



Q/P MANAGEMENT
GROUP, INC.

Evaluating COTS Using Function Fit Analysis

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Notes:

Agenda

- Introduction
 - Purpose
 - Overview of Process
 - Definition of Function Points
 - Benefits
- The Function Fit Analysis Process
 - Steps
 - Examples
- Summary
 - Examples
 - Conclusion

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Notes:

Purpose

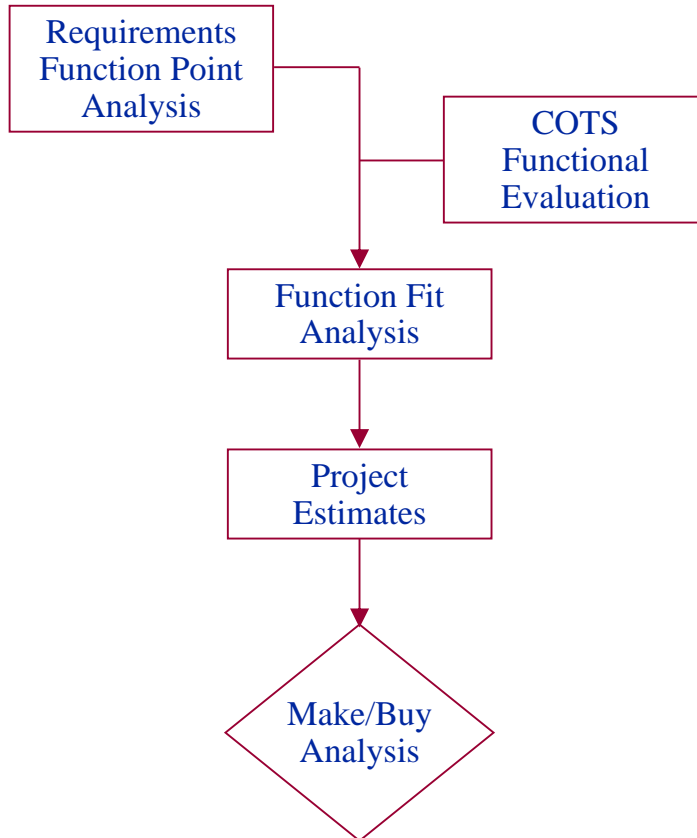
**To present a process to aid in analyzing
Commercial Off-The-Shelf (COTS) solutions
as a development alternative**

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Notes:

Function Fit Analysis Process Overview



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Notes:

FPA Helps Define Requirements & Evaluate COTS

Definition of Function Points

- Unit of Measure
- Represents the outcome of the software development life cycle
- Functionality is from the User Perspective

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Notes:

Definition of Function Points

Count consists of:

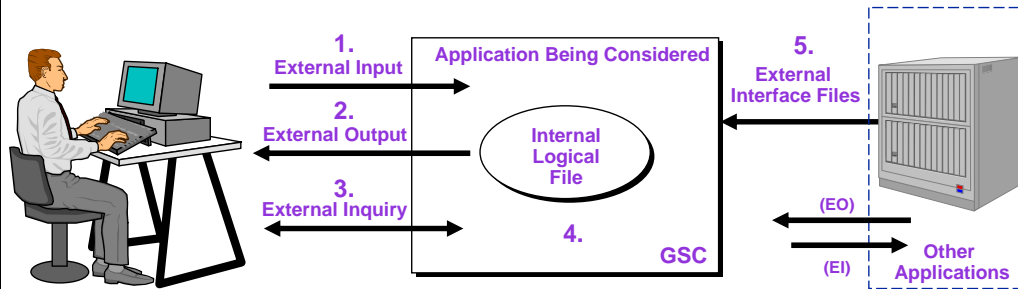
- Functional Components
 - Internal Logical Files
 - External Interface Files
 - External Inputs
 - External Outputs
 - External Inquiries
- Functional Complexity
- Value Adjustment Factor (General System Characteristics)

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Definition of Function Points (Continued)



- FPA is comprised of 5 functional components and 2 adjustment factors for data complexity and operational complexity
- FPA considers the functionality of the application and its interaction with other applications

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Notes:

Benefits of Function Fit Analysis

- Documents functional requirements in terms understandable to users and technicians
- Identifies the functional fit/gap of the COTS products
- Quantifies development effort of COTS usage
- Provides information to the COTS vs. Development decision making process

