

# Best Practices for IT Portfolio Budgeting



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# A Difficult Juggling Act in a Complex Environment

The Intelligence behind  
Successful Software Projects

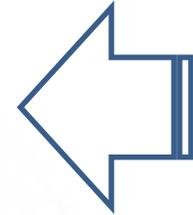
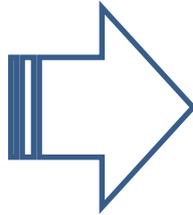
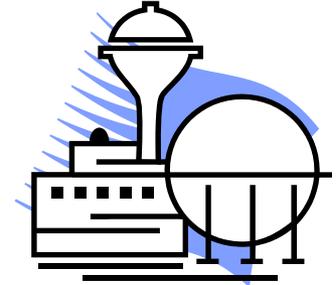
Business Demand



Technology & Business  
Executive Management



Production Capacity



## Budgeting Challenges

## Corporate Needs

- Short time fuse with lots of pressure
- Minimal information
- Results - commitments are locked in
- Political sensitivities
- No consistent estimation method

Risk Management

Resource Management

Pipeline Management

Financial Management

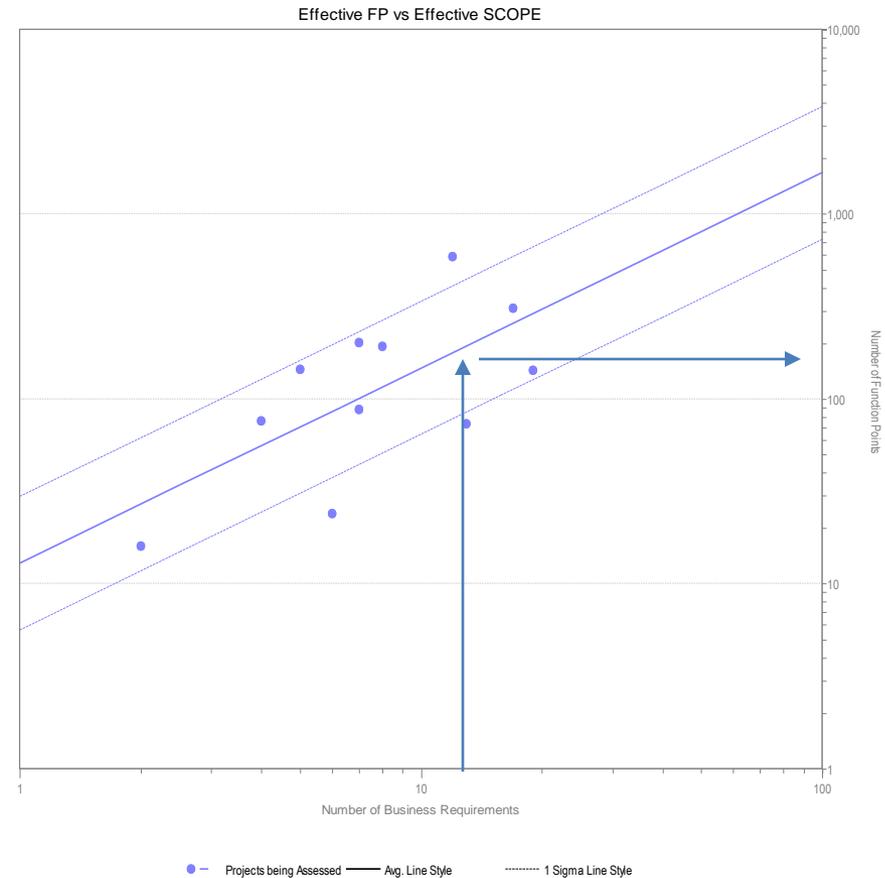
- QSM Best Practices Process
  - Step 1. Establish a tooling infrastructure that will support the existing business process
  - Step 2. Develop or Reverse Engineer “initial estimates”
  - Step 3. Identify “at risk” – “wasteful” projects
  - Step 4. Adjudicate outlier estimates
  - Step 5. Portfolio Assessment
    - As planned
    - Adjusted for risk and waste
    - Adjusted for resource capacity or financial constraints
  - Base Line Portfolio/Budget
  - Pass information corporate PPM

