

# FP Lite™ – Is It A Statistically Valid Method Of Counting?

NJ SPIN 2006



The David Consulting Group  
*Achieving Software Excellence*

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# Cost Benefit Analysis

IT cost management strategies typically require an ROI analysis

## Difficulties with ROI:

- Intangible benefits to the business are difficult to measure
- Tangible benefits are not often achieved
- Related project costs are often inaccurately forecast

# Basic Elements of IT Cost Management

IT performance may be evaluated based upon two aspects of cost management

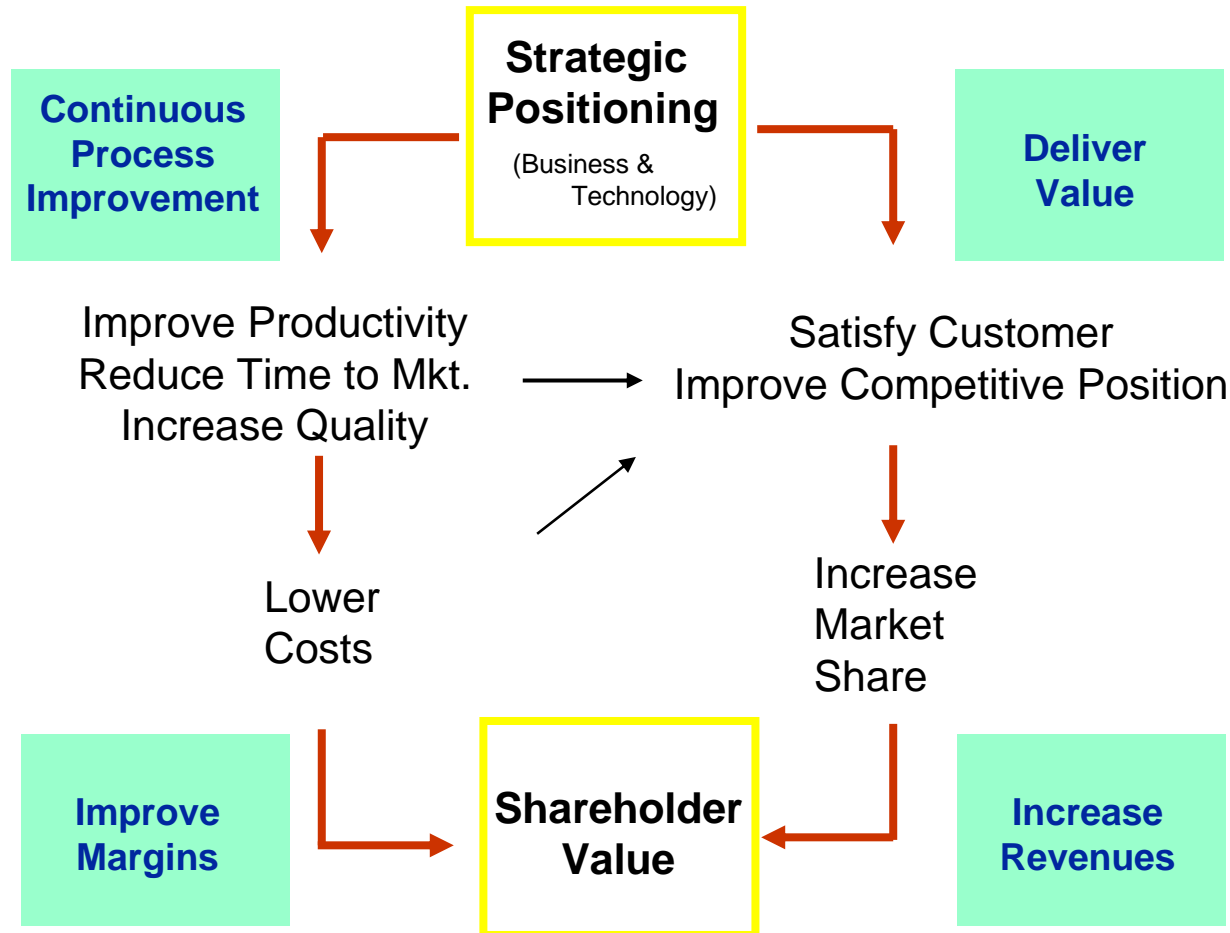
- IT must show value being delivered; e.g., how business will achieve increased revenue/profit
- IT must show improved performance; e.g., reduced organizational costs, improved quality