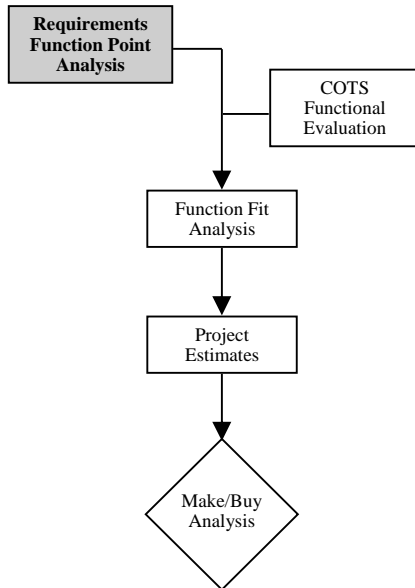
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Notes:

Function Fit Analysis Process

Step 1: Requirements Function Point Analysis



- Complete a function point count based on the existing requirements document or system to be replaced
- Use perspective of developing from scratch
- Include all functions necessary to meet the users needs

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Notes:

Function Fit Analysis Process

Step 1: Requirements Function Point Analysis (Continued)

Example

Count Detail

Project Name:	Project Name	
Prepared by:	Your Name	
Date:	Todays Date	

Add Chg Del Conv Unch	Date/ Phase Introduced	Functional Component	Function ID or Doc Reference	DESCRIPTION	FUNC TYPE	Trans Type	FTR	DET	RET	L/A/H	"x"
				Personal Data	ILF			113	7		1
				Dependent Data	ILF			127	2		1
				Member Address - u (update)	EI		3	21			1
				Member Address - v,p (view,print)	EQ	out	3	19			2
				Activity Gain - a,u (add,update)	EI		>2	24			2
				Activity Gain - v,p	EQ	out	>3	22			2
				SECURITY							1
				Users	ILF			9	2		1
				User - a,c,d	EI		2	11			3
				User Inquiry	EQ	out	1	9			1
				Reports							1
				Military Pay Order Report (online,print,file)	EO		<4	<20			3
				Mobilization Gaining Command Alpha Listing (online,print,file)	EO		<4	<20			3
											1
											1
x	x	x	x	x	x	x	x	x	x	x	x

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Notes:

Function Fit Analysis Process

Step 1: Requirements Function Point Analysis (Continued)

Example

New Development Summary

Project Name:	Project Name
Prepared by:	Your Name
Date:	Todays Date
SUMMARY:	New Development/Total Deliverable

GENERAL SYSTEM CHARACTERISTICS

	WEIGHT
01. Data Communications	5
02. Distributed Data Processing	4
03. Performance	4
04. Heavily Used Configuration	5
05. Transaction Rate	5
06. On-line Data Entry	5
07. End-User Efficiency	4
08. On-line Update	5
09. Complex Processing	3
10. Reusability	3
11. Installation Ease	5
12. Operational Ease	3
13. Multiple Sites	5
14. Facilitate Change	5

Total Degrees of Influence (TDI): 61

UNADJUSTED FUNCTION POINT COUNT (UFP)

	LOW		AVG		HIGH		TOTAL
	#	WT	#	WT	#	WT	
Internal Logical File	1	7	0	10	2	15	37
External Interface File	0	5	0	7	0	10	0
External Input	0	3	3	4	3	6	30
External Output	0	4	6	5	0	7	30
External Inquiry	1	3	2	4	2	6	23

UFP = 120

ADJUSTED FUNCTION POINT COUNT

TDI	(TDI*.01)+.65	VAF	VAF x UFP =	AFP
61		1	1.26 x 120	151

AFP = 151

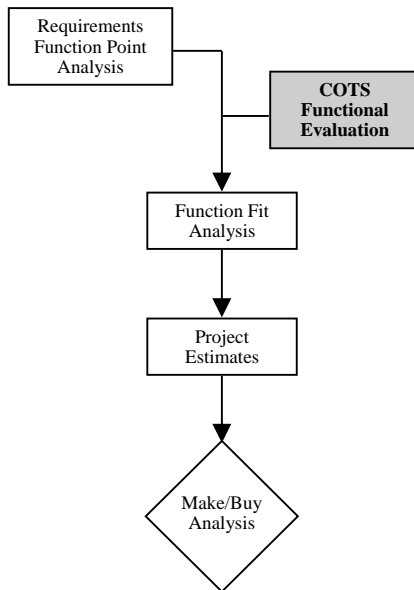
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Notes:

Function Fit Analysis Process

Step 2: COTS Functional Evaluation



- Review COTS product utilizing the function point count from Step 1
- Identify functions that:
 - A. Exist in the COTS with no change required
 - B. Exist in the COTS but require modification
 - C. Need to be added to the COTS product
 - D. Need to be removed from the COTS product
- Create a function point count for COTS alternative(s)

