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FPA and other size metrics - the link

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EDS

EDS - Who we are

EDS has approximately 120,000 employees in 57 countries across the globe



EDS is a leading global technology services company delivering business solutions to its clients. EDS founded the information technology outsourcing industry more than 40 years ago. Today EDS delivers a broad portfolio of information technology and business process outsourcing services to clients in the manufacturing financial services, healthcare, communications, energy, transportation and consumer and retail industries and to governments around the world.

Agenda



- **Background – the Estimating Process and Sizing Methods**

- Function Point Analysis

- Other Sizing Processes – the Unit of Size

- Combining Unit of Size with Function Point Analysis

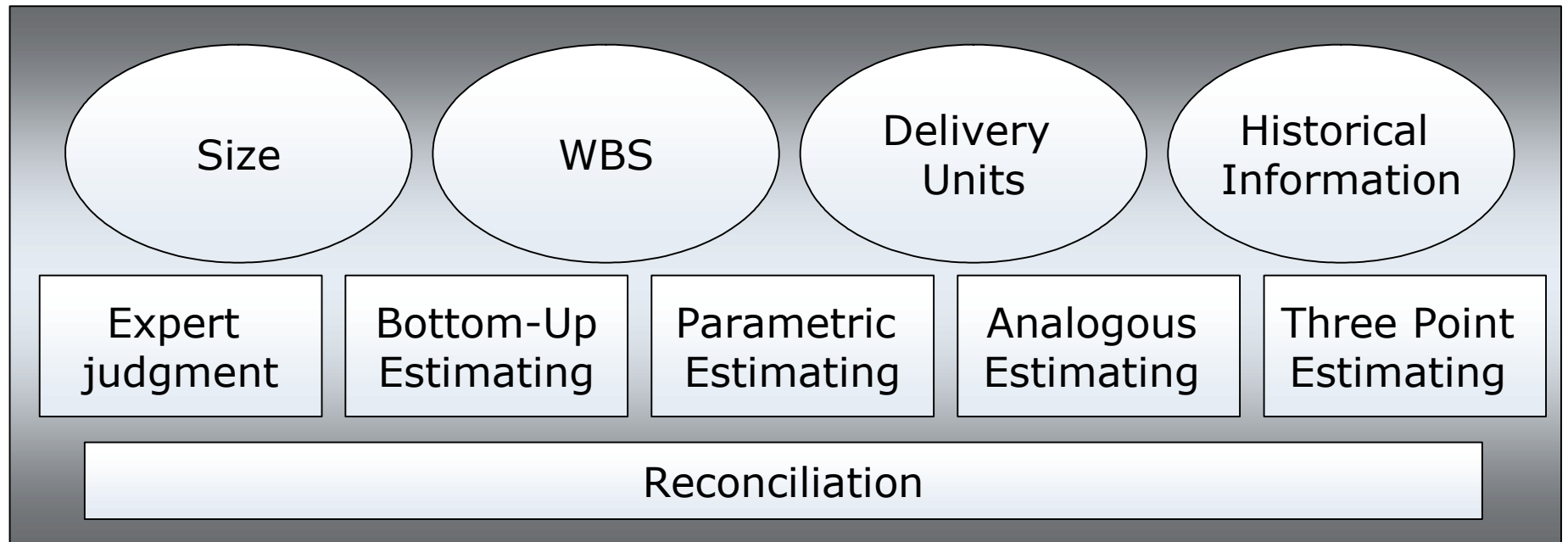
- Conclusions and questions

Estimating Process



The estimating process consist of some inputs, tools and techniques

A reconciliation of different estimates involving the estimator, the Project Manager and business and technical experts defines an agreed estimate



Sizing Options

- Function Points
 - Counted at Requirements, Design, Coding, Implementation
 - Consistent, Rules based, ISO standards
 - Basis for industry comparison
 - Function Point Analysis provides a good size measure that depicts the software requirements by functionality as recognized by the users.
- Source Lines Of Codes
 - Counted at end of Coding phase
 - Inconsistent, limited rules, not valid for comparisons across projects
 - Source Lines of Code is also a frequently used size measure, but has the disadvantage of being heavily technology dependent.

Both of these are recognized as industry benchmark size measures and should therefore be used in order to ensure sizing consistency across different projects.

Sizing consistency is also needed in order to utilize historical information and parametric estimating techniques.

Other Sizing options

- Unit of Size
 - Local size measure based on technical specifications
 - Consistent on project/application – inconsistent in organization/industry
 - Used to calibrate towards FP – and approximation FP
- Use Case Points
 - An industry standard for sizing Use Cases
 - Not often used in industry benchmarking
- Halstead/McCabe Complexity
 - Measures code density and complexity
 - Used for testing and code maintenance
 - Assessed at end of Coding phase
 - Tools that can create Halstead/McCabe Complexity often create a backfired “Function Point” report.

