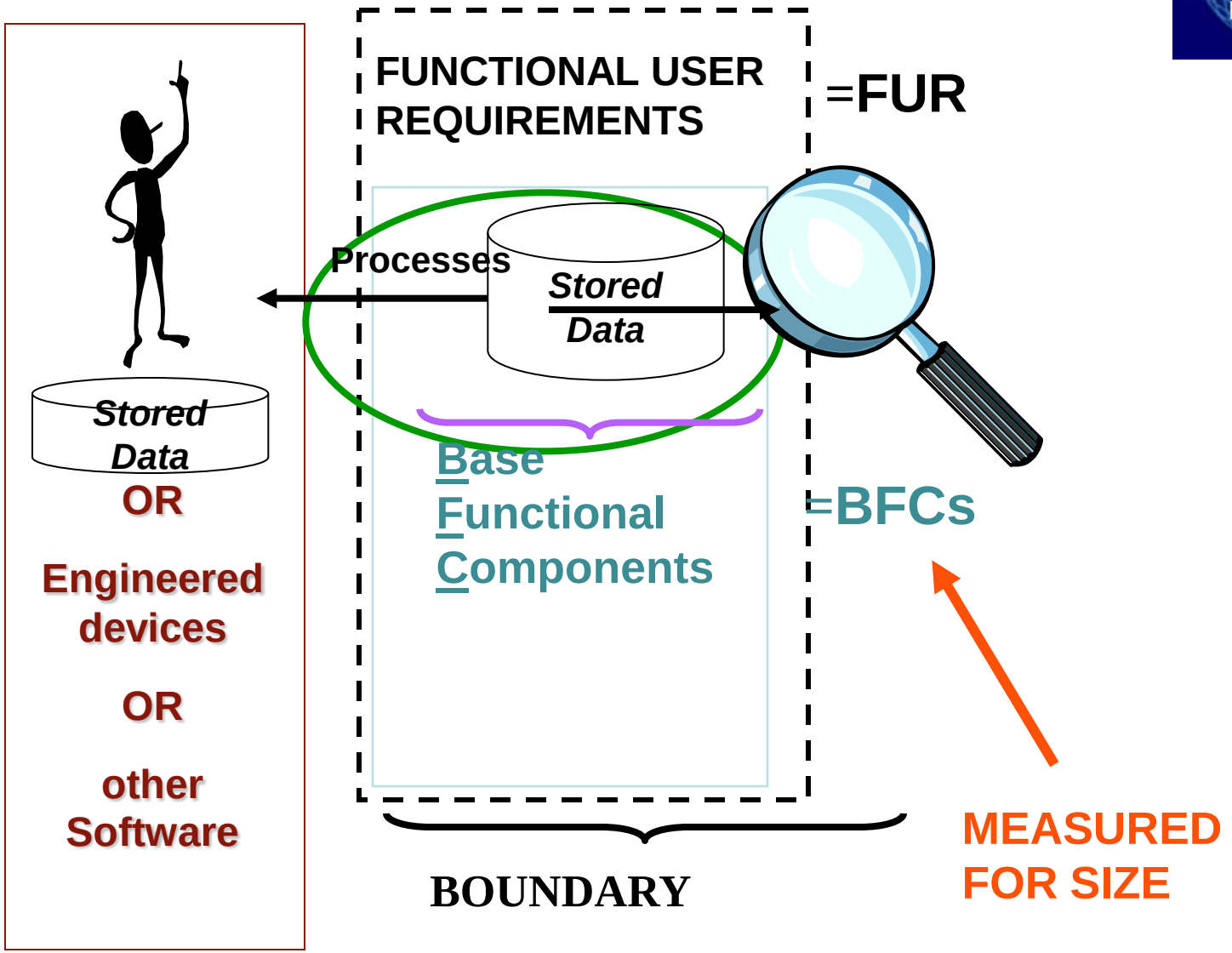
Characteristics of Functional Size Measurement