# Navigating Through IT Cost Management

Effective IT Cost Management requires knowledge in two areas –  
what does it cost, what is the value

- Cost per unit of work
  - Size of deliverable
  - Resources required to deliver
- Value proposition to the user (measured value of the deliverable)
  - Quality of the deliverable
  - Functionality delivered that benefits the organization

# Managing Cost, Driving the Business



# The Need for Sizing

Organizations focused on managing costs and improving IT performance must rely on measured outcomes. Typical measures include cost, time to market and quality. Accurate evaluation of these measures must include size as the common denominator. Without size, a relative value can not be established.



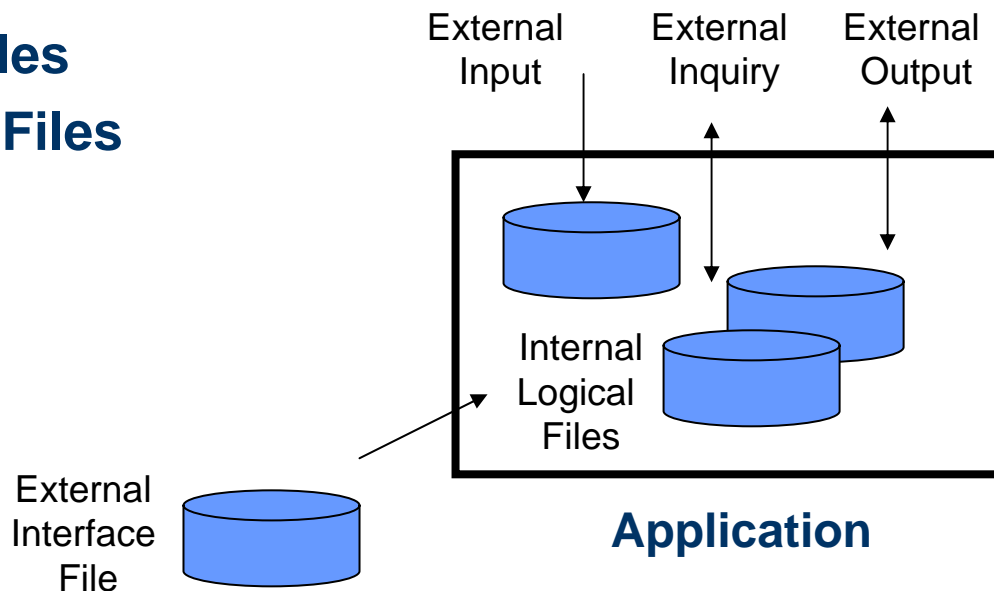
# Characteristics of an Effective Sizing Metric

- Meaningful to both developer and business user
- Defined (industry recognized)
- Consistent (methodology)
- Easy to learn and apply
- Accurate, statistically based
- Available when needed (early)

# The Function Point Methodology

Five key components are identified based on logical user view

- **External Inputs**
- **External Outputs**
- **External Inquiries**
- **Internal Logical Files**
- **External Interface Files**



# The Function Point Methodology

Each identified component is assigned a Function Point size value based upon the make-up and complexity of the data

Components:	Complexity			Total
	Low	Avg.	High	
Internal Logical File (ILF)	___ x 7	___ x 10	___ x 15	___
External Interface File (EIF)	___ x 5	___ x 7	___ x 10	___
External Input (EI)	___ x 3	___ x 4	___ x 6	___
External Output (EO)	___ x 4	___ x 5	___ x 7	___
External Inquiry (EQ)	___ x 3	___ x 4	___ x 6	___
<b>Total Unadjusted FPs</b>				___