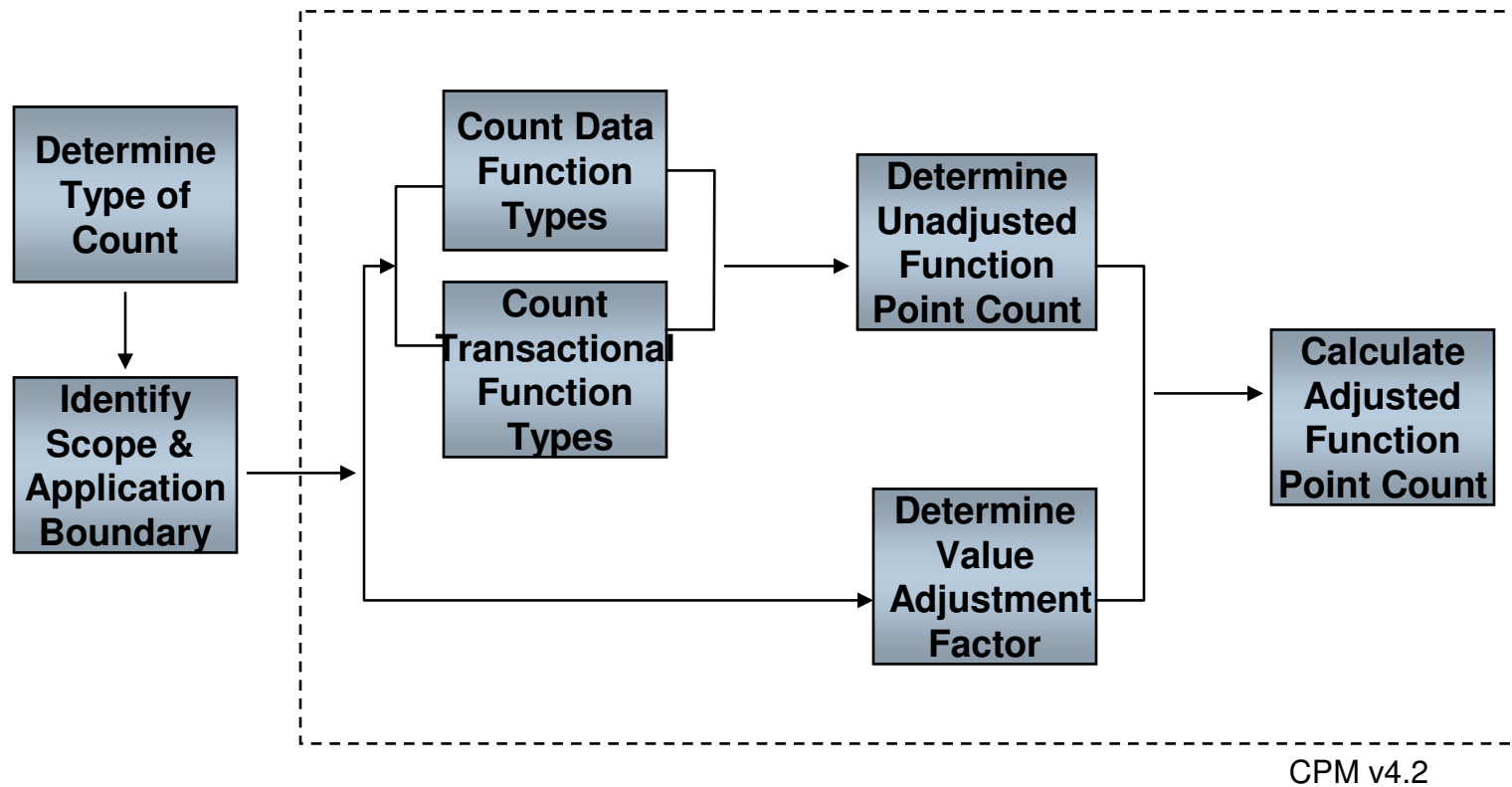
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A Closer Look at FPA

