



Q/P MANAGEMENT
GROUP, INC.

Leveraging Function Point Analysis to Reduce Project Risk

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Notes



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Leveraging Function Point Analysis to Reduce Project Risk

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Notes

Agenda



- Function Point Introduction
- Clarity of Requirements
- Project Planning & Tracking
- Utilizing Industry and Internal Benchmarks
- Summary

Notes

Function Points

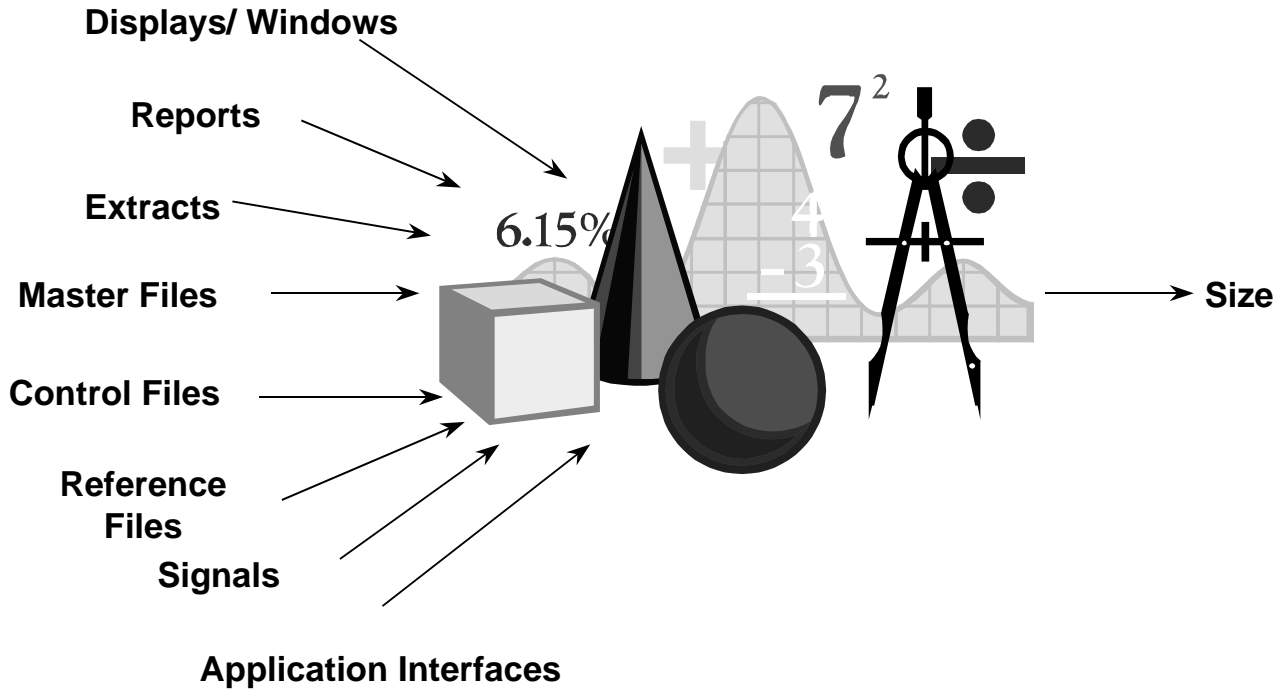
Quantifies software functionality recognizable to a knowledgeable user

Based on an accepted industry standard (IFPUG 4.x) with repeatable processes and results