**Data Relationships** {  
 Record Element Types or File Types Referenced

**Data Elements (# of unique data fields)**

Low	Low	Average
Low	Average	High
Average	High	High

# The Function Point Methodology

## General System Characteristics

Data Communication	On-Line Update
Distributed Data Processing	Complex Processing
Performance Objectives	Reusability
Heavily Used Configuration	Conversion & Install Ease
Transaction Rate	Operational Ease
On-Line Data Entry	Multiple-Site Use
End-User Efficiency	Facilitate Change

**An assessment of the  
General Systems Characteristics results in a  
Value Adjustment Factor (VAF)**

**Final Calculation:**

**Total Unadjusted FP X VAF = Final Count**



# Managing IT Costs Using Function Points

Once Functional Size has been determined, IT performance can be evaluated regarding:

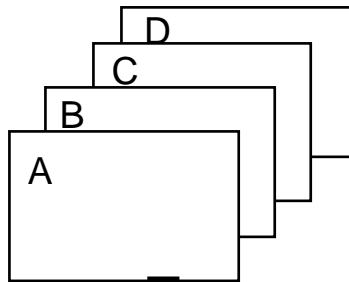
- **Value delivered to the business;**  
e.g., how business will achieve increased revenue/profit
- **Improved IT performance;**  
e.g., reduced organizational costs, improved quality



# Baseline Data Measures Performance

## CUSTOMER

### Product Deliverable



### FUNCTIONALITY DELIVERED

Business Value  
Operational Efficiency  
Ability to Compete  
Customer Satisfaction

## IT

### Performance Indicators

Functional Size  
Duration  
Cost  
Quality



### PRODUCTIVITY MEASURES

Delivery Rate  
Time to Market  
Cost per Unit of Work  
Defect Density

### Industry Baselines

Average and Best in Class Performance Levels



### COMPARATIVE ANALYSIS

Performance Comparison  
Identification of Risks  
Profile of Performance  
Best Practices Identification



# Evaluating Performance Without Size

Project	Cost (000's)	Quality (Defects Released)
PO Special	\$500	12
Vendor Mods	\$760	18
Pricing Adj.	\$ 40	5
Store Sys.	\$990	22

# Evaluating Performance With Size

Project	Size	Cost (000's)	Rate	Quality (Defects Released)	Density
PO Special	250	\$500	\$2,000	12	.048
Vendor Mods	765	\$760	\$ 993	18	.023
Pricing Adj.	100	\$ 80	\$ 800	5	.050
Store Sys.	1498	\$990	\$ 660	22	.014

**Size --- Function Points**  
**Rate --- Cost per Function Point**  
**Density -- Defects per FP**

# The Benefit of Sizing

- Quantitative (Objective) Measure
- Basis for Comparison - Industry
- Manage Expectations (Perceived Customer Value)
- Satisfies Software Process Improvement Requirements

# Common Criticisms of Function Points

- FP methodology terms are confusing
- Too long to learn, need an expert
- Need too much detailed data
- Does not reflect the complexity of the application
- Takes too much time
- We tried it before

# Simplifying the Methodology

- Definitions - Make them more user friendly
  - External Input ⇒ **Input**
  - External Output ⇒ **Output**
  - External Inquiry ⇒ **Inquiry**
  - External Interface Files ⇒ **Interfaces**
  - Internal Logical Files ⇒ **Data Stores**

# Simplify the Methodology

- Assume Average

## Complexity

Components:	Low	Avg.	High	Total
Data Stores	__ x 7	__ x 10	__ x 15	___
Interfaces	__ x 5	__ x 7	__ x 10	___
Inputs	__ x 3	__ x 4	__ x 6	___
Outputs	__ x 4	__ x 5	__ x 7	___
Inquiries	__ x 3	__ x 4	__ x 6	___
<b>Total Unadjusted FPs</b>				___