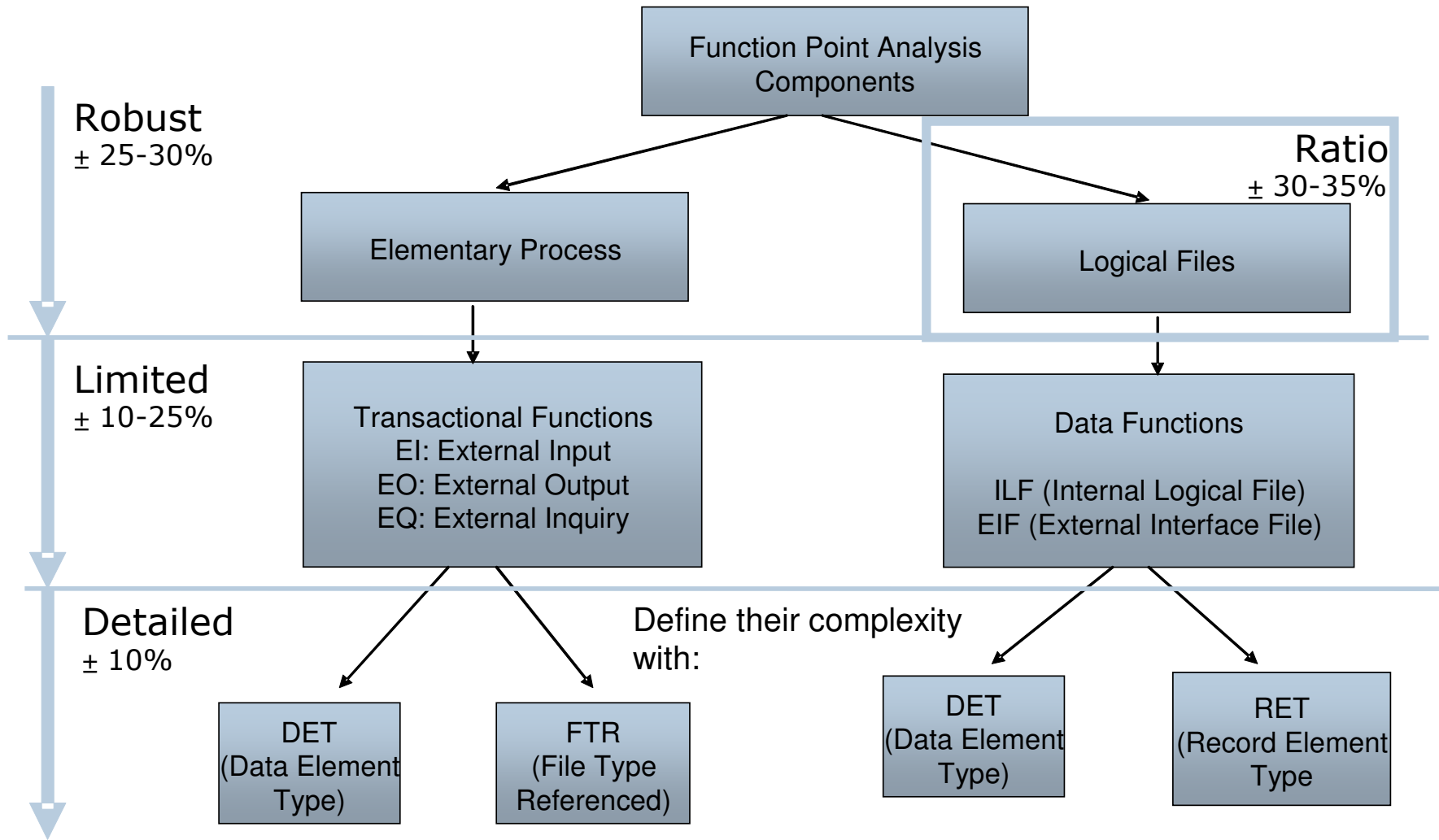
IFPUG Function Point Counting Process



Sizing - Using Function Point Analysis

- The accuracy of Function point size estimates depend on the methods used.
- Accuracy is improved with better documentation and greater levels of effort by the analyst.
- The following staged approach is appropriate depending on the needs of the client and PM.
- A four staged approach is used with accuracy increasing with each stage
 - The Ratio Approach uses the analogues technique, utilizing historical information such as 28 FP per Logical File or other Rule of Thumb techniques.
 - The Robust Approach identifies all transactions and translates them into logical transactions which can then be more accurately sized.
 - The Limited Approach identifies all transactions and assesses size and complexity by utilizing assumptions.
 - The Detailed Approach creates a full count using the methods defined in the IFPUG Counting Practice Manual all the way down to complexity rating.