# Step 1 Infrastructure Setup



- Our goal is to make the estimation process as objective and fact based as possible in support of the portfolio budgeting process
- We do this by “dialing in” our tooling to the development environment
  - Methods/Platforms/Product Lines/Application Domains
- There are 3 main areas that we need to get a firm handle on
  - Scope (what you have to build to implement the capability)
  - Schedule & Effort Trend lines (what it has taken to produce a certain amount of scope)
  - Skill Resources Allocation (how our skilled labor is applied to a release)
- We collect basic project data from recently completed projects
  - Target 8 – 15 recently completed projects that are “representative”
  - Capture multiple sizing artifacts
  - Capture schedule and effort

- We determine and collect scope artifacts that are available at the time the budgeting is being done
  - Scope Statements
  - Business Requirements
  - Themes/Epics
  - Technical Requirements
  - Use Cases
- Function Points
- SLOC / Implementation Units



We establish the relationships between the scope metrics so any metric available can be used in the estimation process. Multiple metrics are used to “triangulate” the scope size

# Scope Sizing Estimator

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	Estimated # of Units	Calculated IU's	Calculated FP	Function Point Language Gearing Factor
Use Cases	214	12,496	201	60
Business Requirements	9	10,038	151	
Use Case Determined Function Points		12,067		
Business Requirements Determined Function Points		9,083		
Estimated Average IU's		10,921		
Estimated Low IU's		4,915		
Estimated High IU's		18,566		

Size Calculator

List of Sizing Estimates

Include	Name	Method	Expected Size	Linked Filename
Yes	Use Case Scope Sizing	Sizing by Decomposition	12594	
Yes	Requirements Based...	Sizing by Decomposition	10320	
Yes	Analogy Based Scop...	Sizing by History	9000	

Double-click any existing selection to edit. Click a column header to sort the estimates.

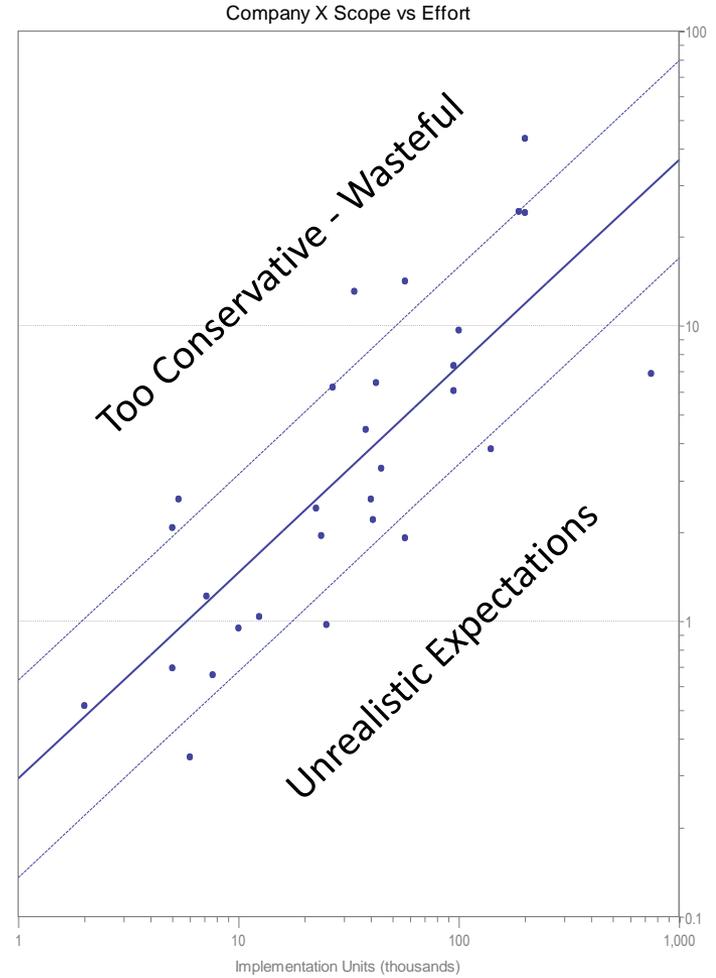
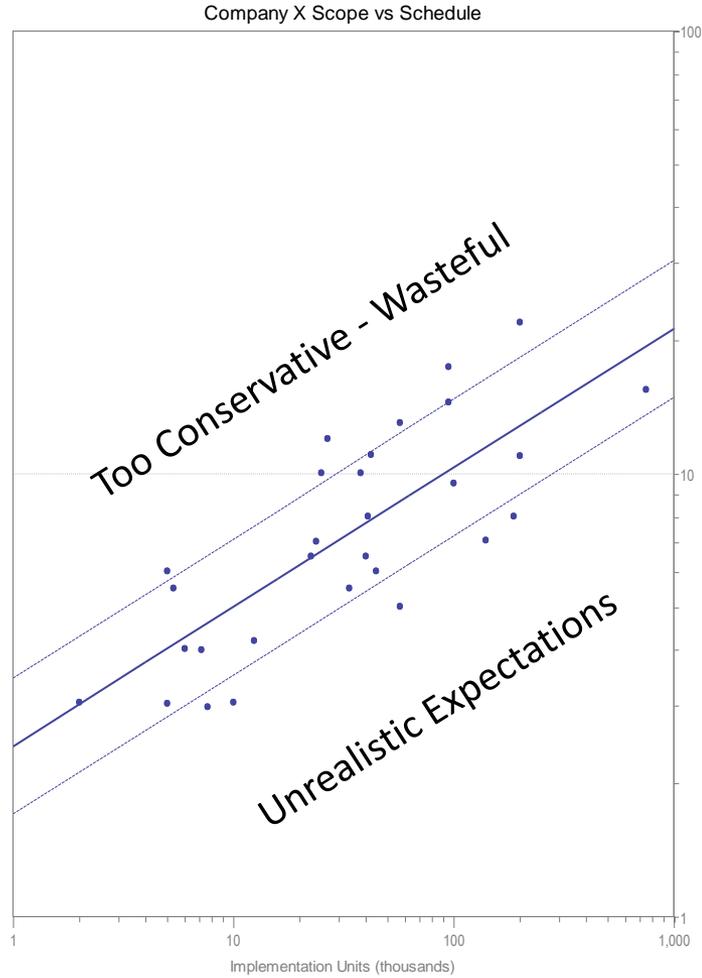
Summary of Combined Sizing Estimates