Independent of development tools and technology

Notes

Function Points Consider



Notes

Definition of Function Points

Functional Components

Examples

Data Functions

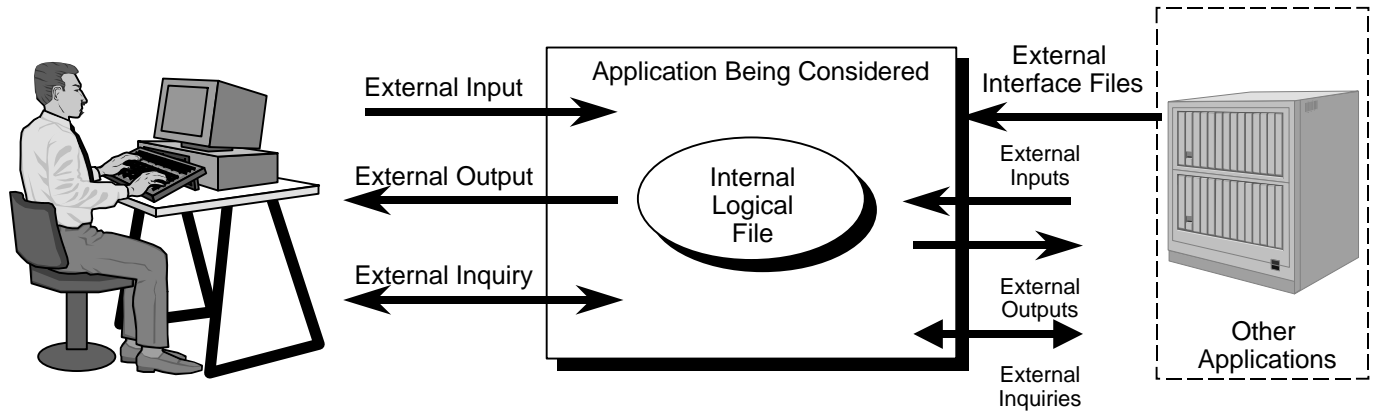
- | | |
|----------------------------|-----------------------|
| - Internal Logical Files | • Application Files |
| | • Internal Registers |
| - External Interface Files | • Reference Files |
| | • External Data Bases |

Transactional Functions

- | | |
|--------------------|------------------------------|
| - External Inputs | • Input Transactions |
| | • Sensor Signals |
| - External Outputs | • Output Reports |
| | • Displays with Derived Data |
| - External Inquiry | • Online Inquiry |
| | • Retrieved Data |

Notes

Definition of Function Points (Continued)



Functionality as viewed from the user's perspective

Notes

Value Adjustment Factor - Addresses the Technical and Operational Characteristics of the Application

14 **General System Characteristics** adjust the Function Point count -
Each characteristic is scored on a 0-5 Degree of Influence scale

- | | |
|-------------------------------|-----------------------|
| 1.Data communications | 8. On-line update |
| 2.Distributed data processing | 9. Complex processing |
| 3.Performance | 10. Reusability |
| 4.Heavily used configuration | 11. Installation ease |
| 5.Transaction rate | 12. Operational ease |
| 6.On-line data entry | 13. Multiple sites |
| 7.End-user efficiency | 14. Facilitate change |

The Value Adjustment Factor is calculated once for each application

Notes

Now you have Function Points

So What !