FPA counting approach - and accuracy



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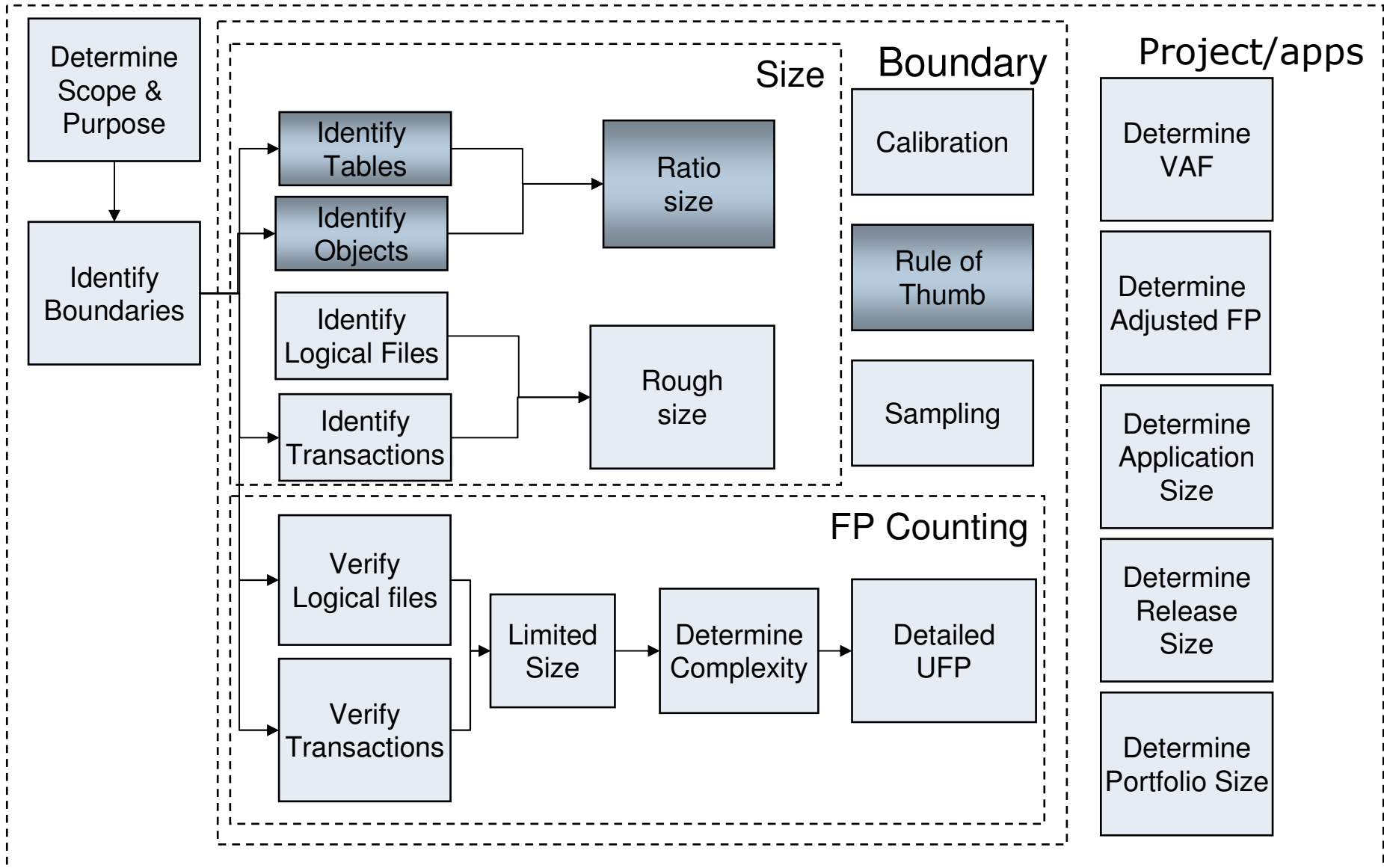