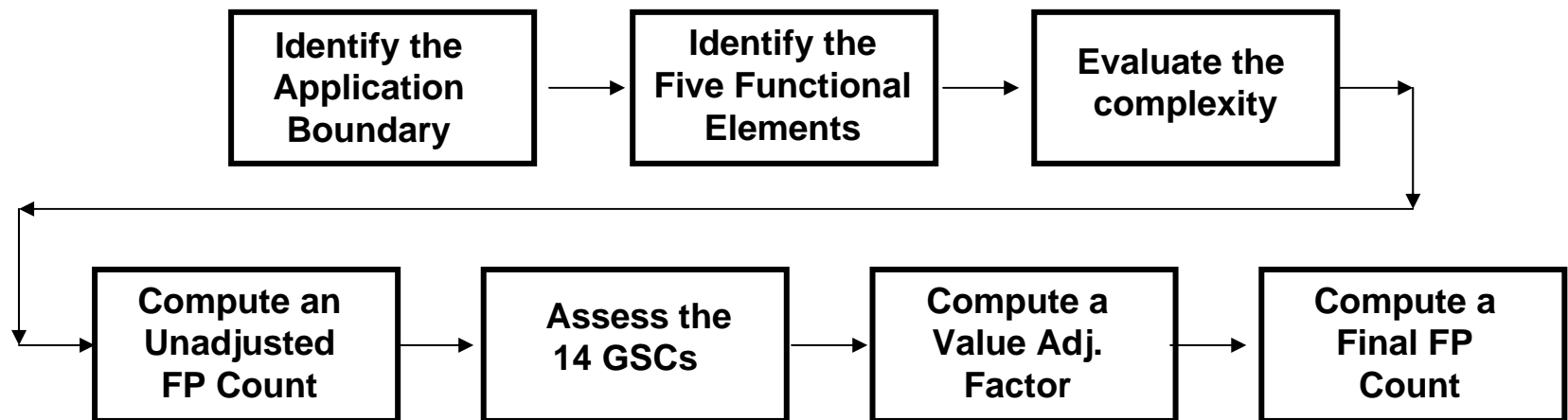
# FP Lite™ Impact Analysis

What is the impact on size accuracy when performing a FP count that assumes everything is of average complexity?

Use FP Lite™ when:

- You don't have enough detail data to determine the complexity
- You don't have the time to perform a full count
- You don't have the skill (or motivation) to perform a full count

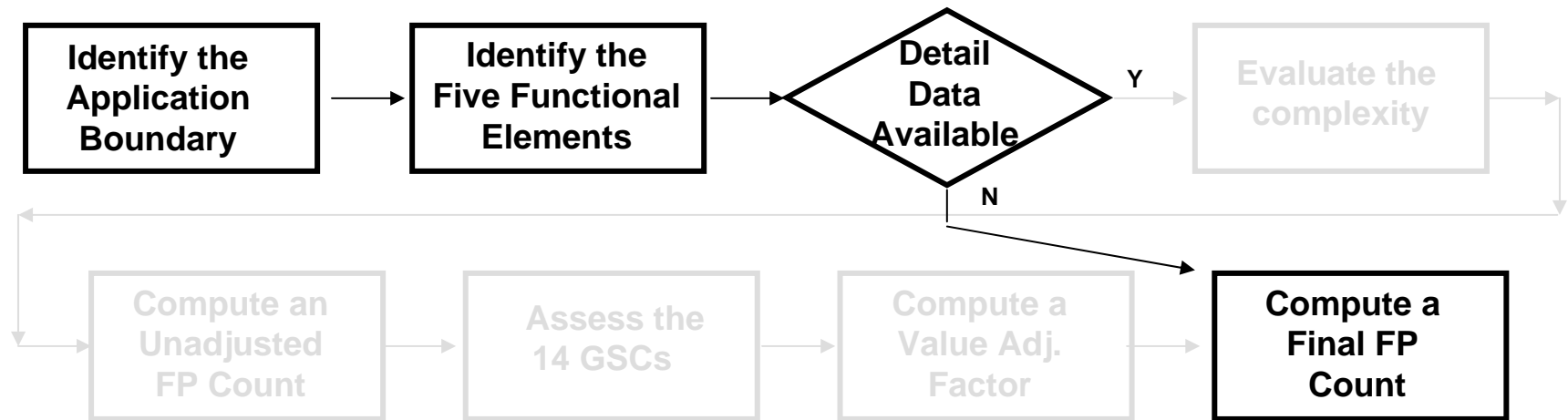
# The Counting Process





# FP Lite™ Counting Process

FP Lite™ requires only 3 steps



# The Study

The intent of the study was to determine -

- What is the statistical variability between a full count and FP Lite™ count
- What is the effort involved for a full count vs. a FP Lite™ count

Approach -

- Collected data from two separate sources
- Counts were performed by experienced function point counters all counting consistently
- Counts were randomly selected from a larger group of counts

# Entity Variability

Comparing the variability among low, average and high values.