Notes

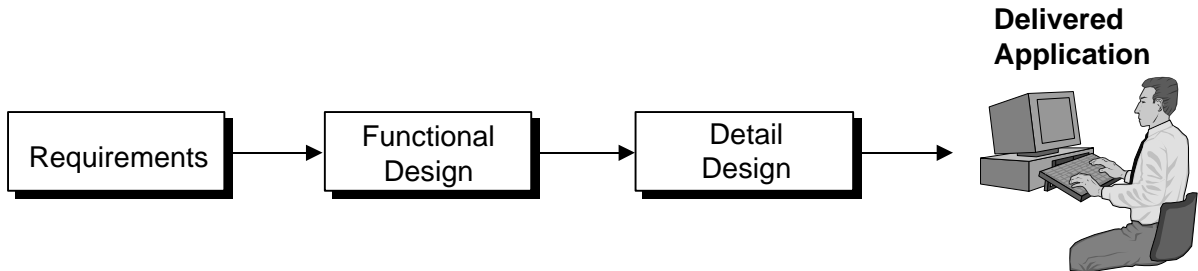
Project Delivery Expectation



Function Points are one aspect of a project

Notes

Management of Scope Using Function Point Analysis



	100 FPs	120 FPs	130 FPs	135 FPs
		<ul style="list-style-type: none"> State Code input screen changed (3 FPs) Interface to N&A file added (10 FPs) N&A inquiry and state code inquiry added (7 FPs) 	<ul style="list-style-type: none"> New regulatory table added (10 FPs) 	<ul style="list-style-type: none"> Summary report added (5 FPs)
Impact				
Effort		+ 1 month	+ .5 month	+ .25 month
Schedule		+ 2 weeks	+ 1 week	+ 2.5 days
Cost		+ \$5 K	+ \$2.5 K	+ \$1.25 K

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Requirements are Key

Clear, unambiguous requirements is a key influencing factor

If you:

design it once
build it once
test it once
install it once

Its better than doing those activities twice for the same function

Notes

Define and Clarify Requirements

- Function Point Analysis primary intent originally was to improve communication and clarify functional requirements
- Function Point Analysis is an excellent facilitation technique to gather high level requirements
- The clarity of requirements has a direct impact on project performance

Notes

Clarity of Requirements Risk Assessment Definitions -Sample

IMP Importance of Function

- Critical
- Important
- Desired
- Nice to Have

Risk Categories

Score

D	Documented	1-2	Higher score
C	Clarity of Function	1-3	reflects
CM	Complexity of Function	1-3	high risk
S	Susceptibility of change to the Function	1-4	

Notes

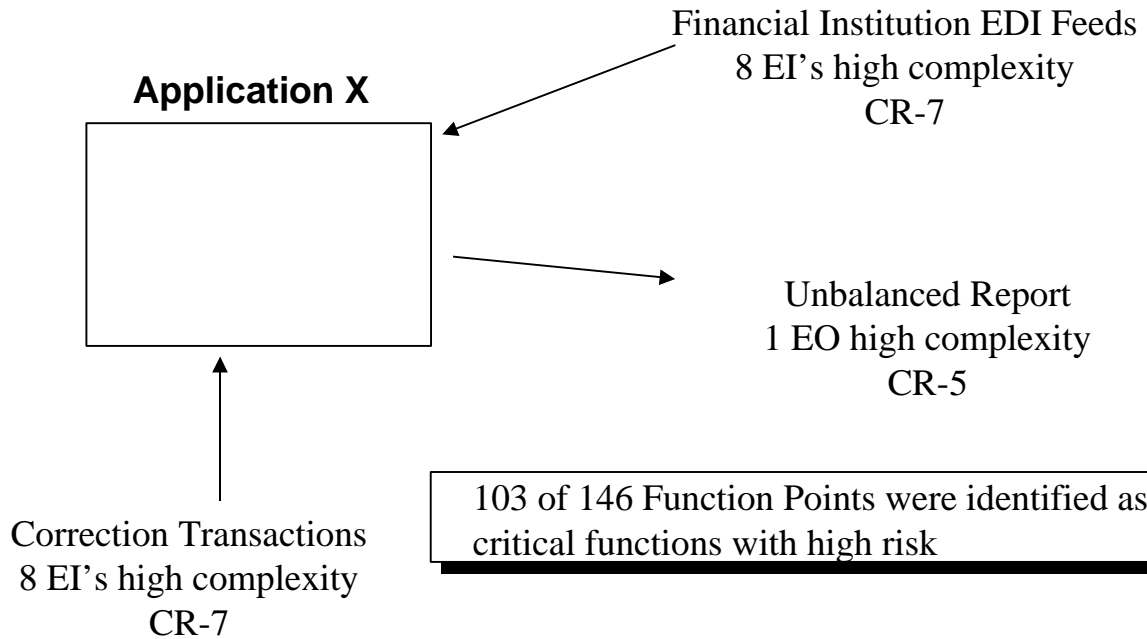
Example Clarity of Requirements Function Point Spreadsheet