- 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

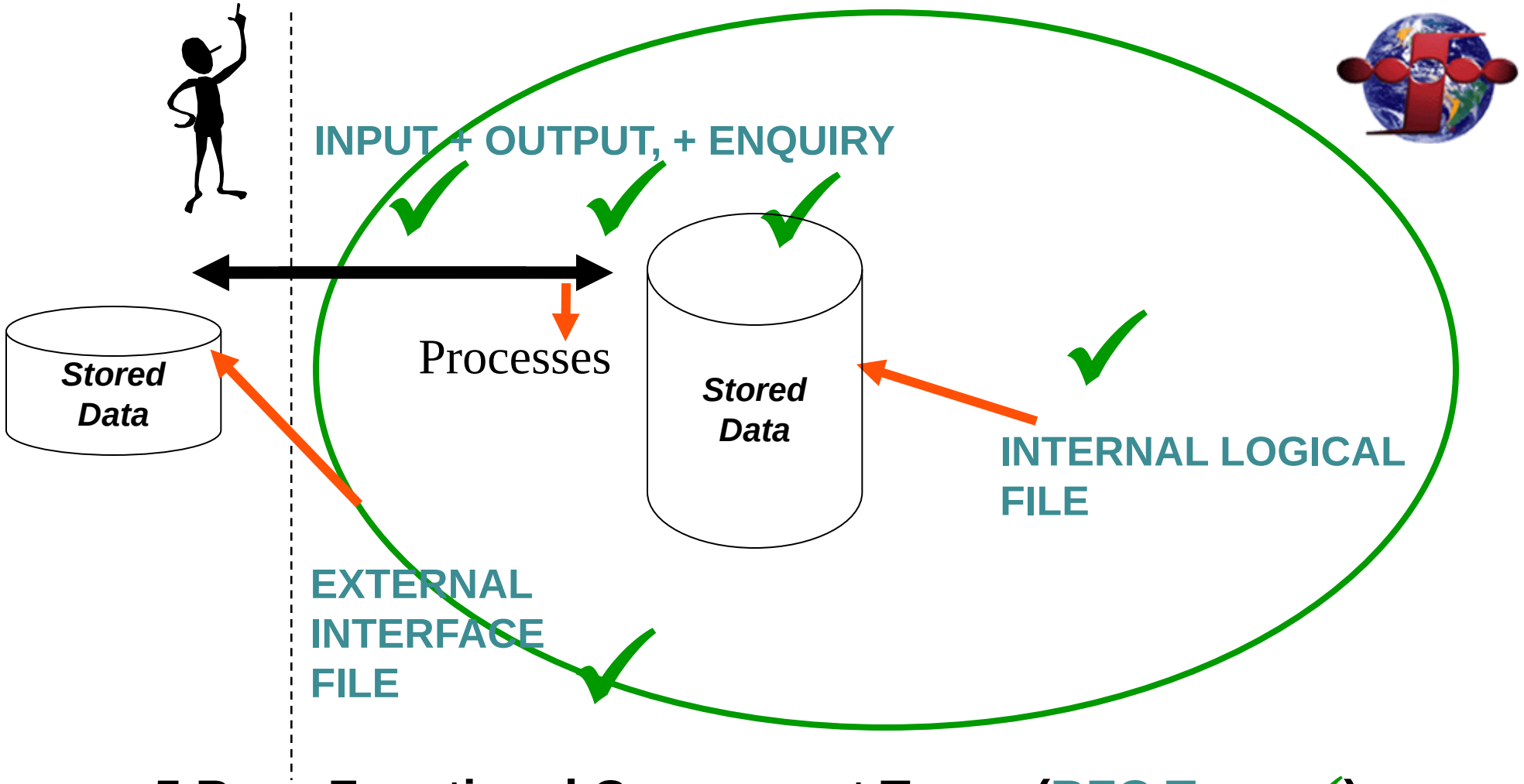
Basic Concepts of FSM



Basic Concepts of FSM

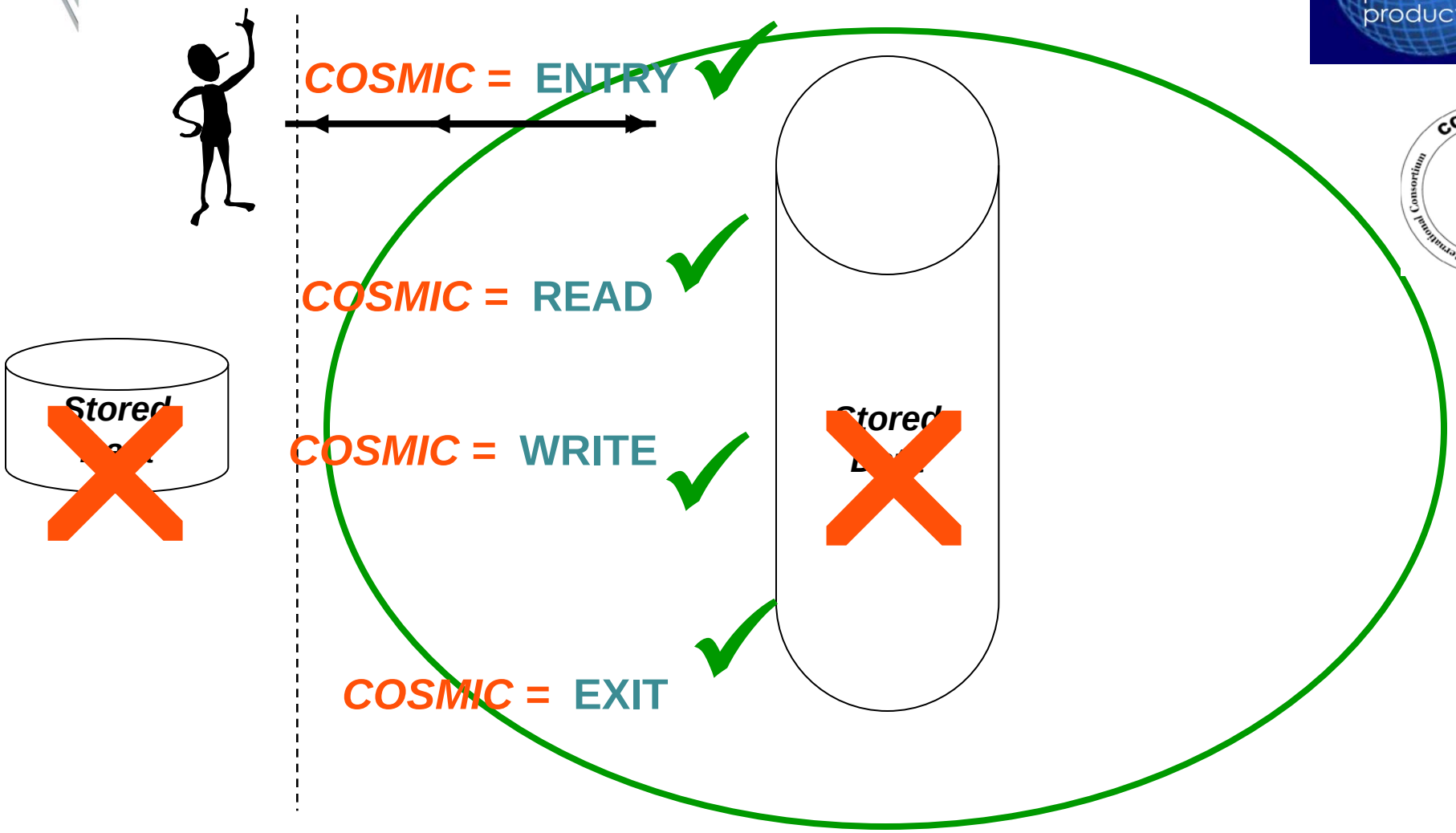


IFPUG BFC Types



5 Base Functional Component Types (BFC Types✓)

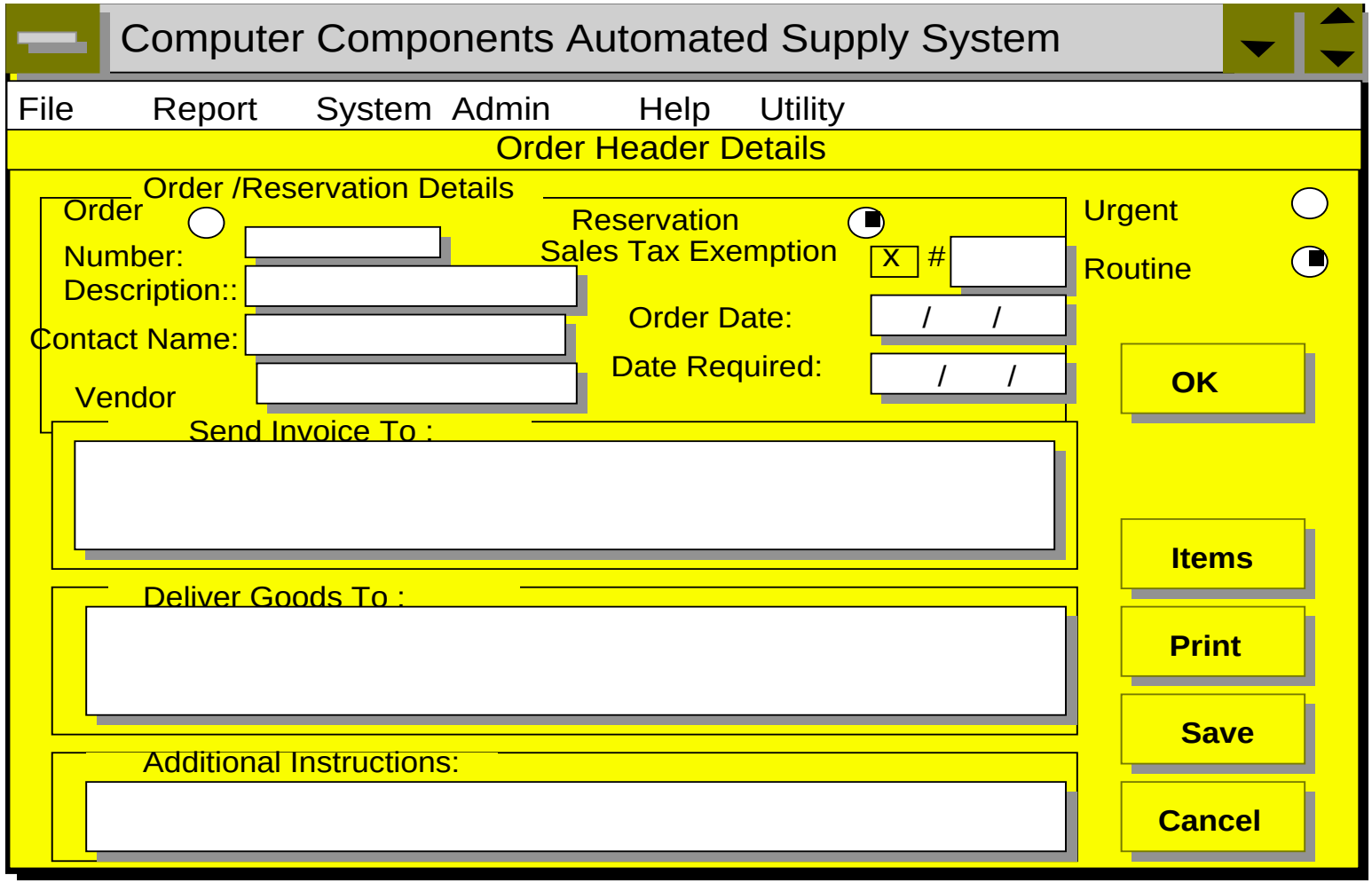
COSMIC BFC Types



4 Base Functional Component Types (BFC Types✓)