Average Individual Estimates
 Expected total IU: 10638

Very Large  
Large  
Medium  
Small  
Very Small

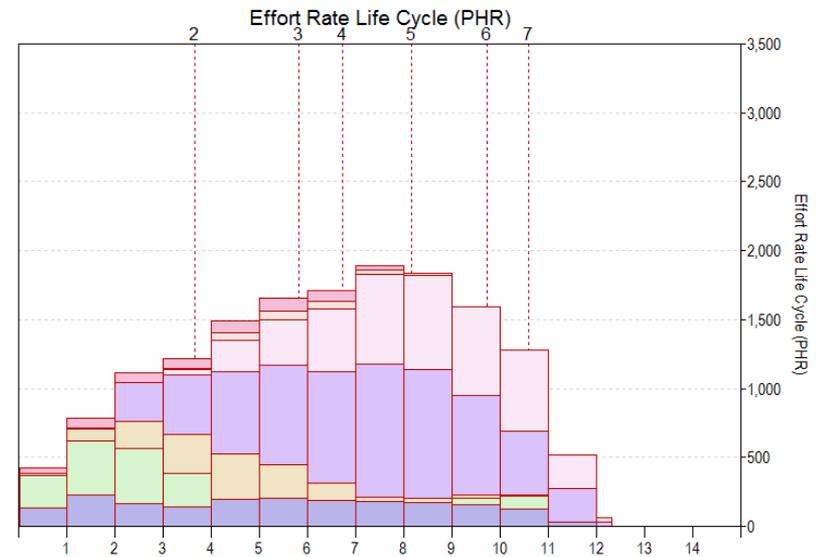
# Schedule & Effort Trend Lines – Performance Ground Truth

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• Business Systems — Avg. Line Style - - - - - 1 Sigma Line Style

- Need to understand for any given development methodology how the skilled manpower builds up and rolls off a project.
  - Agile
  - Waterfall
  - Package Implementation
  - Etc.