<u>Function ID</u>	<u>Importance</u>	<u>Doc</u>	<u>Clar</u>	<u>Com</u>	<u>Sus</u>	<u>Risk Total</u>	<u>Description</u>	<u>FP Type</u>	<u>RETs/ FTRs</u>	<u>DETs</u>	<u>FP</u>
Req1	Desired	1	1	1	1	1	State Code -add	EI	1	4	3
Req1	Desired	1	2	1	1	2	State Code -update	EI	1	4	3
Req1	Desired	1	3	2	2	12	State Code -delete	EI	4	3	3
Req1	Desired	2	3	1	1	6	State Code -View	EQ	1	4	3
Req1	Desired	1	1	1	1	1	State Code	ILF	1	2	7
Req1	Nice to Have	2	3	3	3	54	State Code Report	EO	1	5	4
Req2	Critical	1	2	2	3	12	Employee -add	EI	3	16	6
Req2	Critical	1	2	2	3	12	Employee -change	EI	3	16	6
Req2	Important	1	2	3	3	18	Employee -suspend	EI	1	3	3
Req2	Important	1	2	3	3	18	Employee -reinstate	EI	1	3	3
Req2	Critical	1	2	2	3	12	Employee -view	EQ	2	18	4
Req3	Important	1	1	1	1	1	Employee -List	EO	1	4	4
Re4	Critical	1	2	1	2	4	Employee Data Store	ILF	1	20	7
Req5	Critical	2	3	3	3	54	Benefits Report	EO	4	20	7

Classifying importance and quantification of associated risks for each function helps recognize and prioritize specific areas requiring clarification


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Actual Risk Assessment Example Summary of High Risk Functions for Release 2



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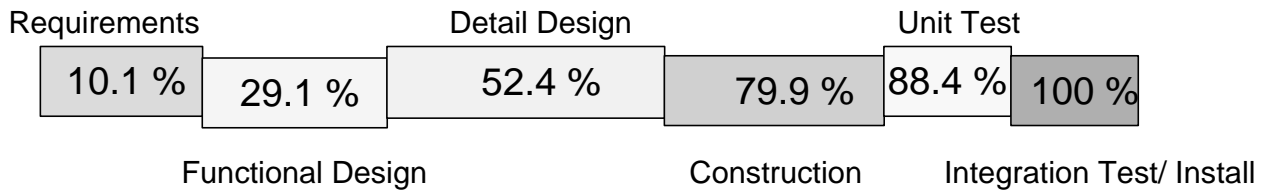
Project Tracking

- Various ways can be applied to measure and track project progress
- This is highly dependent upon the lifecycle you are using
- Iterative and spiral methodologies will also need to anticipate rework or changes due to the release strategy selected

Notes

Project Tracking

Percent complete if completed a given phase of the SDLC



For Iterative and Spiral Lifecycles

- May evaluate as multiple projects
- There is likely some rework involved and can be discussed, planned and tracked

It is critical to monitor the scope and progress ongoing throughout the development/ enhancement project at selected key milestones

The percentages documented are for demonstration purposes only and are not industry average

Notes

Example of Project Tracking

ACME Road Runner Catching Project

Project Plan May 1, 2001

3,500 FP Estimated

<u>Phase</u>	<u>Hours Estimated</u>	<u>Percentage Calculated</u>
Requirements	9,500	10.1%
Functional Design	18,000	29.1%
Detail Design	22,000	52.4%
Construction/ Build	26,000	79.9%
Unit Test	8,000	88.4%
Integration Test	11,000	100.0%
Total Hours Estimated	94,500	

Use existing project plan and effort estimates when available to generate phase percentages