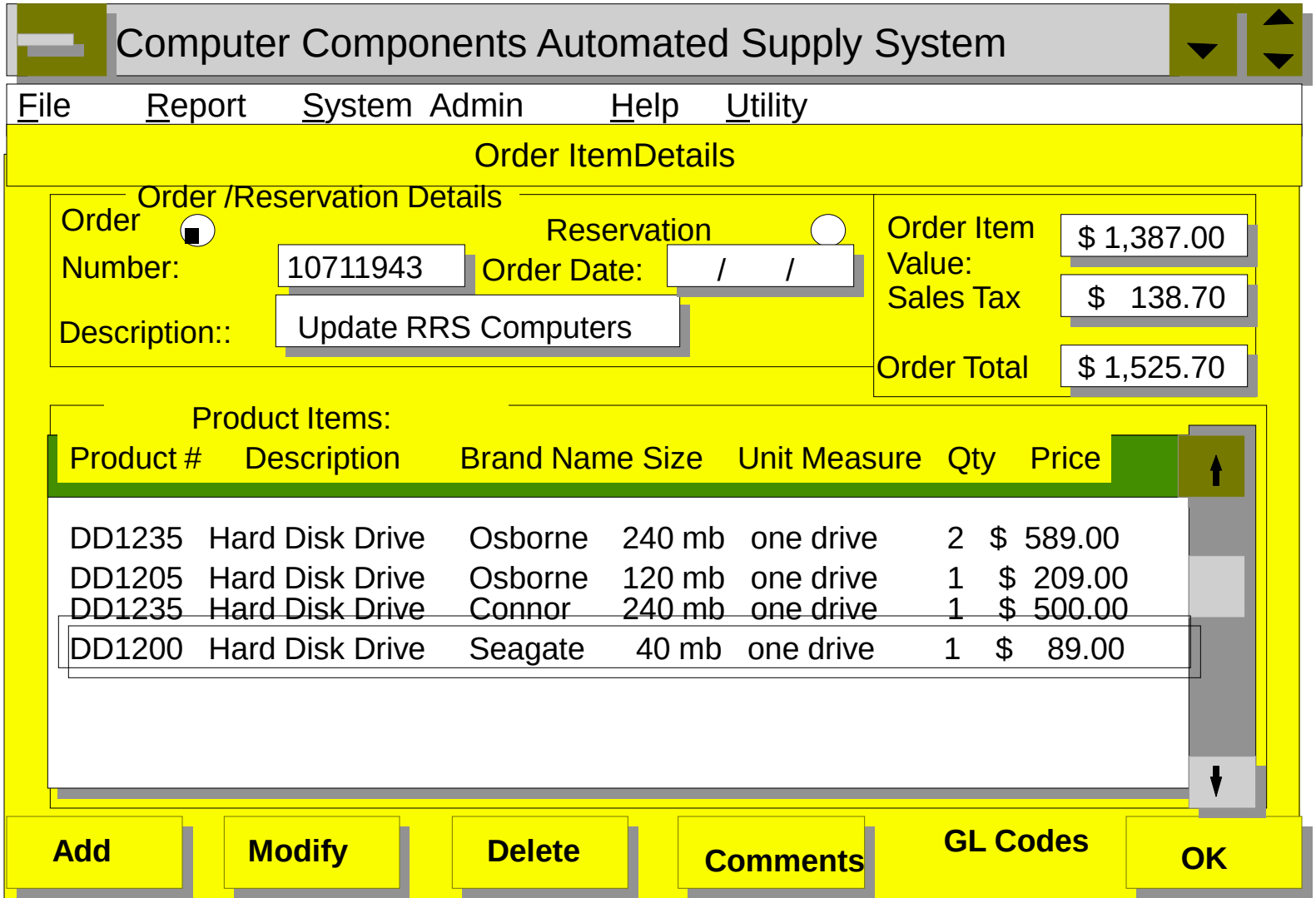
Sizing example: *Create New Order*

ORDER HEADER SCREEN

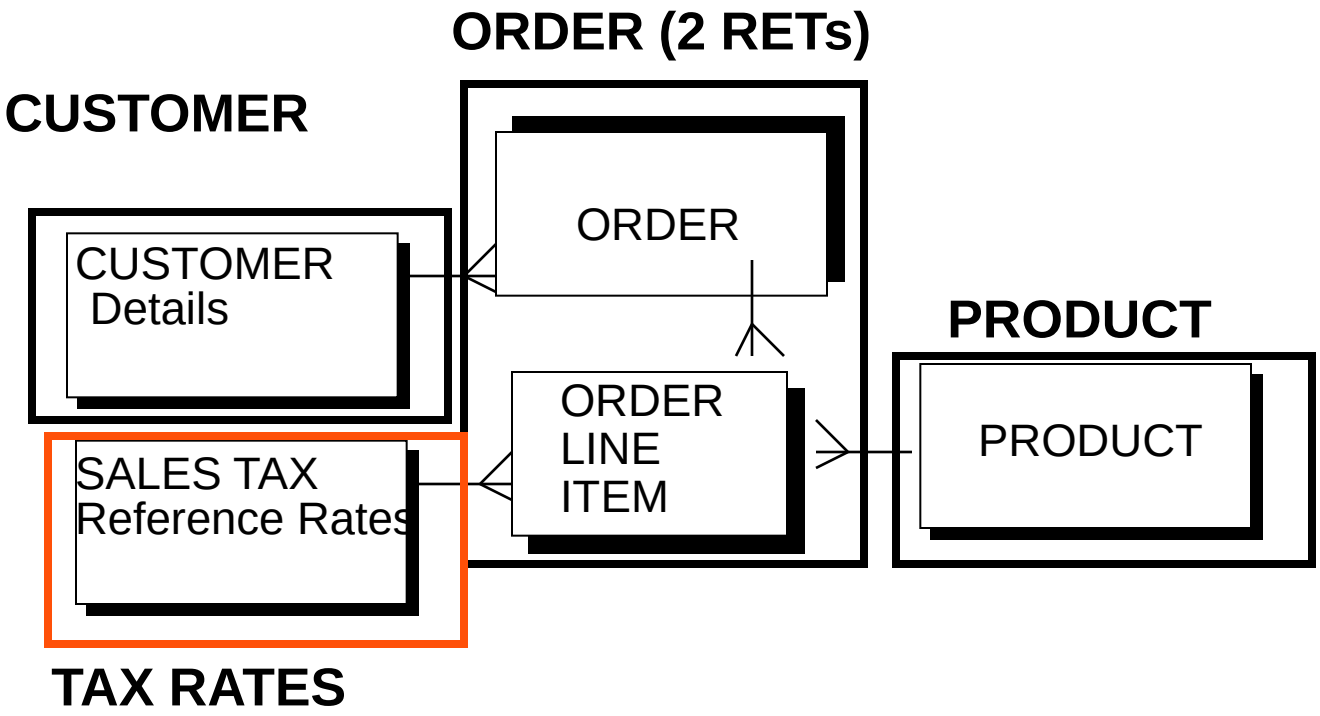


E.g. *Create New Order*

ORDER ITEM DETAILS SCREEN



IFPUG - Identify Logical Files

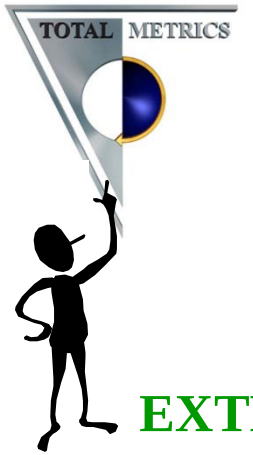


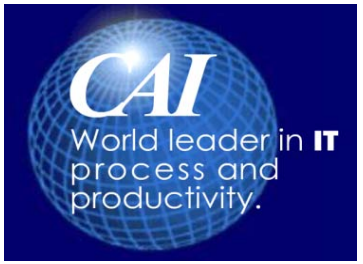
= 3 ILFs (1 average, 2 low complexity) = 24 function points

