



Utilizing Functional Size on Enhancement Projects

Neslie Morrison, Dave Seaver

PSM Users' Group

Golden CO

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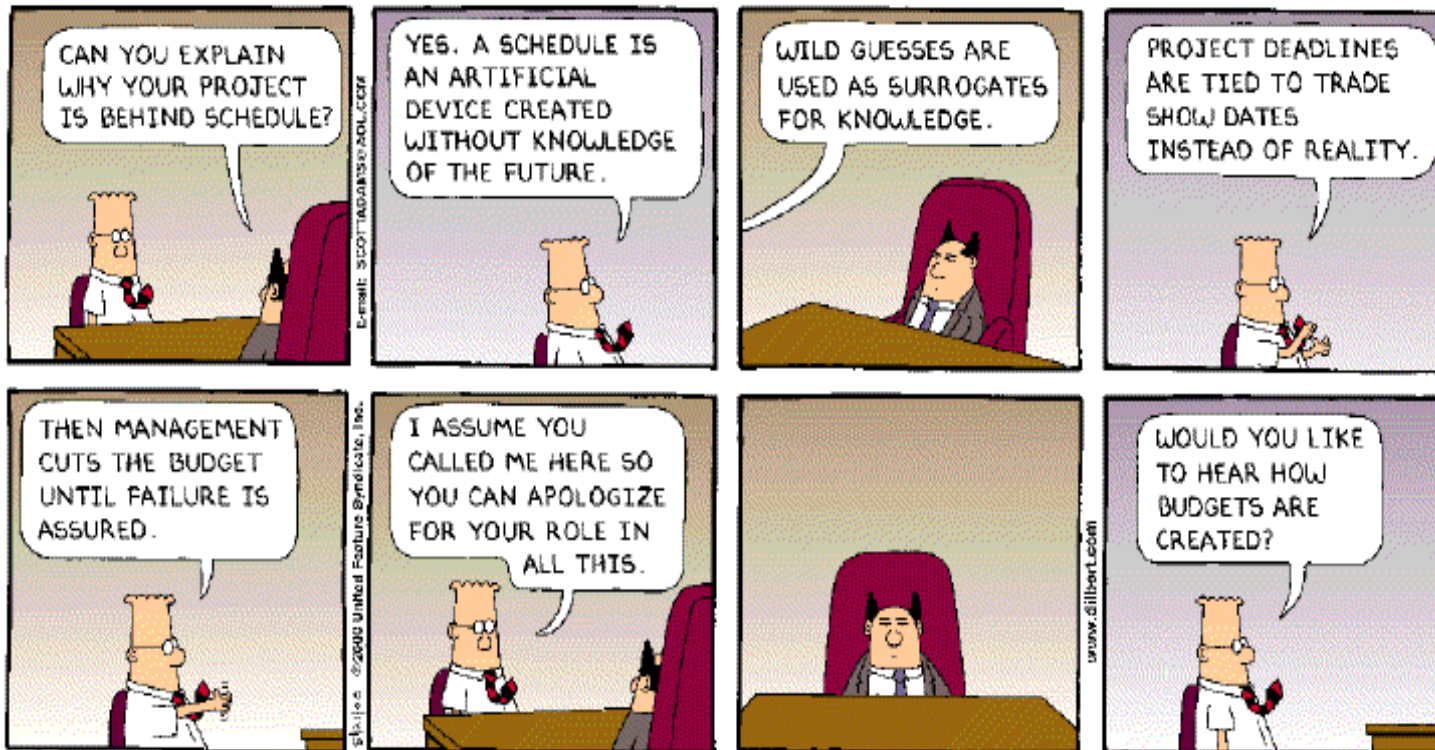
Overview

- Program Management Costing Dilemma
- Proposed Solution
- Function Points and Government Program Management
- Proposed Future Actions



Part 1

How cost estimation capability fits into Government Program Management



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Program Management Dilemma



Program Management Office needs a consistent methodology to:

- Communicate with software stakeholders
- Provide performance-based costing
- Evaluate proposals
- Establish spend plans
- Monitor cost, schedule, performance
- Mitigate risks



Independent Government Cost Estimates



- Your cost is based on your solution
- Where performance specifications are used, the IGCE is based on the Government's implicit approach to the work, which may differ from the offerors' approach
- Problem is how to generalize cost estimates



Independent Government Cost Estimations



- Plan and document incremental software requirements and design before task award to software developer
- Implement enhancements
- Develop, code, and test software fixes
- User satisfaction surveys – recommended enhancements
- Updates to user guides, on-line help, multimedia training packages
- Prepare and release software builds
- Operate help desk
- Perform systems / network administration on production, test, and demo environments



Cost Estimation Methods Used



Delphi method	User satisfaction surveys
Past Experience	<ul style="list-style-type: none">-Help desk functions-System administration
?	<ul style="list-style-type: none">-Updates to documents / on-line help / training-Software fixes, enhancements, and builds-Requirements / design



Part 2

Fast Function Points



IT Size



- **Function Points measure software size by quantifying the functionality based solely on logical design and functional specifications.**
- **Fast Function Points is a simplified size estimation technique that counts business transaction and data entities and converts these unit counts to function points**
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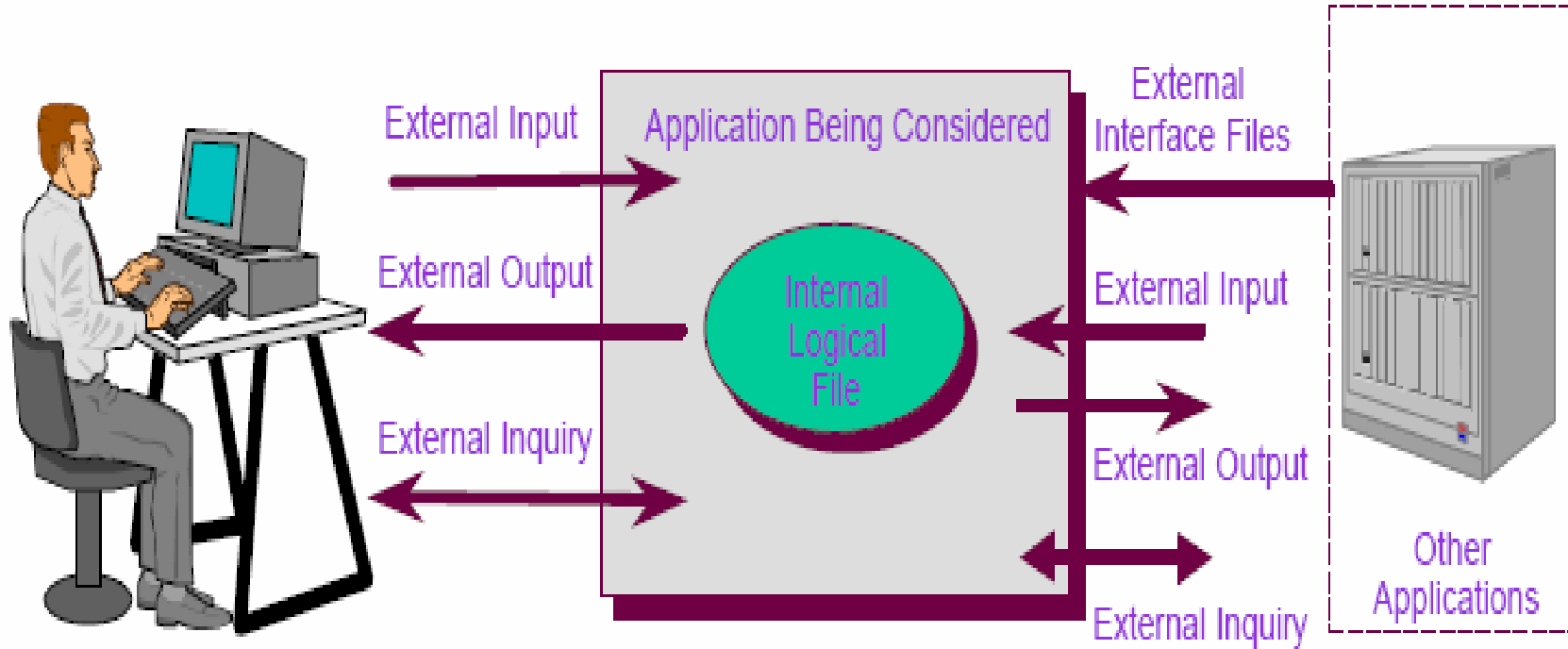