Notes

Update the Count and Collect Hour Information

Count September 25, 2001		
3,900 FP Counted		
	<u>Hours</u>	<u>Hours Consumed</u>
<u>Phase</u>	<u>Estimated</u>	<u>To-date</u>
Requirements	9,500	8,000
Functional Design	18,000	16,000
Detail Design	22,000	13,000
Construction/ Build	26,000	9,000
Unit Test	8,000	1,000
Integration Test	11,000	-
Total Hours	94,500	47,000
Expected Complete (based on hour consumption)	50%	

“I have spent half the budget so I must be halfway there”

Notes

Determine Actual Project Productivity To-date

FP Credit Complete/ Productivity	
FP Total Size	3,900
FP Credit Complete	1,200
Credit Complete %	31%
Hours Consumed To-date	47,000
FP Current Forecasted Productivity Rate	0.026

Functionality credited complete is significantly less than 50 %, additional analysis is required, current productivity can be estimated

Notes

Revised Effort Estimates

Estimated Hours Remaining	
Estimated Function Points	3,900
Credit Complete	1,200
Function Points Remaining	2,700
Historical Project Productivity Rate To-date	0.026
Estimated Hours Remaining	103,846
Total Project Hours Estimated	150,846
Additional Hours Required from Estimated at Requirements	56,346

After further analysis, budgets and commitments may require renegotiations

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Benchmark Measures and Metrics

Critical Performance Comparisons	Measures	Metrics and Examples
Productivity	Effort and Output	Output per Unit of Labor = FP/Hour
Quality	Defects and Output	Problems per Unit of Output = Defects/FP
Financial	Cost and Output	Cost per Unit of Output = \$/FP
Practices	Project and Environmental Characteristics	Company Practices versus Average and Best Practices = Attribute Analysis or CMM Profile

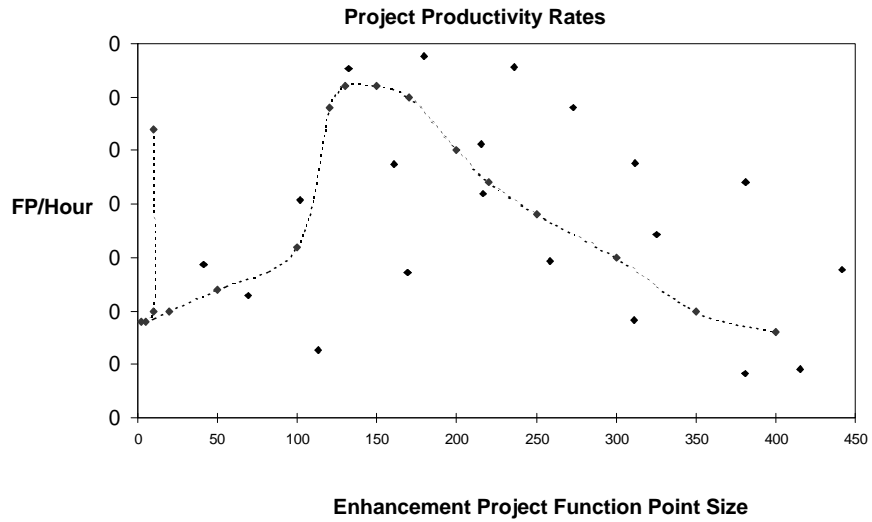
Notes

Project Attributes Impact

Project Attributes	% Impact on Project Effort and Schedule
Personnel Management	+/- 100%
Process and Methods	+/- 75%
Technology and Tools	+/- 50%
Environment and Support	+/- 25%