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Notes:

Function Fit Analysis Process

Step 2: COTS Functional Evaluation (Continued)

Example

Count Detail

Project Name: Project Name			
Prepared by:	Your Name		
Date:	Todays Date		

Add Chg	DeI Conv	Date/ Phase	Functional	Function	FUNC	Trans	FTR	DET	RET	L/ A/H	"x"
Unch	Introduced	Component	ID or Doc	DESCRIPTION	TYPE	Type					
Add				Personal Data	ILF			113	7		1
Chg				Dependent Data	ILF			127	2		1
											1
Chg				Member Address - u (update)	EI		3	21			1
Chg				Member Address - v,p (view,print)	EQ	out	3	19			2
											1
Add				Activity Gain - a,u (add,update)	EI		>2	24			2
Add				Activity Gain - v,p	EQ	out	>3	22			2
											1
				SECURITY							1
unch				Users	ILF			9	2		1
unch				User - a,c,d	EI		2	11			3
unch				User Inquiry	EQ	out	1	9			1
											1
				Reports							1
Chg				Military Pay Order Report (online,print,file)	EO		<4	<20			3
Add				Mobilization Gaining Command Alpha Listing (online,print,file)	EO		<4	<20			3
											1
x		x		x	x		x	x	x	x	x

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Notes:

Function Fit Analysis Process

Step 2: COTS Functional Evaluation (Continued)

Example

Enhancement Project Summary

	LOW		AVG		HIGH		TOTAL
	#	WT	#	WT	#	WT	
ADDS							
Internal Logical File	0	7	0	10	1	15	15
External Interface File	0	5	0	7	0	10	0
External Input	0	3	0	4	2	6	12
External Output	0	4	3	5	0	7	15
External Inquiry	0	3	0	4	2	6	12

UFP = 54

	LOW		AVG		HIGH		TOTAL
	#	WT	#	WT	#	WT	
CHANGES							
Internal Logical File	0	7	0	10	1	15	15
External Interface File	0	5	0	7	0	10	0
External Input	0	3	0	4	1	6	6
External Output	0	4	3	5	0	7	15
External Inquiry	0	3	2	4	0	6	8

UFP = 44

	LOW		AVG		HIGH		TOTAL
	#	WT	#	WT	#	WT	
DELETES							
Internal Logical File	0	7	0	10	0	15	0
External Interface File	0	5	0	7	0	10	0
External Input	0	3	0	4	0	6	0
External Output	0	4	0	5	0	7	0
External Inquiry	0	3	0	4	0	6	0

UFP = 0

	LOW		AVG		HIGH		TOTAL
	#	WT	#	WT	#	WT	
CONVERSION							
Internal Logical File	0	7	0	10	0	15	0
External Interface File	0	5	0	7	0	10	0
External Input	0	3	0	4	0	6	0
External Output	0	4	0	5	0	7	0
External Inquiry	0	3	0	4	0	6	0

UFP = 0

	LOW		AVG		HIGH		TOTAL
	#	WT	#	WT	#	WT	
UNCHANGED							
Internal Logical File	1	7	0	10	0	15	7
External Interface File	0	5	0	7	0	10	0
External Input	0	3	3	4	0	6	12
External Output	0	4	0	5	0	7	0
External Inquiry	1	3	0	4	0	6	3

UFP = 22

Adds, Changes, & Conversion

TDI	(TDF*.01)+.65	New VAF	New VAF x	UFP =	AFP
61		1.26	1.26 x	98	123

Deletes

TDI	(TDF*.01)+.65	Old VAF	Old VAF x	UFP =	AFP
61		1.26	1.26 x	0	0

TOTAL PROJECT:

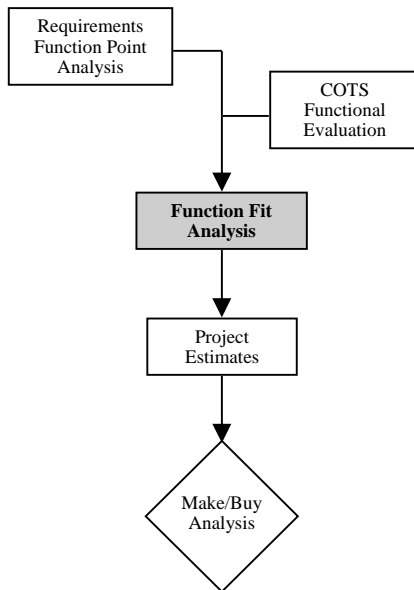
Add, Chg, Conv AFP	+ Deleted AFP =	TOTAL AFP
123	0	123

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Notes:

Function Fit Analysis Process

Step 3: Function GAP Analysis



- Define what “FIT” means
- Determine percentage of out-of-the-box functionality
- Determine percentage of enhancement requirements (i.e. adds, changes, deletes)

Notes:

Function Fit Analysis Process

Step 3: Function GAP Analysis (Continued)

Example

The following table details the Added, Changed, and Unchanged Function Points by release and Application.