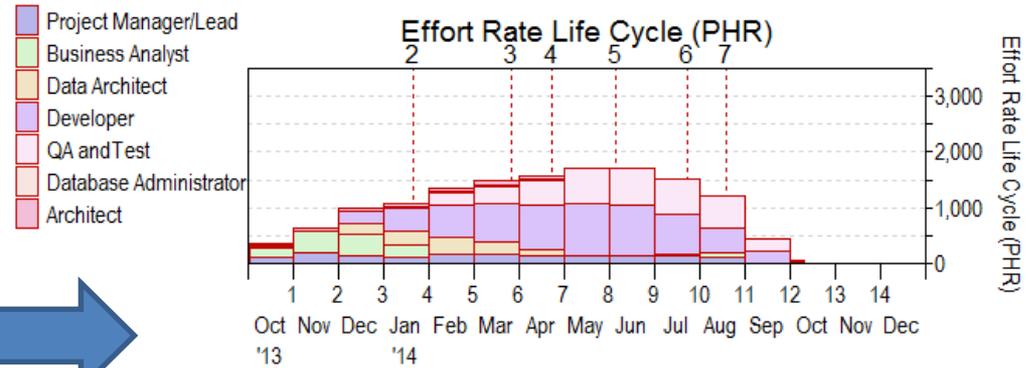
# Common Practice vs Best Practice Labor Hour Estimates

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## Most Common Industry Practice Today

Skill Category	Effort (PHR)	% Effort
Project Manager/Lead	2,076	12.79
Business Analyst	1,461	9.00
Data Architect	1,487	9.16
Developer	6,343	39.08
QA and Test	3,974	24.48
Database Administrator	280	1.72
Architect	611	3.76
<b>Total</b>	<b>16,231</b>	<b>100.00</b>

## Best Practice Estimates Breakdown Effort by Skill by Month



**This approach doesn't help the organization determine when these resources are need as the project progresses.**

Effort Rate Life Cycle (PHR) - Project X

Months*	Month	Project Manager/Lead	Business Analyst	Data Architect	Developer	QA and Test	Database Administrator	Architect
1	10/13	144.41	240.68	48.14	0.00	0.00	0.00	48.14
2	11/13	233.43	402.90	95.12	35.31	0.00	0.00	80.58
3	12/13	175.80	411.24	206.78	302.38	0.00	0.00	82.25
4	01/14	148.30	247.30	288.78	438.35	48.80	17.36	75.50
5	02/14	213.67	0.00	337.84	607.22	238.32	62.09	93.14
6	03/14	217.75	0.00	252.54	730.26	341.20	68.52	102.78
7	04/14	200.37	0.00	133.58	817.28	462.25	59.76	84.36
8	05/14	194.62	0.00	38.90	972.59	661.36	38.90	38.90
9	06/14	188.72	0.00	37.74	943.62	690.73	21.39	5.03
10	07/14	164.90	57.45	32.98	733.54	648.43	11.70	0.00
11	08/14	131.69	101.77	16.96	473.86	592.59	0.00	0.00
12	09/14	55.25	0.00	0.00	248.64	248.64	0.00	0.00
13	10/14	9.24	0.00	0.00	41.60	41.60	0.00	0.00

**This approach identifies what skills are needed when and can easily feed a PPM system where specific people can be allocated to the project.**

# Skills Profile Configuration

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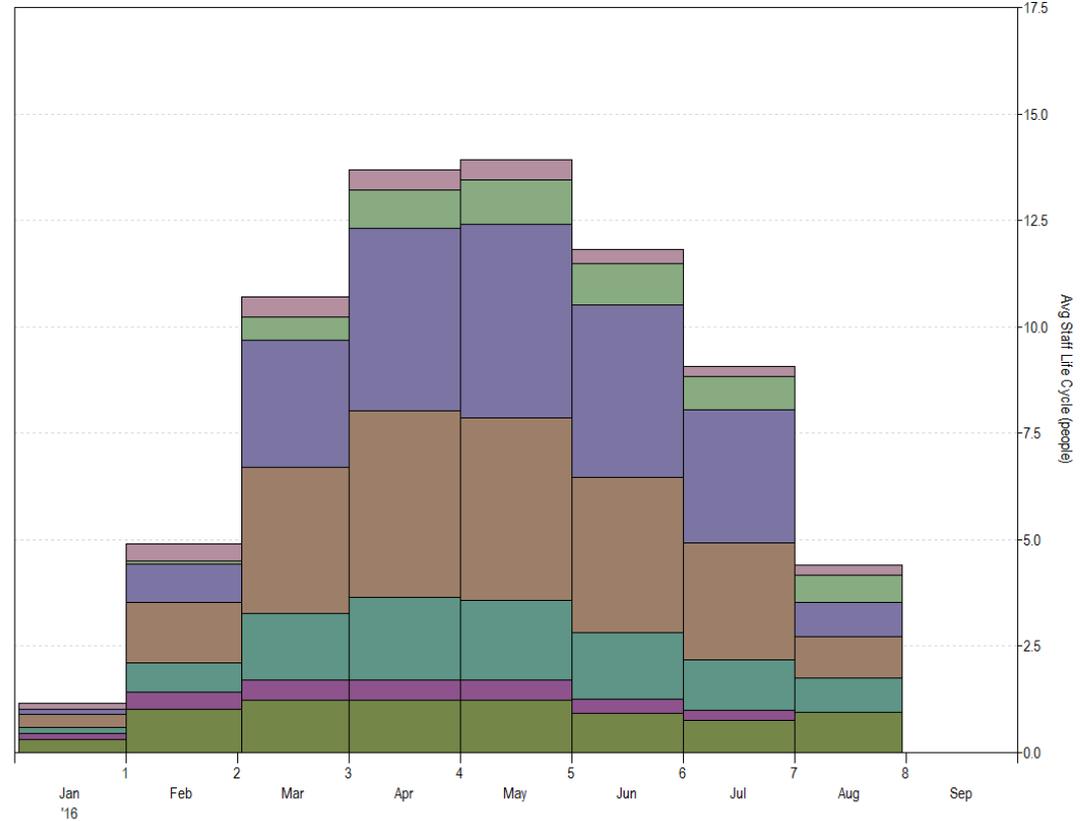
- Enterprise Services
- Application Support
- Developer
- Business Analyst/Testing
- Technical Lead
- Architect
- Project Management