## PROFILE

FP Entities	Low	Var.	Avg.	Var.	High
EI	3	+33%	4	-33%	6
EO	4	+25%	5	-28%	7
EQ	3	+33%	4	-33%	6
ILF	7	+42%	10	-33%	15
EIF	5	+40%	7	-30%	10
	22	+36%	30	- 31%	44

# Project Profile Data Group 1

## PROFILE

30 Enhancement projects from (30) different applications

### Size

0 - 50 fps	11	Smallest	3
51-150 fps	10	Largest	1,916
Over 150 fps	9	Average Size	198.47
	30		

### FP Entities

EI	37%
EO	20%
EQ	16%
ILF	24%
EIF	3%
	100%

### Platform

Client Server	14
Web	6
Mainframe	9
PC	1

# FP Lite<sup>TM</sup> Statistics Group 1

Assumption: Statistics based on Adjusted function points.

## All Projects

Detail Count	5954 FPs
FP Lite <sup>TM</sup>	5471 FPs

## Variance\* at the Project Level

Range	Extreme		Median	
	Low	High	Low	High
All Projects	-23.69%	32.16%	-8.90%	12.90%
0 - 50 fps	-21.42%	32.16%	-8.62%	26.07%
51-150 fps	-23.69%	19.72%	-10.22%	12.23%
Over 150 fps	-22.77%	4.18%	-8.91%	3.65%

\*Variance expresses the performance of FP Lite<sup>TM</sup> relative to the actual count.

# Project Profile Data

## Group 2

### PROFILE

95 Enhancement projects from (70) different applications

#### Size

0 - 50 fps	0	Smallest	52
51-150 fps	44	Largest	1,572
Over 150 fps	51	Average Size	207.70
	95		

#### FP Entities

EI	32%
EO	27%
EQ	19%
ILF	17%
EIF	5%
	100%

#### Platform

Client Server	61
Web	25
Mainframe	9
PC	0

# FP Lite™ Statistics Group 2

Assumption: Statistics based on Adjusted function points.