- **Other Sizing Processes – the Unit of Size**

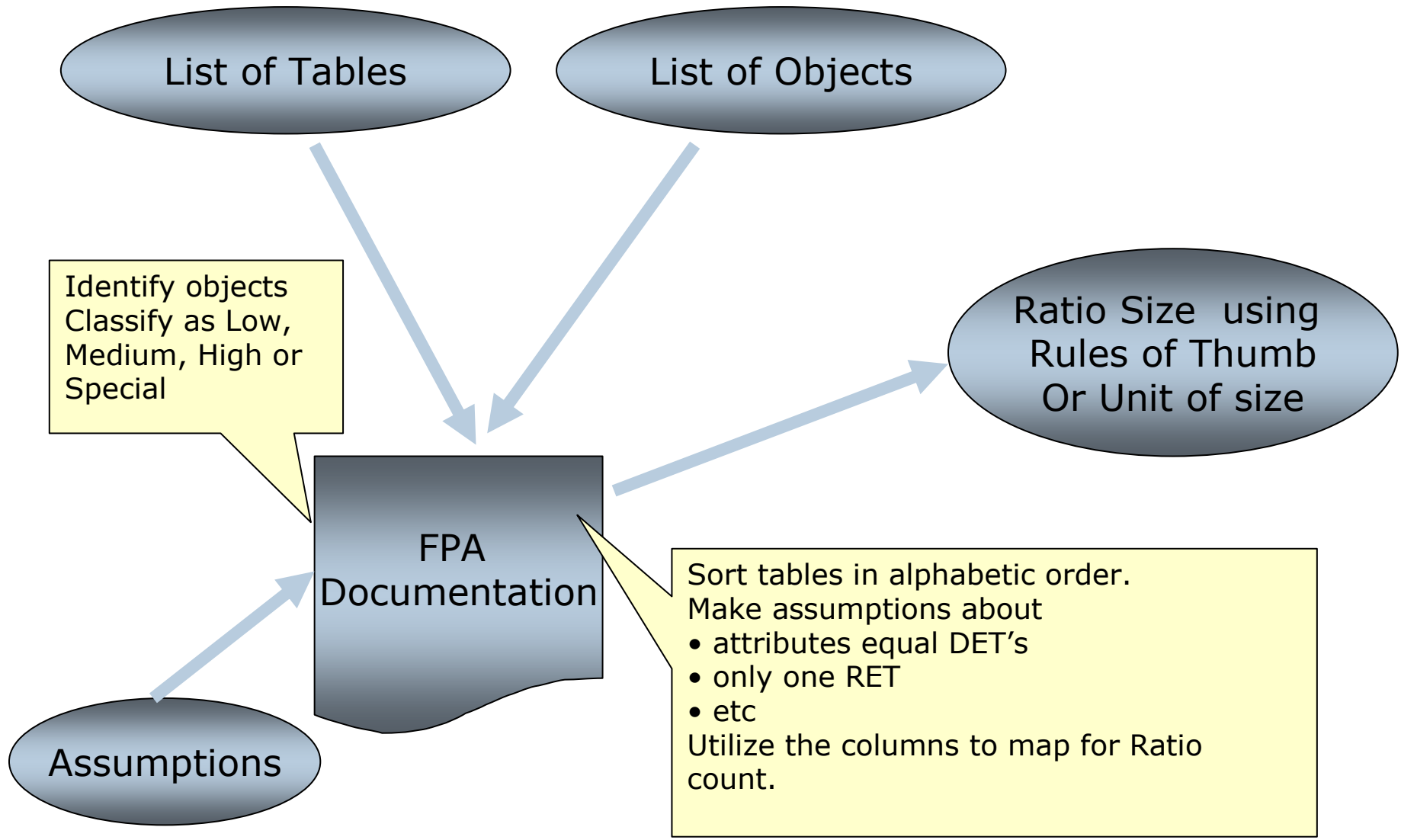
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Sizing Process



Ratio Process from tables to Size



Ratio Size - Using Rules of Thumb

DCG Rules from IFPUG 2002

- **Rule of 28**

$$FPC = \text{Data Stores} \times 28$$

- **Rule of 4**

$$FPC = 4 \times ((10 * ILF) + (7 * EIF))$$

Nesma – indicate FPA

- **Rule of 35 + 15**

$$FPC = ILF \times 35 + EIF \times 15$$

ISBSG Rules

- **Rule of 32**

$$FPC = \text{Data Stores} \times 32$$

- **Rule of distribution**

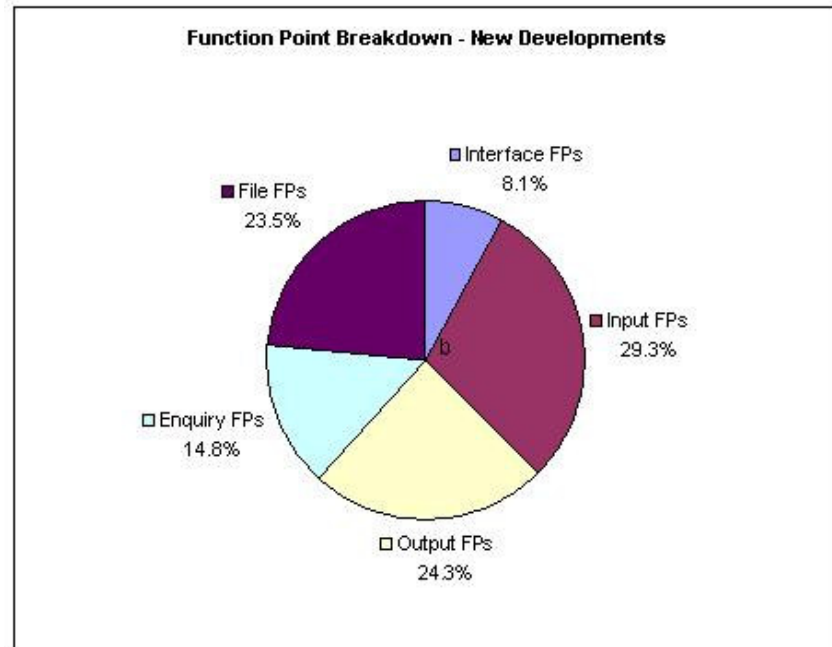
$$FPC = 7,3 \times \text{Data stores} * (100/23,5)$$