Added, Changed, and Unchanged COTS - by Increment

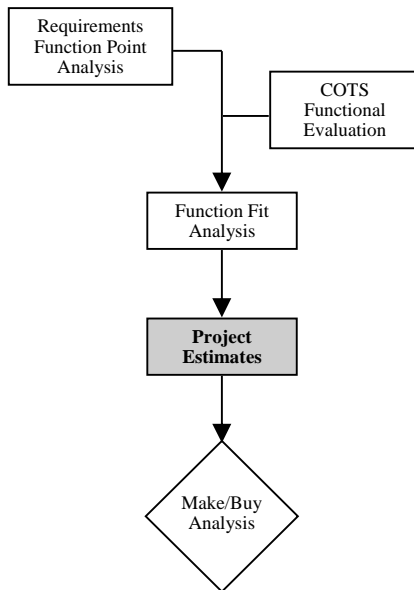
Increment 1	Added	Changed	Unchanged	Total AFP
Field	9,444	200	258	9,902
Corporate	2,862	418	167	3,447
Total	12,306	618	425	13,349
Increment 2-4	Added	Changed	Unchanged	Total AFP
Field	6,887	18	9	6,914
Corporate	1,182	0	0	1,182
Total	8,069	18	9	8,096
Total Project	Added	Changed	Unchanged	Total AFP
Field	16,331	218	267	16,816
Corporate	4,044	418	167	4,629
Total	20,375	636	434	21,445
Percent of Total Project	95%	3%	2%	100%

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Function Fit Analysis Process

Step 4: Project Estimates



- Estimate Effort, Staff, and Schedule for the “develop from scratch” alternative
- Estimate Effort, Staff, and Schedule for the “COTS” alternative(s)

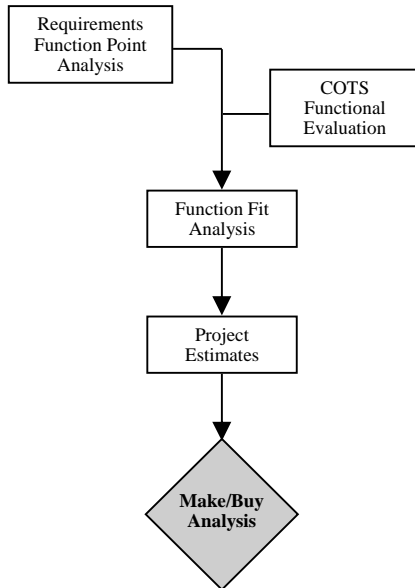
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Notes:

Function Fit Analysis Process

Step 5: Make/Buy Analysis



- **Buy as is if:**

- Prepared to live with it
- Willing to change business to adapt to application
- Schedule sensitivity is overriding factor
- Development and future maintenance funding is limited

- **Customize if:**

- Cost is more viable than building (development and ongoing support \$)
- Minor customization
- Relatively schedule-sensitive

- **Develop if:**

- Specific requirements are not available
- Initial Cost of COTS (with support \$) is higher than developing and supporting
- Ongoing Upgrade and support costs
- User questions and concerns

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Function Fit Analysis Process

Step 5: Make/Buy Analysis (Continued)

Considerations

- Evaluation costs
- ROI
- Purchase \$ (Initial purchase costs)
- Site License \$ (Costs per site)
- Annual Support \$ (How much and what does it include)
- Access to package specifics (Data model, Process model)
- Ownership of customized software
- Vendor to customize or can we do it ourselves
- Use the analysis information to discuss alternatives, proposed time frames, and budget constraints
- Existing database structure (Does it meet standards? Maintainability?)
- Existing architecture (Learning curve? Compatibility?)
- Language (Learning curve?)

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Notes:

Summary

Examples

- DoD Personnel Systems
 - Navy (2 COTS, both low fit -- chose to customize)
- Railroad
 - Tax system (minimal customization, ongoing enhancements)
- Steel Company
 - Order scheduling (no changes, built interfaces)

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Summary

Conclusion

- Function Fit Analysis provides a good framework to discuss and communicate functional requirements in objective terms
- Additional information is required to complement the function point data
- Function Fit Analysis is a valuable technique to help evaluate purchased/customized solutions

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