

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

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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

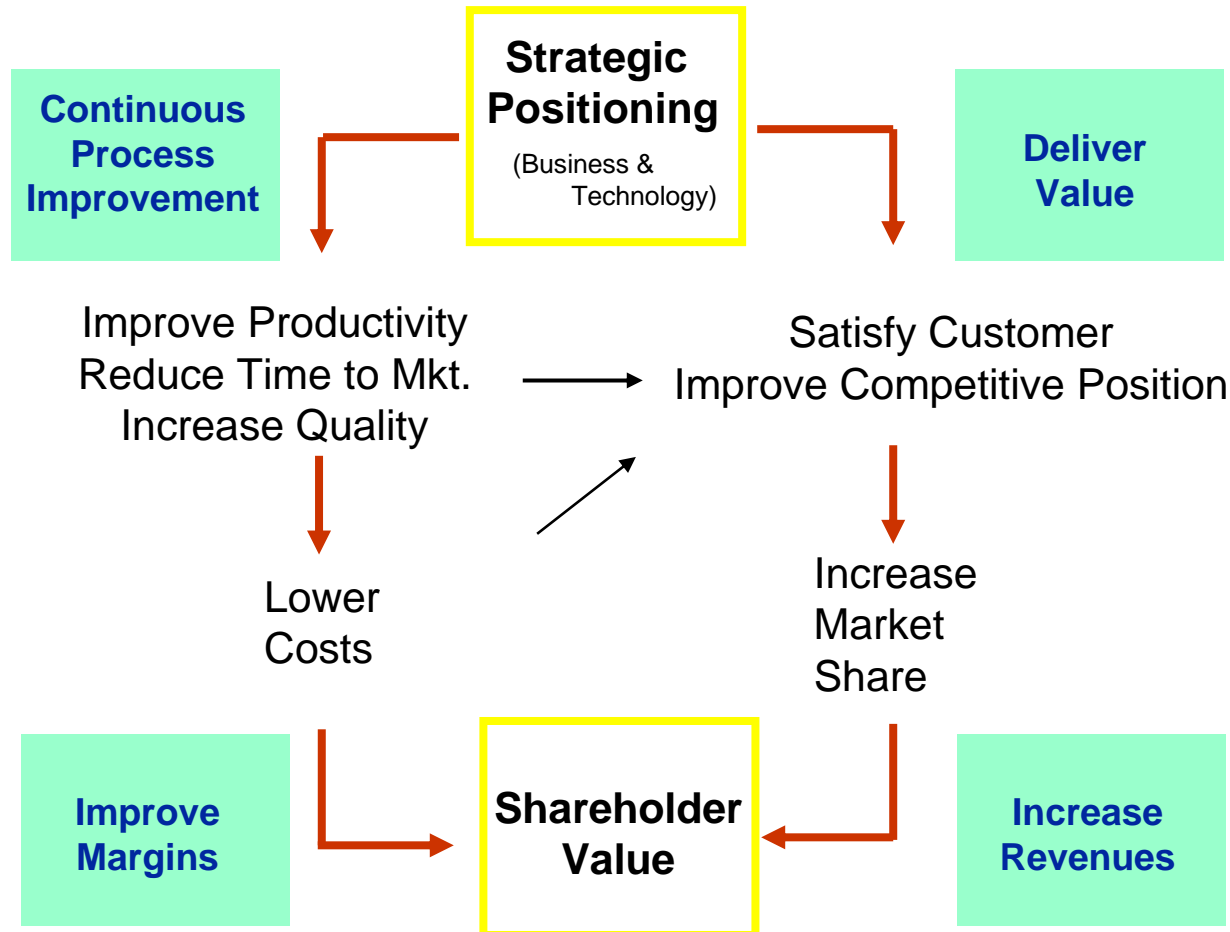
- IT must show value being delivered; e.g., how business will achieve increased revenue/profit
- IT must show improved performance; e.g., reduced organizational costs, improved quality

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.