Configuration Options | Skill Categories | Skill Allocations

Skill Category Name	Acronym	External ID (optional)	Labor Rate (USD per hour)
Project Management	PM		89
Architect	ARC		83
Technical Lead	TL		77
Business Analyst/Testing	BATST		80
Developer	DEV		33
Application Support	APP		50
Enterprise Services	ENT		50

Skill Category	Phase 1		Phase 2		Phase 3		Phase 4	
	1		2		3		4	
Project Management	1.00	F	0.50	F	0.75	F	1.00	F
Architect	0.25	F	0.25	F	0.25	F		%
Technical Lead	50	%	25	%	15	%	25	%
Business Analyst/Testing	50	%	50	%	35	%	30	%
Developer		%	25	%	40	%	25	%
Application Support		%		%	10	%	20	%
Enterprise Services		%	0.25	F	0.25	F	0.25	F

Avg Staff Life Cycle (people)  
Trend Based Solution



# Step 2 Release Estimates



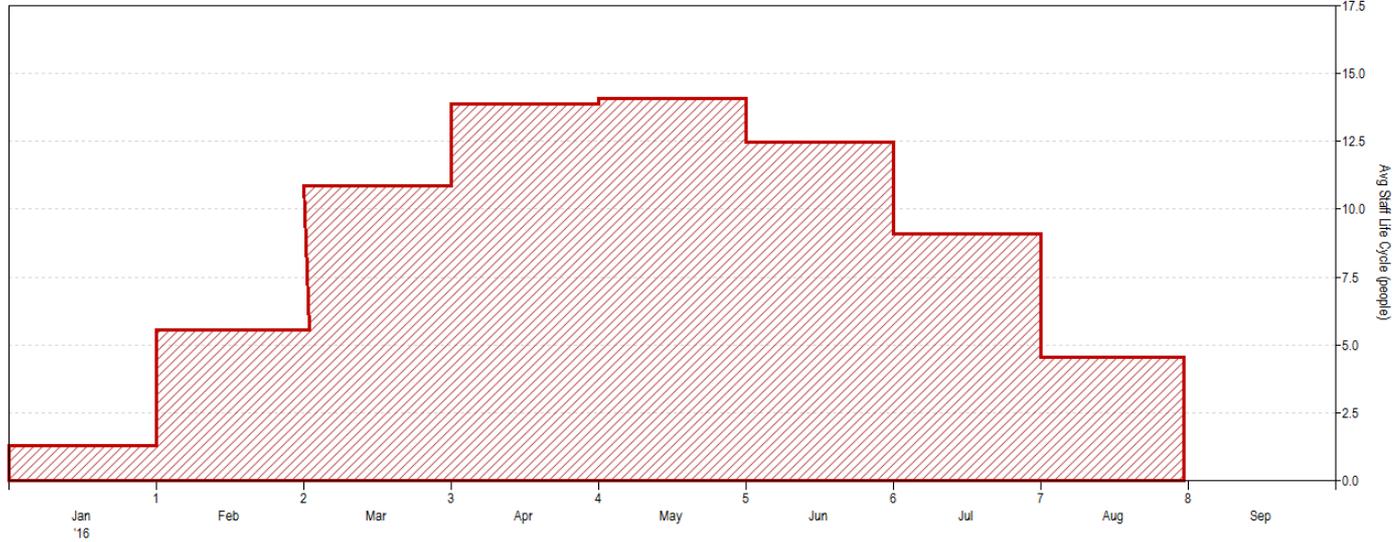
- Business and IT actors discuss and agree on scope
- If IT team has an estimate we reverse engineer it and test for reasonableness
- If no estimate exists create trend-based solution then play out scenarios based on constraints
- Put IT team and tool based estimates under configuration management