- Mean score for ILF's are 7,4 from ISBSG DB

EDS internal benchmark for Rule of Thumb

- **Rule of 31**

$$FPC = \text{Data Stores} \times 31$$



•ISBSG Distribution of elements

	New Development	Redevelopment	Enhancement
	Contribution to Size	Contribution to Size	Contribution to Size
ILFs	22,10%	23,00%	15,60%
EIFs	5,00%	2,50%	6,50%
EIs	33,50%	52,90%	32,70%
EOs	23,50%	17,50%	32,00%
EQs	16,00%	4,10%	13,20%

Ratio - Identify Objects

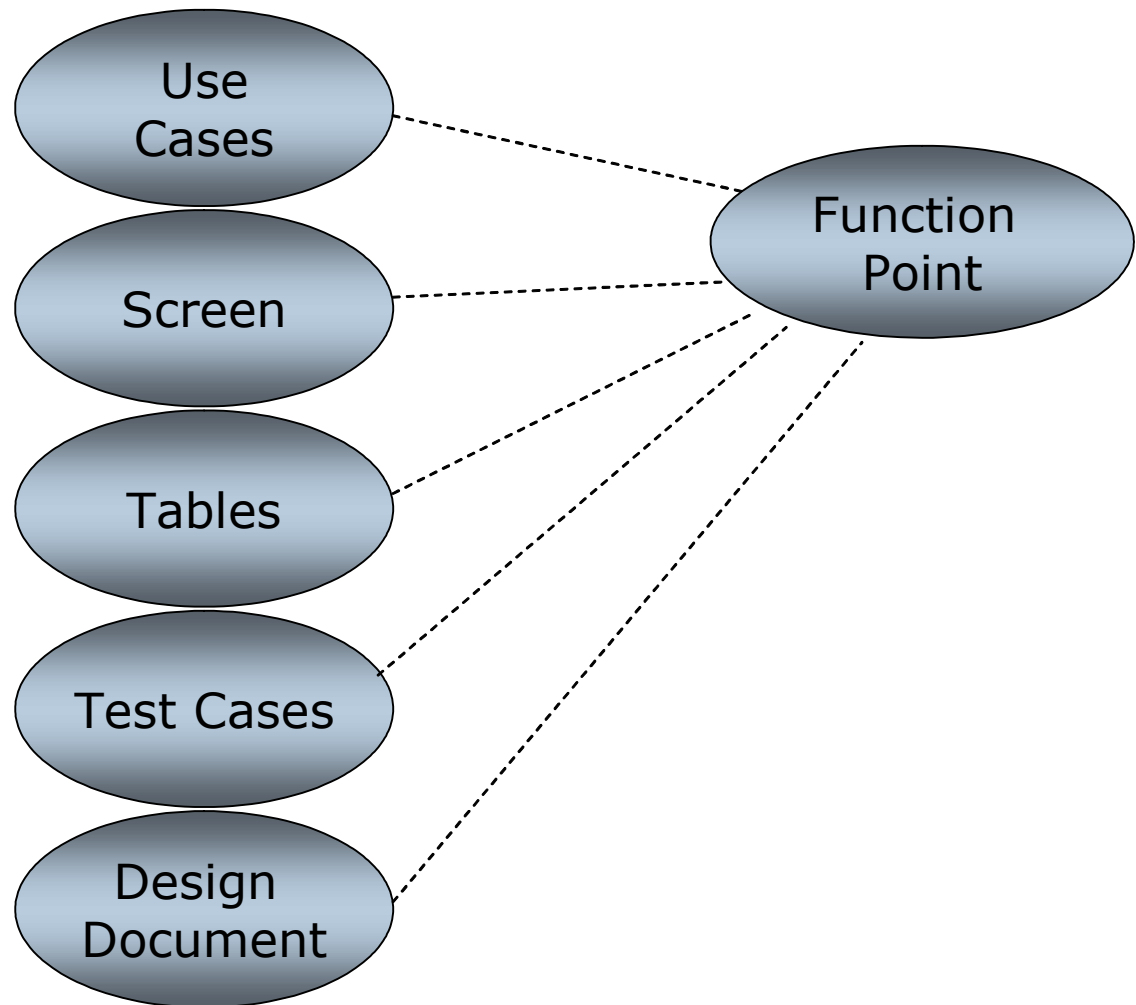
- Objects could be requirement documentation, CR's, Design documents, technical procedures, modules or the likes
- Classify the objects as Low, Medium, High or Special.
- Document assumption for when an object is Low, Medium, High or Special.
- Count objects by Low, Medium, High or Special.