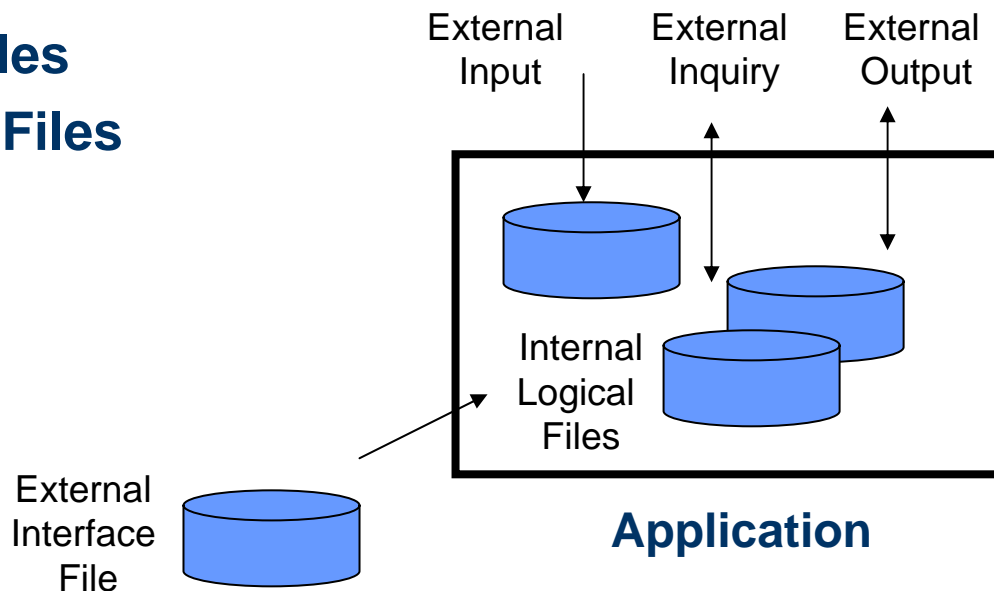
Characteristics of an Effective Sizing Metric

- 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 | ___ |
| Total Unadjusted FPs | | | | ___ |

Data Relationships {
 Record Element Types or File Types Referenced

Data Elements (# of unique data fields)

| | | |
|---------|---------|---------|
| Low | Low | Average |
| Low | Average | High |
| Average | High | High |

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

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

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 | ___ |
| Total Unadjusted FPs | | | | ___ |

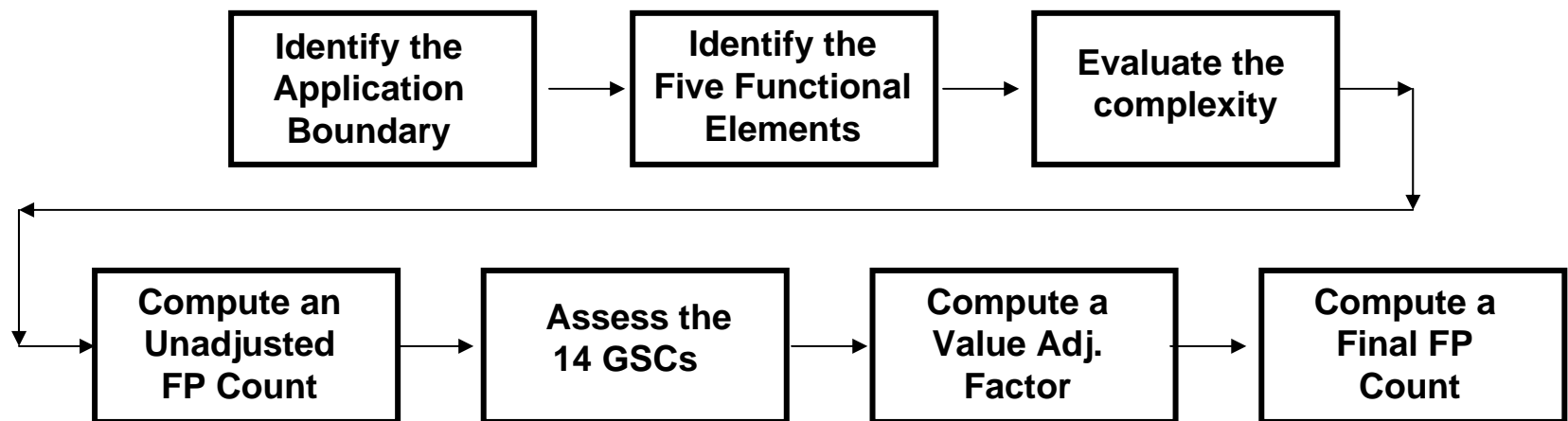
FP Lite™ Impact Analysis

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



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™ Statistics Group 1

Assumption: Statistics based on Adjusted function points.