= 1 EIF (low) = 5 function points

Total Data Groups = 29 function points

IFPUG Count – Identify DETs and FTRs



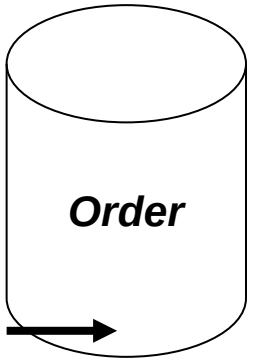


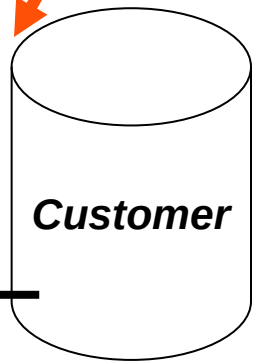
24 DETs

EXTERNAL INPUT

DETS Entering / Exiting Process		
1. Order Type	2. Division Invoice Address	3. Reservation Number
4. Date Required	5. Additional Instructions	6. Order Description
7. Contact Name	8. Priority Flag	9. Delivery Address
10. Reservation Number	11. Order Number.	12. Sales Tax Exemption #
13. Order Date	14. Order Total	15. Sales Tax
16. Sales tax rate	17. Quantity	18. Product Code
19. Product Description	20. Item Size	21. Item Price
22. Item Order Value	23. Error / confirmation Message	24. Action /control