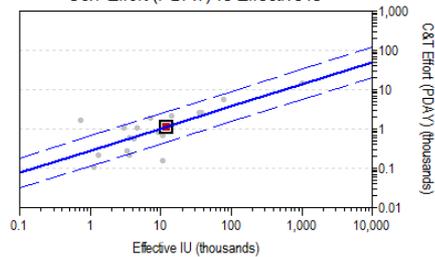
# A Trend Based Estimate

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Avg Staff Life Cycle (people)  
Trend Based Solution



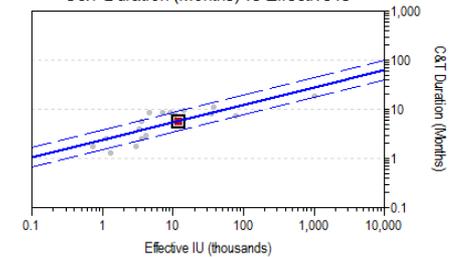
C&T Effort (PDAY) vs Effective IU



SOLUTION PANEL - Trend Based Solution

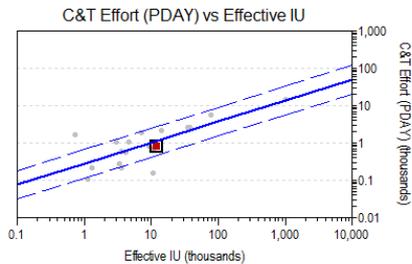
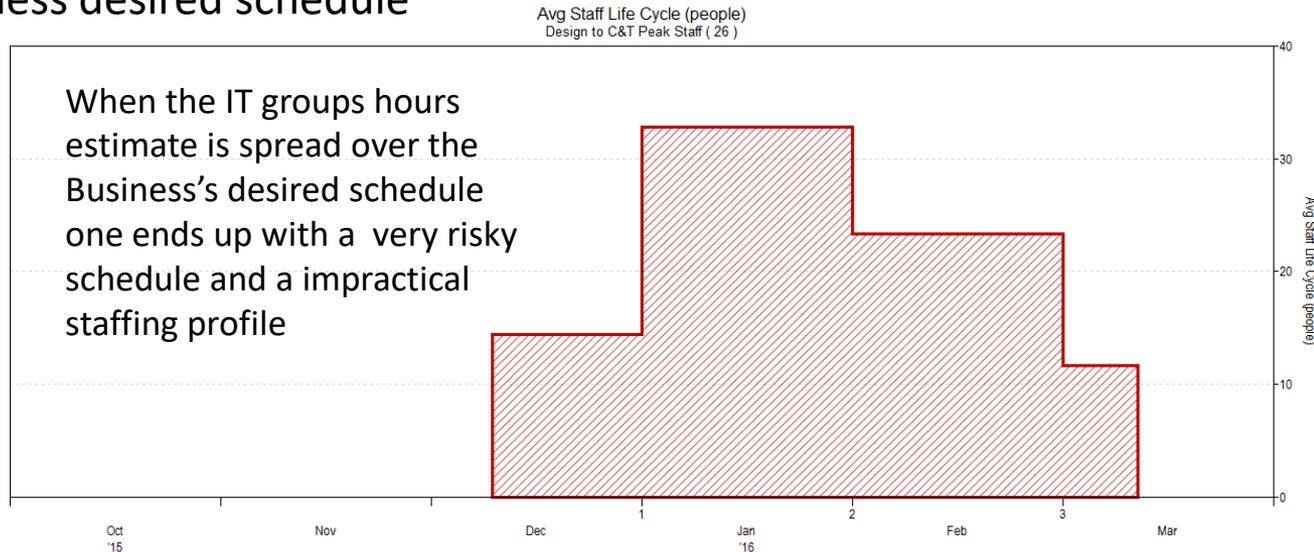
	C&T	Life Cycle	
Duration	5.8	8.0	Months
Effort	1,116	1,531	PDAY
Cost	543.3	776.0	USD (K)
Peak Staff	11.9	14.1	people
Average Staff	8.86	8.88	ppl/month
MTTD	1.582	4.133	Days
Start Date	2/7/2016	1/1/2016	
<b>PI=11.9 MBI=5.9 Eff IU=12,000</b>			