All Projects

| | |
|--------------|----------|
| Detail Count | 5954 FPs |
| FP Lite™ | 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™ 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

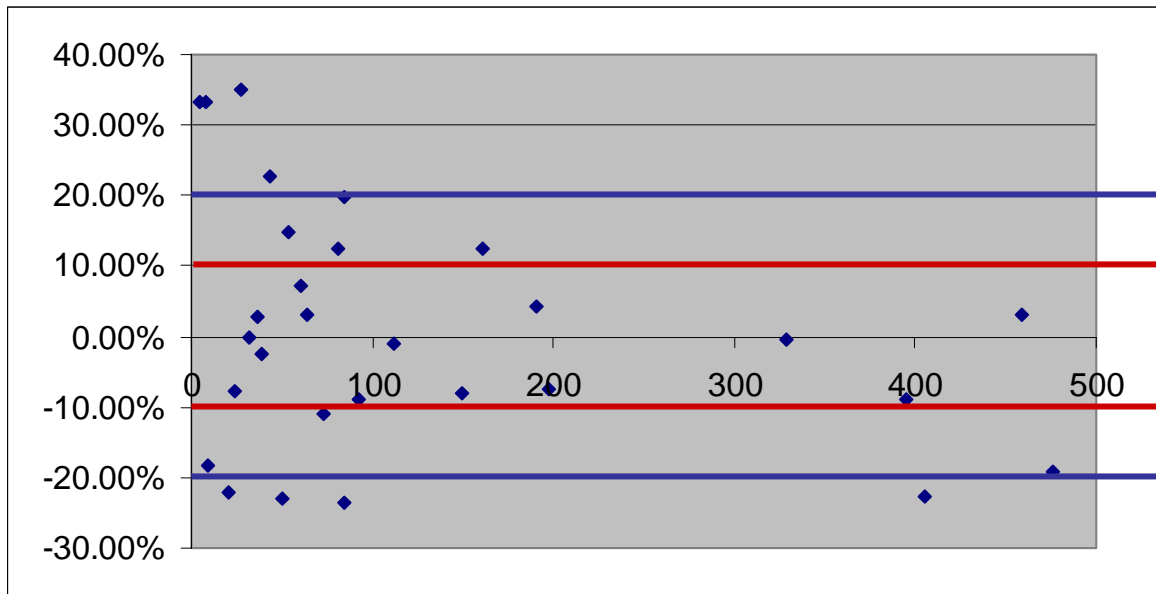
| | |
|--------------|-------|
| Detail Count | 19733 |
| FP Lite™ | 17738 |