## All Projects

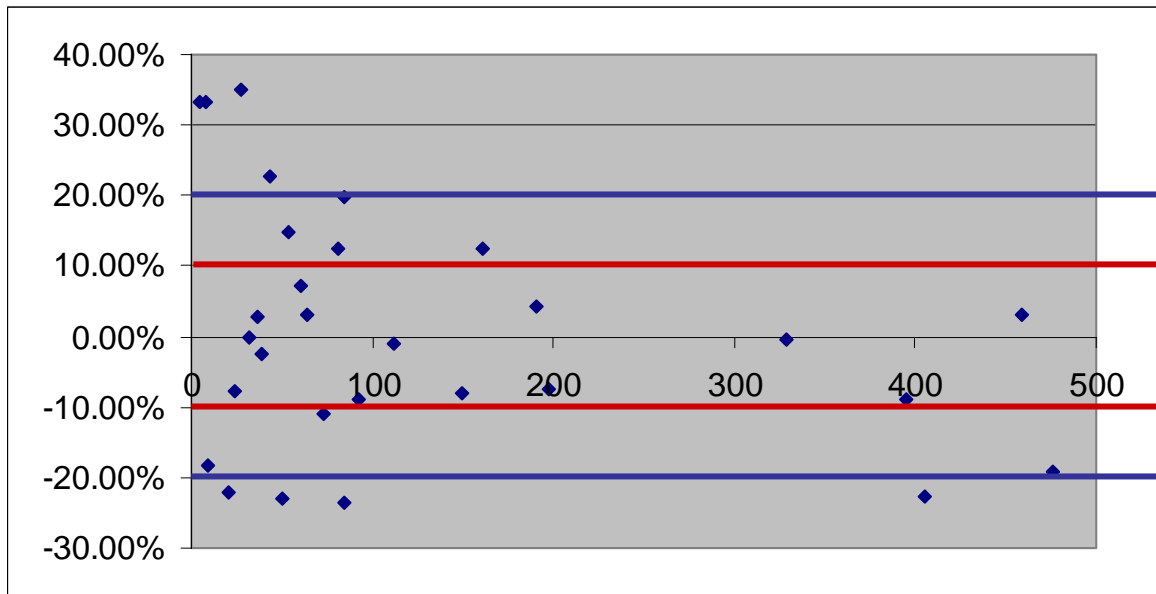
Detail Count	19733
FP Lite™	17738

## Variance\* at the Project Level

Range	Extreme		Median	
	Low	High	Low	High
All Projects	-33.04%	25.81%	-16.21%	11.32%
0 - 50 fps	-----	-----		
51-150 fps	-33.04%	18.44%	-14.17%	11.32%
Over 150 fps	-32.82%	25.81%	-16.73%	10.41%

\*Variance expresses the performance of FP Lite™ relative to the actual count.