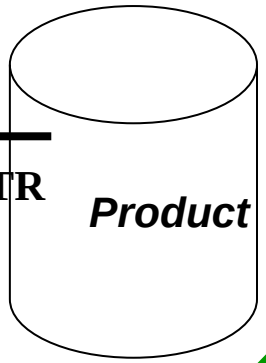
4 FTRs





FTR

FTR



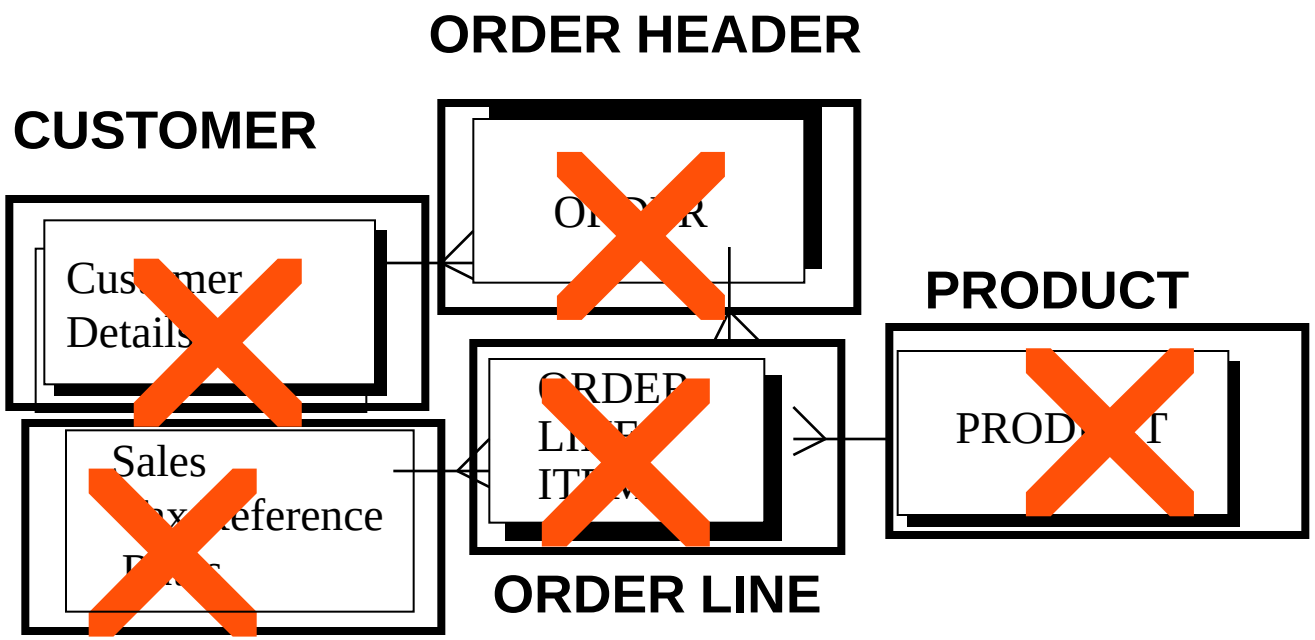
FTR

=High Complexity EI

= 6 function points

FTR

COSMIC - Group Persistent Data - 3NF



Group Persistent data into 3rd Normal form

= **5** Persistent Data Groups

Not BFC Type

Total = 0 CFP

Identify READs from Persistent Data

- **READ** *Sales Tax Reference Rates* from *TAX RATES*
- **READ** *Product Details* from *PRODUCT*
- **READ** *Customer Discount Category* information from *CUSTOMER*

Map data being retrieved (READ) from Persistent data to determine unique READS

= 3 unique READS = **Total =3 CFP**

Identify WRITEs to Persistent Data

- **WRITE** Order Header details to *Order Header*
- **WRITE** Order Item Details to *Order Line*

Map data being written (WRITE) to Persistent data to determine unique WRITES

= 2 unique WRITE = **Total =2 CFP**

Group Transient Data ENTERing Process - 3NF

Order Header Details Entered

Entering Process

1. Order Type	2. Date Required	3. Order Description
4. Contact Name	5. Additional Instructions	6. Delivery Address
7. Priority Flag		

Order Item Related Details Entered

1. Product Code	2. Quantity

Map data entering to Entities

Group Data entered into 3rd Normal form to get unique data movement ENTRIES

= 2 unique **ENTRIES** = **Total =2 CFP**

Group Transient Data EXITing Process - 3NF

Exiting Process

1. Order Number.	2. Division Invoice Address	3. Sales Tax
4. Order Description	5. Order Total	6. Order Date
7. Sales Tax Exemption Number		

✓

1. Product Description	2. Sales Tax Rate	3. Item Size
4. Unit of Measure	5. Price	6. Item Order Value

✓

1. Error / confirmation Message

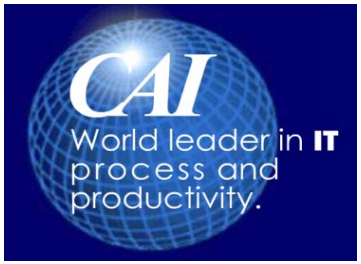
✓

Map data exiting to Entities

Group Data exiting into 3rd Normal form to get 3 unique data movement EXITS

= 3 unique EXITS = **Total =3 CFP**

Comparison of Functional Size Process Level



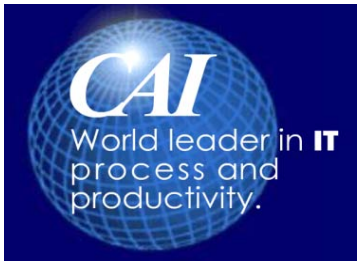
Size of Process

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 Customer	READ	1
Order	ILF	10		**Read Tax Rates**	READ	1
Customer	ILF	7		**Display Order Header Details**	EXIT	1
Product	ILF	7		**Display Order Item Details**	EXIT	1
Tax Rates	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

Similarities IFPUG and COSMIC

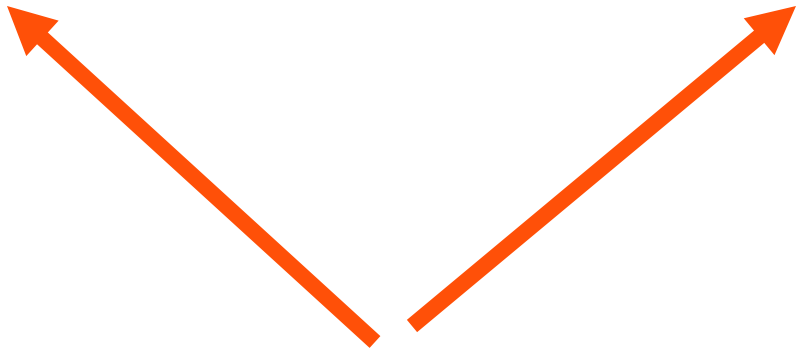


- **<u>Both</u> recognise:**
  - Elementary processes as a functional unit to be measured
  - data moving in/out of a process as contributing to functional size
  - data accesses to persistent data as contributing to functional size
- **<u>Both</u> DO <u>NOT</u> specifically measure:**
  - algorithms, processing logic, data transformations, calculations etc.