Steps in FP Counting

<i>IFPUG</i>	<i>FAST</i>
Determine Type of Count	Document Purpose of Estimate
Identify Counting Scope and Application Boundary	Identify Scope and Boundary
Count Data Functions	Count Transactions
Count Transactional Functions	Assign Data Functions to appropriate transactions
Determine Unadjusted Function Point Count	Determine Unadjusted Function Point Count
Determine Value Adjustment Factor	Determine Value Adjustment Factor
Calculate Adjusted Function Point Count	Calculate Adjusted Function Point Count



Fast Function Points





How much CRUD do you have?



Create / Add Data

Read / View Data

Report / Process Data

Update / Change / Edit Data

Delete Data

Data



Accelerate Function Point Counts

	<i>Low</i>	<i>Average</i>	<i>High</i>	<i>ISBGS</i>
inputs	3	4	6	4.3
outputs	4	5	7	5.4
queries	3	4	6	3.8
files	7	10	15	7.4
xfiles	5	7	10	5.5

- **Low, Average and High are the IFPUG values for Transactions and Data Functions**
- **Values in ISBGS column are the average values for the Transaction and Data Functions from the International Software Benchmarking Groups Database of projects**
- **Fast uses the ISBGS averages or rounds up the ISBGS averages to the next whole number**



How much CRUD do you have?



Each	ISBGS Average	ISBGS Rounded
<i>Create</i> →	4.3	→ 5
<i>Read</i> →	4.3	→ 5
<i>Report</i> →	5.4	→ 6
<i>Update</i> →	4.3	→ 5
<i>Delete</i> →	4.3	→ 5
<i>Data</i> →	7.4	→ 8



Fast Function Points



- This technique has been/is utilized at the
 - **IRS (3 estimates within 5% of actuals)**
 - **DoD ERP (3 projects within 5%)**
 - **The National Archives**
 - **Computer Science Corporation (\$650M ERP Win)**
 - **Accenture (\$700M ERP Win)**
 - **Fidelity Investments (65 projects average +/- 5%)**
 - **US Navy ERP**



Problems (real and alleged) with Function Points

- Takes a long time
 - experienced counter can count 800-1500 function points a day
- Boring
- Cannot perform accurate count until design is reasonably complete
- Inconsistency between different counts



Function Points

(My personal opinions)

- Core strength of the technique is the relationship it establishes between user transaction & data and software costs & schedules
- Very strong communication tool
- Proactively applied early in a project function points can accelerate the requirements and high level design process



Part 3

Function Points and Government Program Management



Functional Sizing – Point of Departure



Cost Estimations for:

DPS Phase II

- Updates to documents / on-line help / training
- Software fixes, enhancements, and builds

DPS Phase III

- Requirements / design



Software Size Estimate



Component #	Name	Summary	Function Points				
			inputs	outputs	inquiries	files ex files	
1	TSP Qualification	535	231		140	157	6
2	Customer Sat Survey	92	24		51	17	
3	Shipment Manager	845	289	12	362	182	
4	Best Value Scores	192	72	6	81	33	
5	Audits	467		12	455		
6	Claims	352	120		132	99	
7	Invoicing and Approving	67	29		38		
8	DPS Reporting	392		60	332		
9	Personal Property Consignment Two-Dimensional Military	116	19		64	33	
10	Shipping Label	39	10		21	8	
11	DPS Forms	9			9		
12	Counseling	388	87	6	213	83	
<i>System Administration Overhead</i>		874					
<i>Total</i>		4,370	766	91	1,592	489	6