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



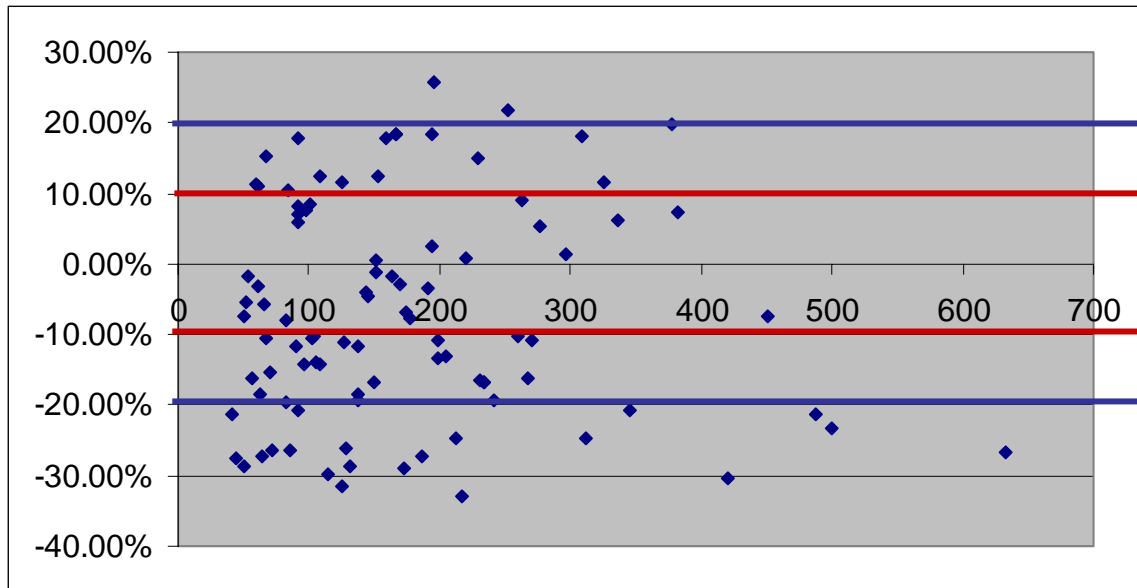
Group 1

47% were less than +/- 10%

74% were less than +/- 20%

26% were greater than +/- 20%

Group 2 – Range Analysis



Group 2

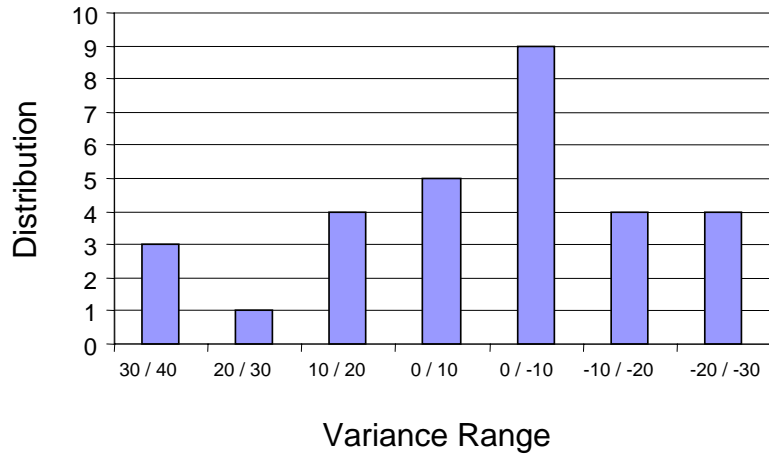
30% were less than +/- 10%

75% were less than +/- 20%

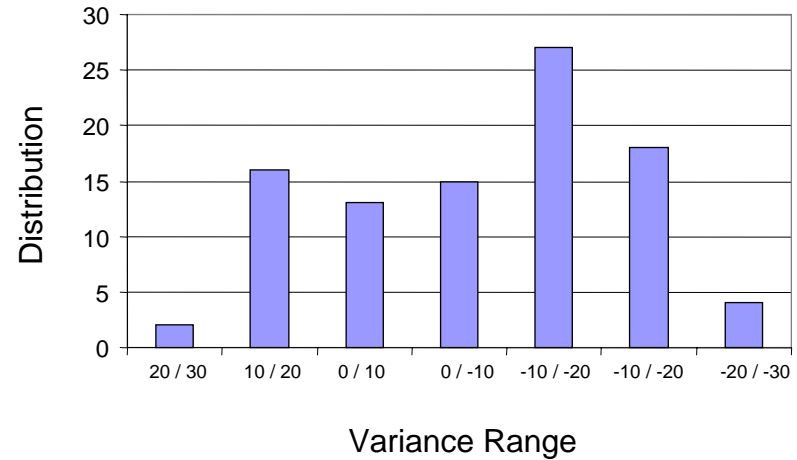
25% were greater than +/- 20%

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_{TM} 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_{TM} estimates were within +/- 20% of actual. Conversely, 30% of the time FP Lite_{TM} sizings were no greater than +/- 40%
- GSCs were not statistically significant relative to the results of the final count
- Using the FP Lite_{TM} approach may be more productive