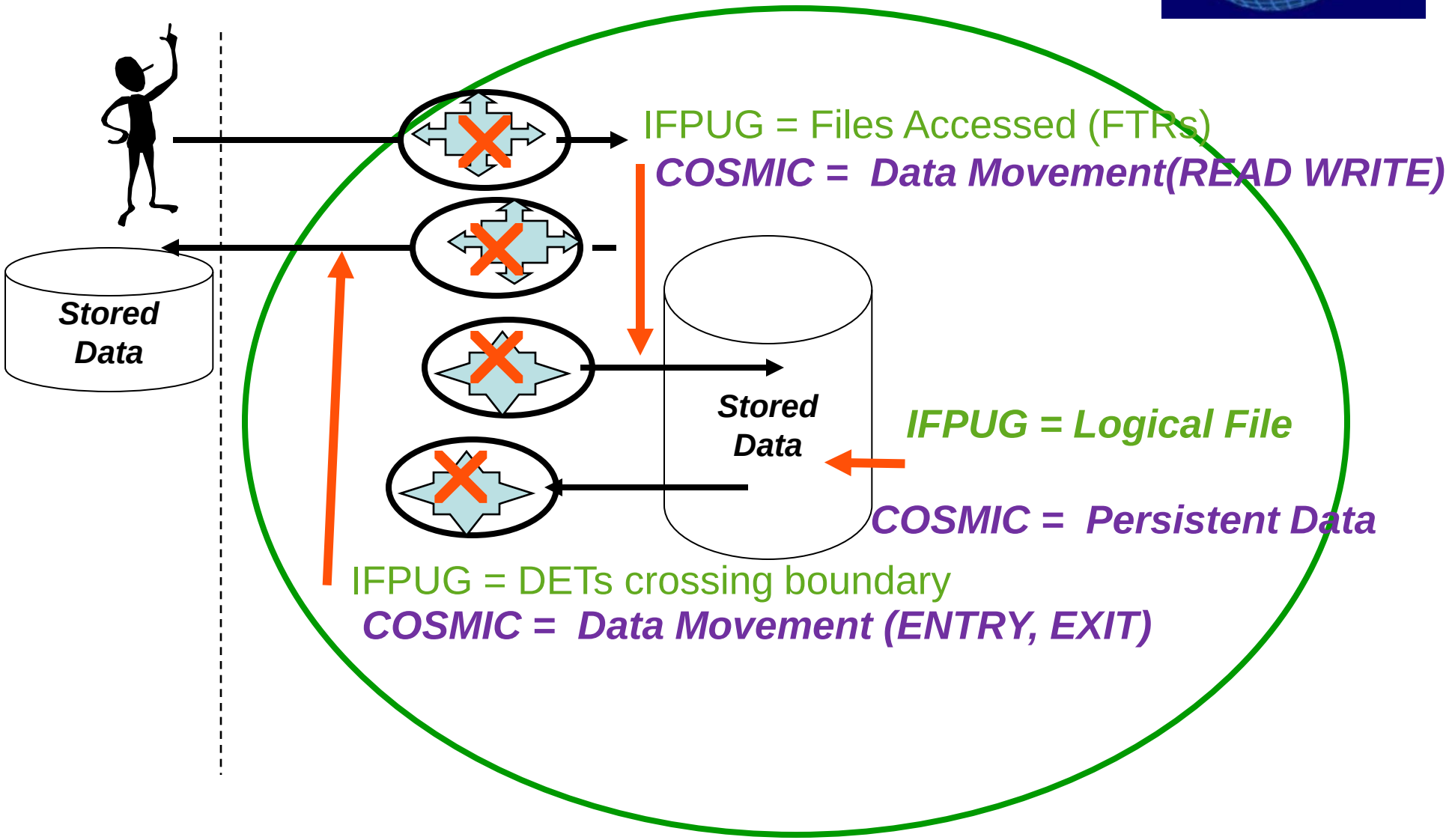
Comparison of Functional Size Application Level

"Order Processing System"

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



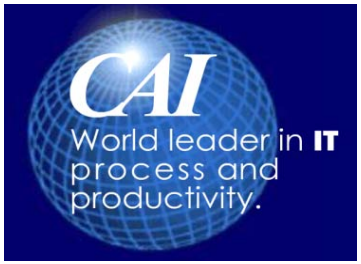
PROCESS


IFPUG = Files Accessed (FTRs)
COSMIC = Data Movement(READ WRITE)
Stored Data
Stored Data
IFPUG = Logical File
COSMIC = Persistent Data
IFPUG = DETs crossing boundary
COSMIC = Data Movement (ENTRY, EXIT)

Agenda

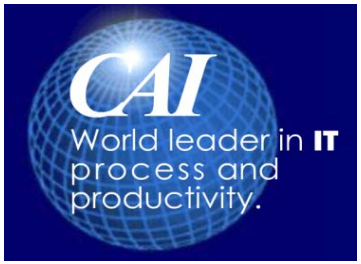
- History of Functional Size Measurement
- 14143-1 Definitions of Functional Size
- **Similarities and Differences**
- When to use what FSM Method