# Group 1 – Range Analysis



## Group 1

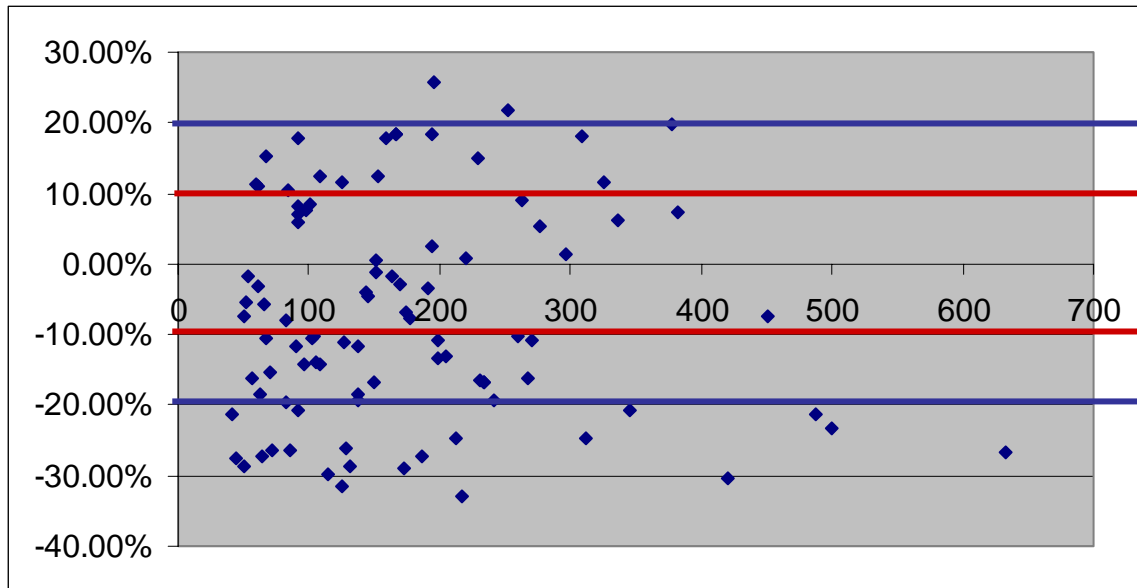
47% were less than +/- 10%

74% were less than +/- 20%

26% were greater than +/- 20%



# Group 2 – Range Analysis



## Group 2

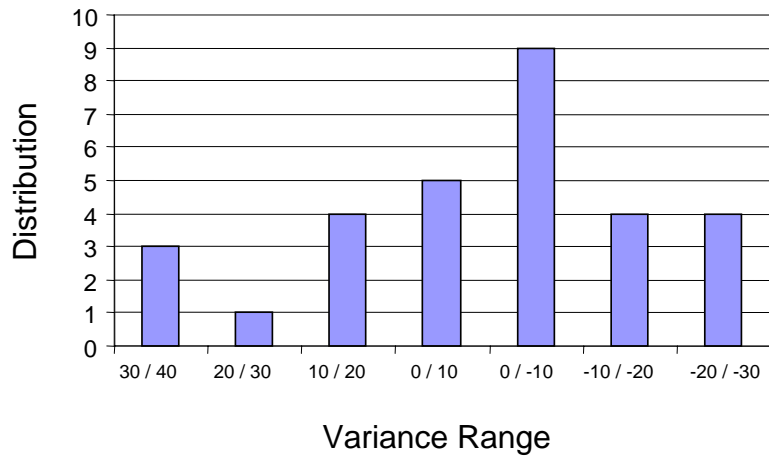
30% were less than +/- 10%

75% were less than +/- 20%

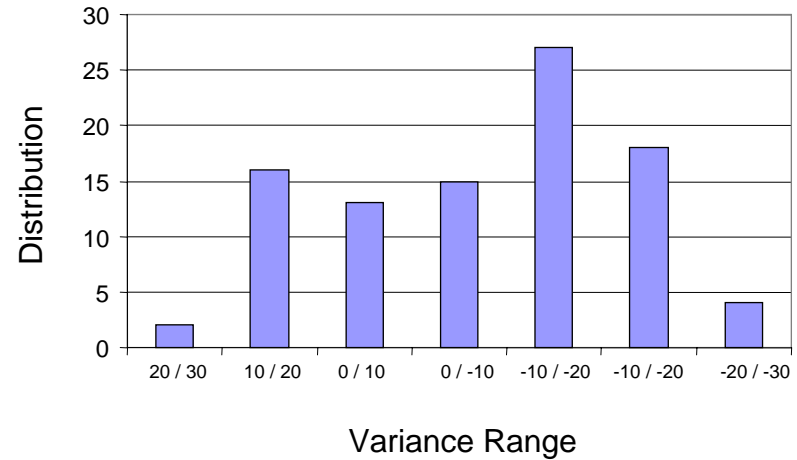
25% were greater than +/- 20%

# Distribution Analysis

Group 1



Group 2



# Level of Effort

Question - How much time is saved by using FP Lite™?

Surveyed 9 CFPS Counters. Data points reflect their notional view of how much time it takes to count various sized projects

Results:

Size	Effort (hrs.)		Productivity
	FPA	FPL	
<50	2.5	2.0	20.0%
50 – 150	4.3	3.5	18.6%
>150 < 300	8.8	5.5	37.6%
300 – 650	13.9	9.6	30.9%
>650 <1000	20.8	14.3	31.3%

# Initial Observations

- With FP Lite<sub>TM</sub> the variance tends to decrease as the size of the project increases
- Size counts under 50 FPs may have a higher variance
- Numerous changes to certain elements may have an impact variability
- 70 +% of the FP Lite<sub>TM</sub> estimates were within +/- 20% of actual. Conversely, 30% of the time FP Lite<sub>TM</sub> sizings were no greater than +/- 40%
- GSCs were not statistically significant relative to the results of the final count
- Using the FP Lite<sub>TM</sub> approach may be more productive