Why Sizing is Important

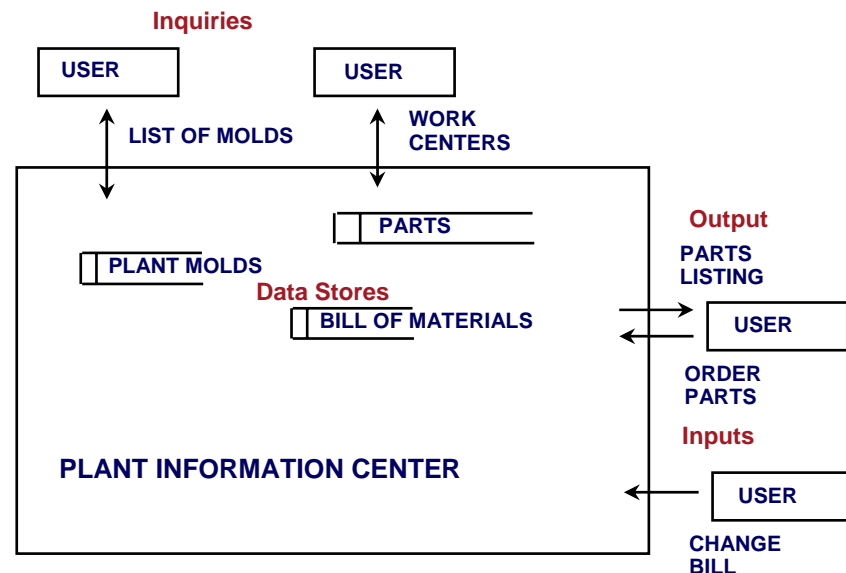
- Requirements – An ability to evaluate the size of the requirements based upon functionality being requested
- Estimation – Size is a key variable required to effectively estimate the level of effort
- Process Improvement – Requires a consistent sizing measure to be used as the basis for comparing levels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



Requirements Gathering

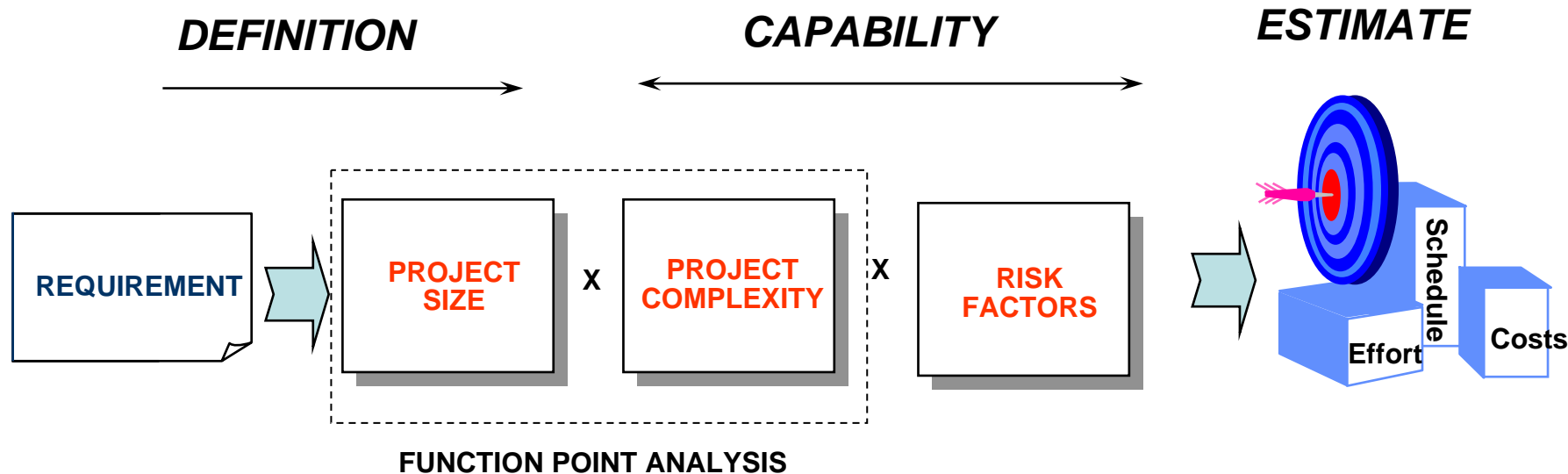
The FP Lite™ method of sizing can be used early in the lifecycle to generate a preliminary size useful in managing the scope of the project.

| Element | Value |
|-------------------|-----------|
| Inquires (2) | 8 |
| Inputs (1) | 4 |
| Outputs (1) | 5 |
| Data Stores (3) | 30 |
| Total Size | 47 |



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!!