C&T Duration (Months) vs Effective IU



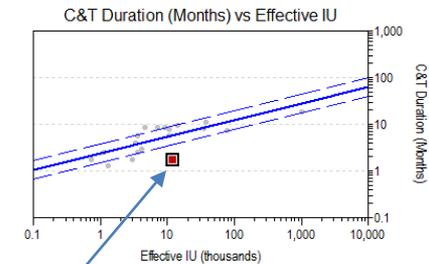
1. Agreed scope baseline
2. IT groups role based hour estimate
3. Business desired schedule

When the IT groups hours estimate is spread over the Business's desired schedule one ends up with a very risky schedule and a impractical staffing profile



SOLUTION PANEL - Design to C&T Peak Staff ( 26 )

	C&T	Life Cycle	
Duration	1.7	3.1	Months
Effort	837	1,321	PDAY
Cost	394.9	651.2	USD (K)
Peak Staff	26.1	32.8	people
Average Staff	22.37	19.96	ppl/month
MTTD	0.550	27.488	Days
Start Date	12/21/2015	12/10/2015	
<b>PI=19.0 MBI=10.7 Eff IU=12,000</b>			



High Risk compared to history

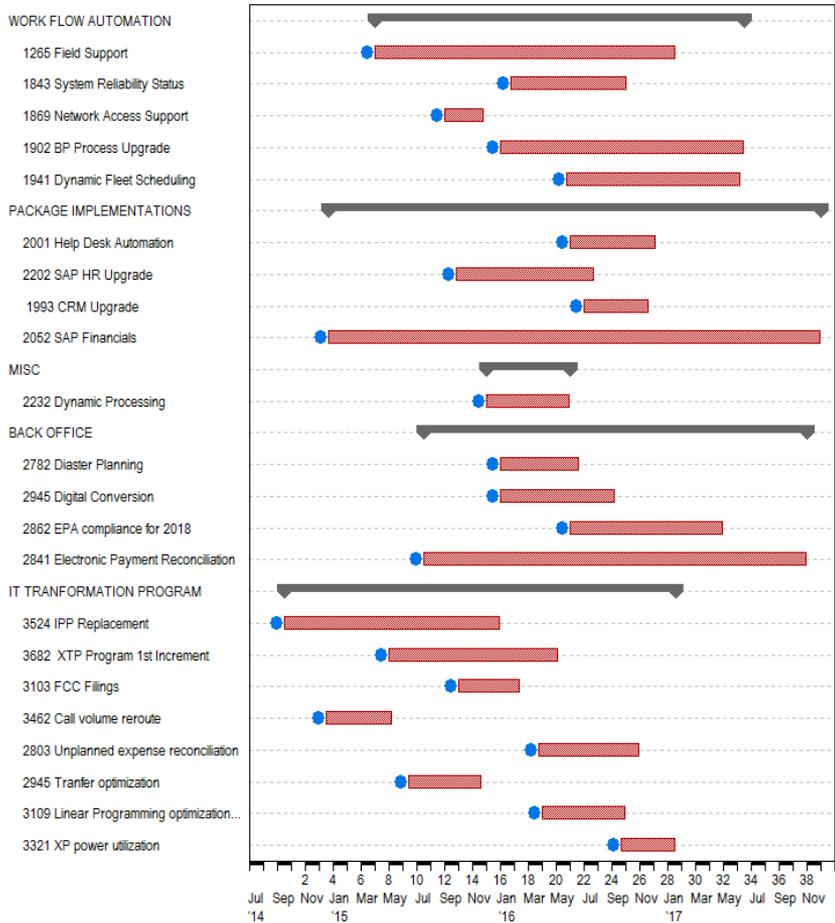
## Step 3 – Assessing Risk and Waste at the Portfolio level