Unit of Size - Using Delivery Units and FPA

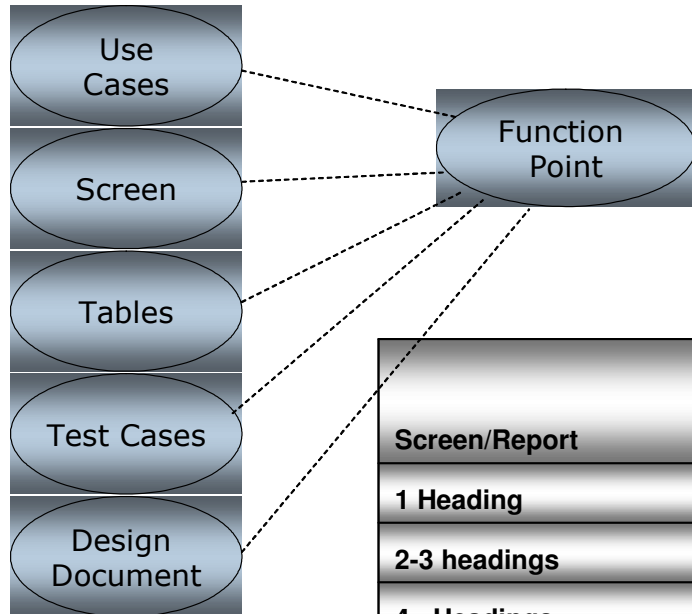
Delivery units are useful as a way determining size which is project specific.

Delivery Units and size are usually closely related.

Calibrate the link between the delivery units and the FPA



Delivery Units - Unit of Size information



	1-4 Fields	5-15 Fields	16+ Fields
Screen/Report			
1 Heading	Low	Low	Average
2-3 headings	Low	Average	High
4+ Headings	Average	High	High
Screen	Low	Average	High
UoS	18	23	30
Report	Low	Average	High
UoS	13	19	24

Recommended to remove any special – **Outliers** – Delivery Units that does not fit into the profile.

Ratio - Example of Tables

Comp	Maint Type	ID	SEQ	DESCRIPTION	Mult	Funct Type	DET	RET	L	A	H	Requirement References	Table / File References
				AUD_ADDRESS	0	ILF	15	1				Audit, History	
			001,	MTBL_HTTP_RETRY	0	ILF	3						
		001,		XHB_DISPLAY_TYPE	0	ILF	7	1				Code Data	
			001,	XHB_DISPOSAL	1	ILF	13	1	1			Use Case 200	
			001,	XHB_DISPOSAL2	0	ILF	13					Not uniq	

Assumption Reference Number	Assumption Status	Area of the system / Data Element, or Transaction affected	Description of Assumption
	Agreed with FP SME	Data elements	All tables with more than 4 attributes is assumed to be an ILF. The number of attributes is assumed equal to the DET's. All is assumed to have only 1 RET
	Agreed with Business Expert	AUD tables	AUD tables are used for audit and history tracking of the changes that are done in the system. These tables are not uniq and are not part of the FPA. This is agreed with CCC, XXX
	Agreed with Business Expert	MTBL tables	MTBL tables are technical tables that are used by as a part of the technical setup of the system. These are technical requirements rather than user defined requirements. This is agreed with CCC, XXX
	Awaiting Review	Tables with the word Type	Tables that include the word Type are considered Code tables. These are not counted, but are registered as Contributing size measure for maintenance

Ratio - Example of Objects

Document assessment in FPA Spreadsheet

Comp	Maint Type	ID	Compl	SEQ	DESCRIPTION
			Low	001,	<i>Create Court Log Entry UCR</i>
			Special	001,	<i>Export Event UCR</i>
			Medium	001,	<i>Maintain Court Log Entries UCR</i>
			High	001,	<i>Maintain Court Log Entry (Appeal) UCR</i>
			High	001,	<i>Maintain Court Log Entry (Bail and Custody) UCR</i>