Concept Comparisons



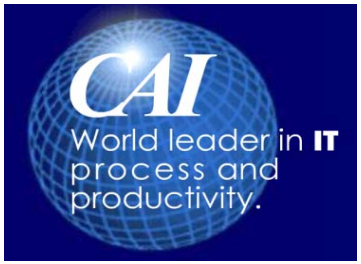
Concept	IFPUG	COSMIC
Methods for dealing with Multi-layered Software	-Not explicit in CPM -see New Environments white papers	-Explicit in rules for counting multi-layered architectures
User View	-Measures from External User View	- Measures functional users view
Quality and Technical Requirements	-Optionally measured as VAF in IFPUG 4.2 – not measured in ISO 20926 or 4.3	-Considered in other layers if implemented as - No VAF

Process Comparisons



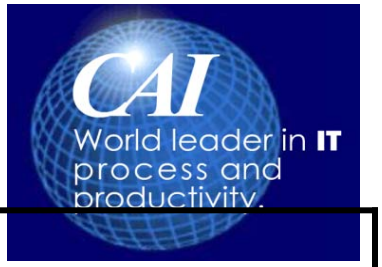
Process	IFPUG	COSMIC
- Count DETs	-No - just need to know 'ranges' of DETs	-No - counts 'logical groups' of DETs
- Industry default complexity data	-Yes, default EPs to average, DGs to low - + 15% error	-Industry data available, - error% not established
Rules for determining Complexity	-Different rules for each *type* of process	- Same Rules for *all* processes

Process Comparisons



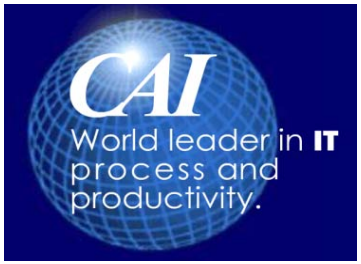
Process	IFPUG	COSMIC
- Repeatability of grouping Logical Data Groups	-Requires counting experience to ensure repeatability	-Requires Data Modelling experience to ensure repeatability
- Level of Detail required in functional Specifications	- not a lot of detail required since can select 'ranges' for complexity	-More detail required to identify each data movement and file access

Result Comparisons



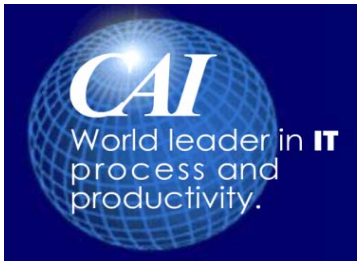
Process	IFPUG	COSMIC
- Correlation to effort across all functional domains	-MIS – significant supporting industry evidence -Limited– Realtime, scientific software data - ISBSG Special Reports	-Realtime – preliminary industry and research evidence ~100 projects -Limited - MIS data - ISBSG Special Report
- Industry Data	-public domain and private -ISBSG ~5000 projects	-Public domain and private -ISBSG – ~334 projects
-**International Certification**	- yes, 3 year renewal - high cost 3 years IFPUG membership plus fee -= ($185*3) +$250= $805 USD	- yes, only needs reviewing if Version changes - Low fee $100 USD

Result Comparisons



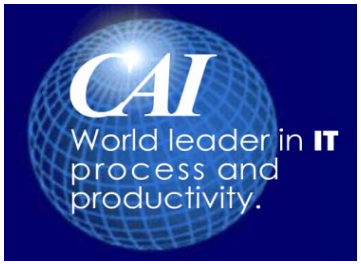
Process	IFPUG	COSMIC
-Sensitivity to large variations in process complexity	- maximum sensitivity is two fold variation ➢Min size = **3** FPs ➢Max Size = **7**FPs	-Allows infinite order of magnitude ➢Min size = **2** CFP ➢Max Size = **α** (infinite) CFP
-Sensitivity to processes which move a lot of data without accessing DGs	- highest size measure requires data movements AND data accesses	- highest size measure does not require process to have DG accesses.

Result Comparisons



Process	IFPUG	COSMIC
Data contribution to overall size	-Persistent Data contributes around 30% of total size in addition to contribution from process data accesses	- Persistent data only contributes to size via process accesses
-Counts multiple accesses to DG	- No - includes access to a persistent data group once only per process -Unique FTR	- Yes, includes access to a persistent data group up to twice per process (READ and/or WRITE)

Resource Comparisons



Resource	IFPUG	COSMIC
- Manuals	-Purchase from IFPUG -~390 pages -Purchase from ISO	-Download free from WWW -Purchase from ISO -~80 pages
- Training	-Many vendor courses worldwide -Certification	-Several Courses available worldwide -No certification
- Tools	-Variety Vendors -Certification	- Few Vendors -No Certification
- Case Studies	-2 different FUR Case Studies, -Purchase from IFPUG	-5 different FUR Case Studies -Download free

SO WHICH METHOD TO CHOOSE?

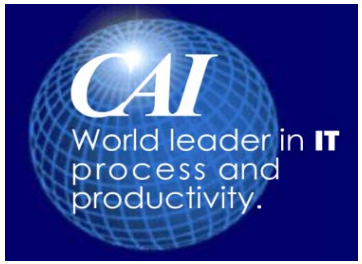
Consider

- need and 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**

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THANK YOU

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"To measure is to know!"

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