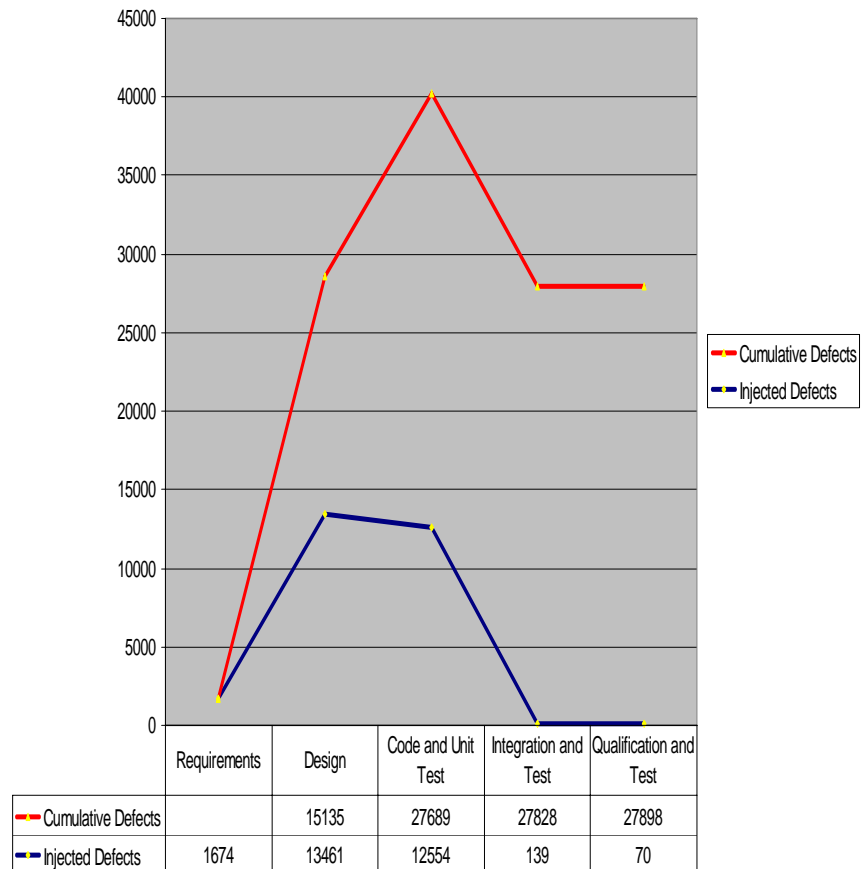
- DPS requirements were analyzed on a module basis. The software size estimate used the same approach
- Total size for Phase 2 is estimated to be 4,370 function points
- *DPS has many “pick lists” in the GUI which need to be maintained by systems admin. This typically includes additional interfaces outside normal end user requirements.*



True S

Rigorous methodology to take classic function point analysis and rapidly produce:

- Cost - labor hours and schedule) and
- Defect estimation





True S Modeling



Phase II - Added O&M
Phase for cost estimates
to fund

- Updates to documents /
on-line help / training
- Software fixes,
enhancements, and
builds

Notional Cost Estimation :Software Maintenance Releases	Total
Manage Project	\$70,000
Perform Configuration Management	\$30,000
Perform Joint Technical Reviews	\$5,000
Perform Quality Assurance	\$30,000
Plan and Oversee	\$2,000
Write Documentation	\$20,000
Perform Assembly, Integration, and Test	\$150,000
Total	\$307,000



Part 4

Way Ahead



Government Program Management

Use Function Points to:

- Communicate with software stakeholders
- Develop cost negotiation strategies
- Establish spend plans based on early, up-front estimations
- Monitor cost, schedule, performance
- Mitigate risks