Document summary in Sample Spreadsheet

ID	Component Name	Sample Multipl	Component Type	Work Type	Complexity	Language/ Tool
	High complexity - sample	14	Use Case	Define	High	
	Medium complexity	19	Use Case	Define	Medium	
	Simple complexity	128	Use Case	Define	Low	
	Special	1	Use Case	Define	Special	

Ratio Size- Rule of Thumb example

Approx	Data Element	Multiplier	DET	RET	Type
1	Employee		14	1	ILF
0	TX400		2	1	ILF
1	Organisation		5	1	ILF
0	Country		2	1	ILF
1	Job-describtion		10	1	ILF

Assumption:

Less then 3 DET's is a control file

Issue:

Accuracy of the approximation might not be good enough

Identification only based on technical Solution

Use DCG Rules from IFPUG 2002

Rule of 28

$$FPC = \text{Data Stores} \times 28$$

Rule of 4

$$FPC = 4 \times ((10 * ILF) + (7 * EIF))$$

The approximation gives you the Possible valid data elements.

Rule 28	Size
3*28	84

Ratio - Example without table information

	ISBSG Redevelopment Contribution to Size	My Project UFP	Ratio size
ILFs	23%	?	613
EIFs	3%	?	80
EIs	53%	2000	1413
EOs	18%		480
EQs	4%		107

- Example where it is only possible to utilize a Rule of Thumb or Unit of Size on the transactions.
- In that case use the contribution to size
- Remember to calibrate your own contribution of size to validate these assumption when the Detail FPA has been completed.

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Unit of size in combination with FPA

- Documentation of the Unit of Size can be a very good starting point for later Function Point Analysis.
- Documentation of Unit of Size are easily tracked by Project team.
- A valuation of the predicted size that might have been a guesstimate
- Ratio size as input to re-estimation of the effort and duration for the FPA

Estimating accuracy using UoS

Count Type	Accuracy (+/-)	Cost
IFPUG FP	5%	1-3 Days
IFPUG - Limited	25%	1-3 Days
Approximation	35%	½ Day
Ratio	50%	<½ Day
Expert	50%	< ½ Day
Delphi	100%	< 1/4 Day
Backfire	100-400%	Varies

Source: The David Consulting Group, Inc.

- Ability to specify when a full FPA is needed - Expected – less cost
- UoS - Accuracy of 30-35%
- Accuracy will be improved by calibration during the life cycle of the project
- Best accuracy is to complete a Function Point Analysis.

FPA, Unit of Size and the Project Life Cycle

Phase	Sub-process	Size Process
Define	High-level Requirement	Organizational UoS or Rules of Thumb
Define	Detail Requirement	FPA
Define	Baseline	Consolidate the FPA count with PM
Define	Create Project UoS	Use Combination of FPA and UoS. Define boundary for UoS to assess FP Size
On-Going	Change Request	Project UoS
Re-planning	Replanning Trigger. Reconcile against Project UoS	FPA
Analyze	Plan for Analyze	Use Triggers like $UoS/FP * \%effort = completed\ size$
Analyze	Check point	Reassess changes and estimates
Design	Plan for Design	Use Triggers like $UoS/FP * \#expected\ designs = Completed\ Size$
Design	Check Point	FPA Design against Requirements. Scope change measure
Design	Baseline	Consolidate the FPA count with PM
Unit Test	Plan for Unit Test	Use Triggers like $UoS/FP * Test\ Cases$
Integration test	Plan for Integration	Use Triggers
Acceptance test	Prepare for rework	$UoS/FP * \#Defects$ $UoS/FP * \#CR's$
Acceptance test	Check Point	FPA and Org. And Project UoS Application Size, reconcile quality of UoS for all Project, Reconcile insecurity
Close-down	Organizational UoS Change Request	Is there a need to update organization UoS

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Conclusions

- Function Point Analysis is the industry standard for sizing projects and applications
 - While it is accurate, it is time consuming in day to day work such as high level estimating and scope management
 - There is a method which helps link the day to day with the true size measure
- There are a number of straightforward ways for estimating size which give an indication of scope of a project
 - These are less accurate than FPA and they are most useful within the project for which they are defined
 - They can be used in high level estimating and tracking scope and change
 - They are useful triggers to when a Function Point Analysis and the estimate it supports will need to be revisited

The background features several overlapping light blue papers, each with a large black question mark. A silver wire clip is visible in the lower right corner, holding one of the papers. The overall color palette is a cool, teal-blue.

Questions?

Contact Information

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