Notes

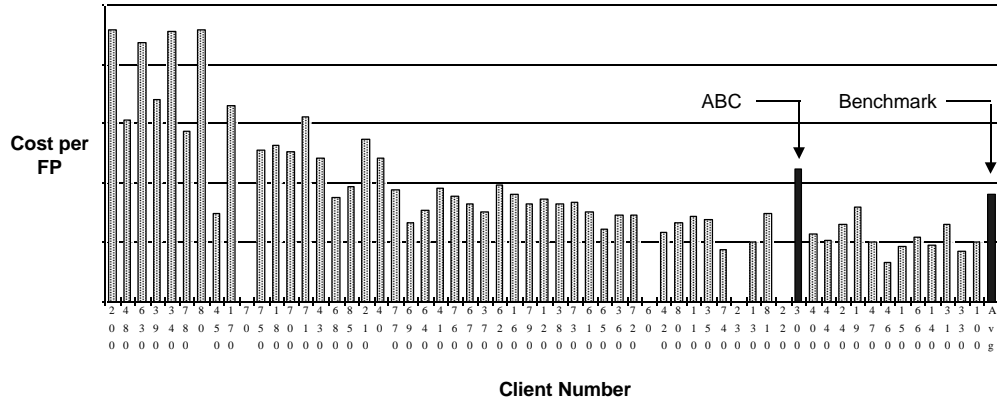
Historical Metrics are Required for Future Estimating



Every organization has an optimum size/productivity range

Notes

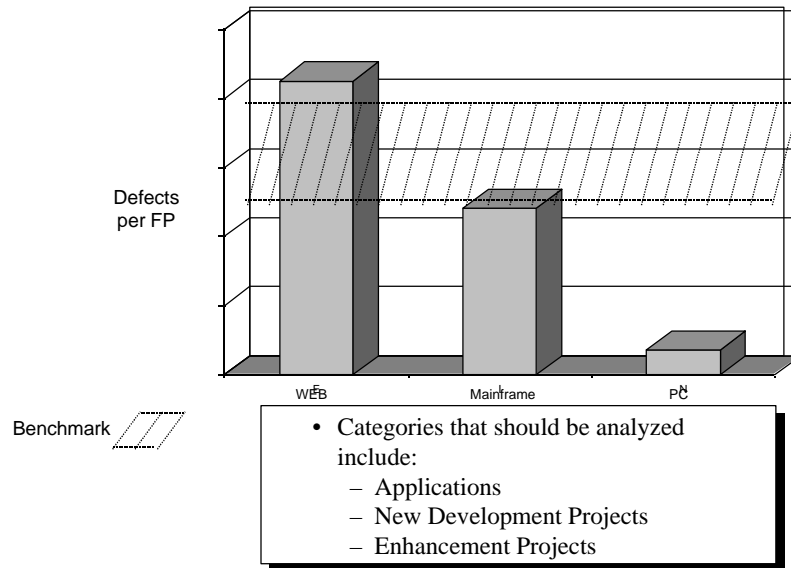
Cost (\$) * / Project Function Point



Cost per FP is higher than the benchmark average due to higher than average salary and benefits

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Defects by Development Category



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Usage of Function Points to Further Reduce Project Risk

- Functionality now itemized in a spreadsheet
- Use for Risk Assessment purposes
- Identify criticality of functional components
- Identify re-use opportunities & strategy
- Estimate project effort/ schedule
- Estimate rework and stability
- Use to improve communication of requirements
- Estimate quality (defect density) “Good Enough?”
- Help determine methodology selection
- Help develop effective/ efficient release strategies
- Estimate support & enhancement effort required

Information collected must be used and viewed as helpful and beneficial at organizational, team and individual levels.

Notes

Summary

- Identify requirements requiring additional clarification
- Generates early discussion on scope and definitions
 - Hours (include unpaid overtime ?)
 - Cost (includes travel ?)
 - Cost (includes hardware/ development tools ?)
 - etc
- Function Point Analysis techniques helps reduce project risk

Notes

Summary (continued)

- Checklist approach of Function Point Analysis helps ensure key activities are included such as conversion
- Different goals for the measurement activity may require various additional measures to be collected to supplement the Function Points
- Function Points are not an all inclusive measure, but the techniques, processes and measures itself are extremely valuable to the project
- Provides valuable information to executives, management, plus project team members to reduce project risk in several areas

Notes