# Why Sizing is Important

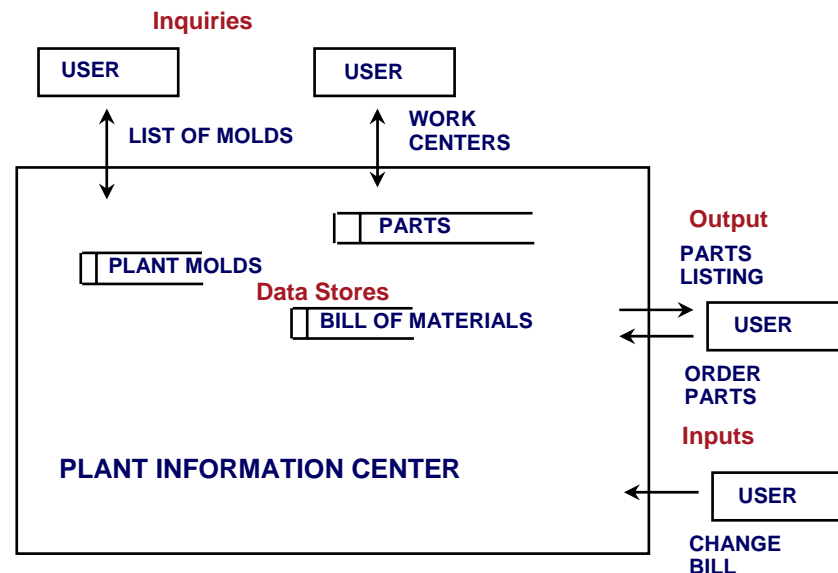
- Requirements – An ability to evaluate the size of the requirements based upon functionality being requested
- Estimation – Size is a key variable required to effectively estimate the level of effort
- Process Improvement – Requires a consistent sizing measure to be used as the basis for comparing levels of performance
- Change Control – A repeatable, consistent size measure is necessary to properly manage client expectations



# Requirements Gathering

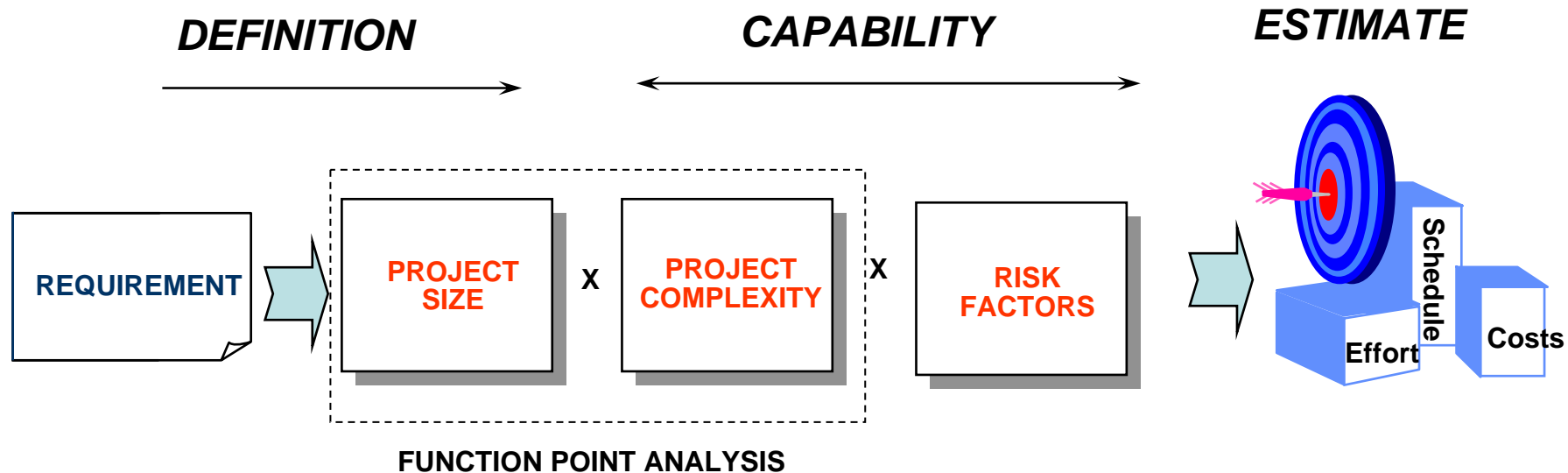
The FP Lite™ method of sizing can be used early in the lifecycle to generate a preliminary size useful in managing the scope of the project.

Element	Value
Inquires (2)	8
Inputs (1)	4
Outputs (1)	5
Data Stores (3)	30
<b>Total Size</b>	<b>47</b>



# Estimating

FP Lite™ can be an effective sizing vehicle to be used in early lifecycle estimates



# No Excuse not to Size

- FP Methodology terms are confusing

*Simplify the terms, easy to understand*

- Too long to learn, need an expert
- Need too much detail data
- Does not reflect the complexity of the application
- Takes too much time

*Use FP Lite™ !!*

- “We tried it before”

*Well, try it again!!*