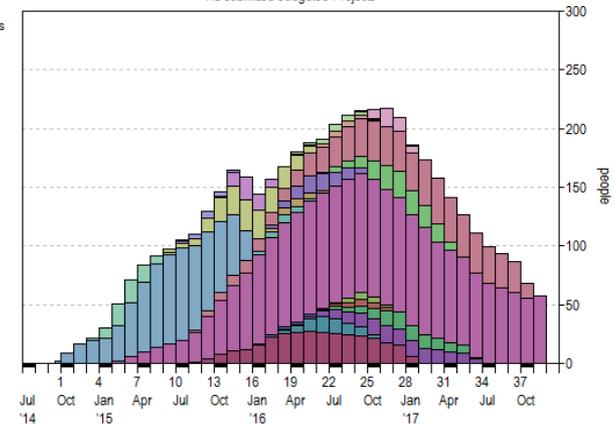
# A View at the Portfolio Level

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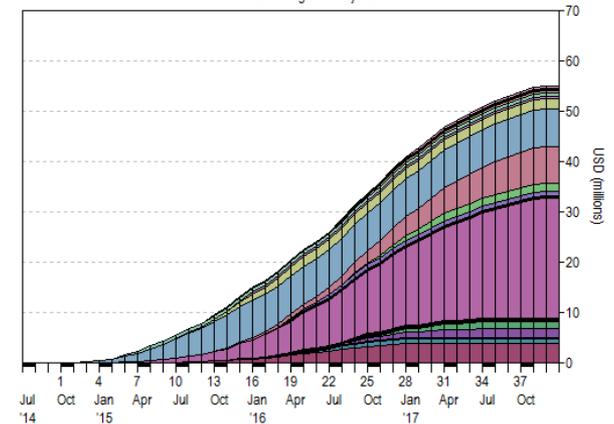
Monthly Gantt Chart (L9)  
< As submitted budgeted Projects >



Monthly Avg Staff (L3)  
< As submitted budgeted Projects >



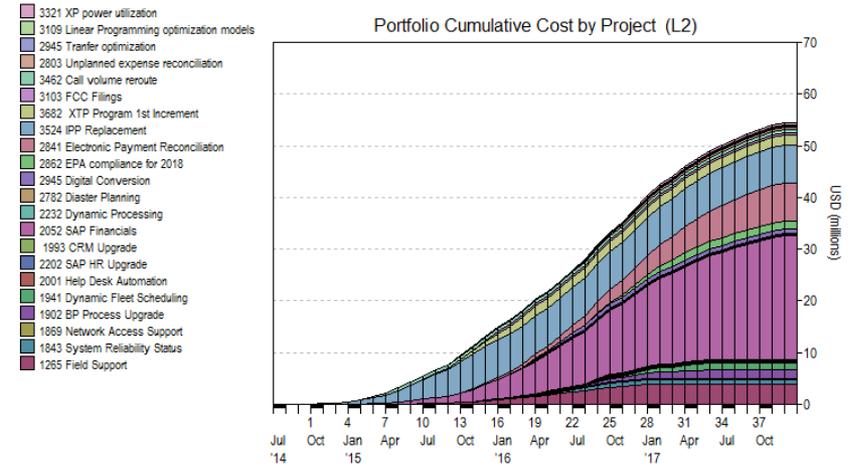
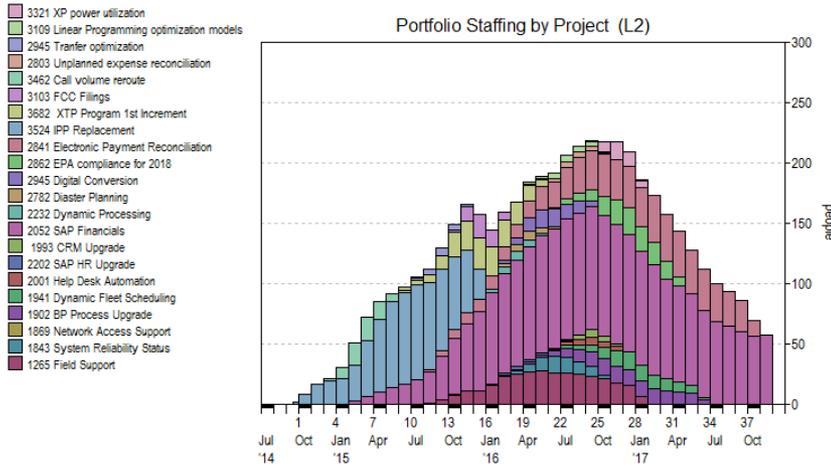
Monthly Cum Cost (L3)  
< As submitted budgeted Projects >



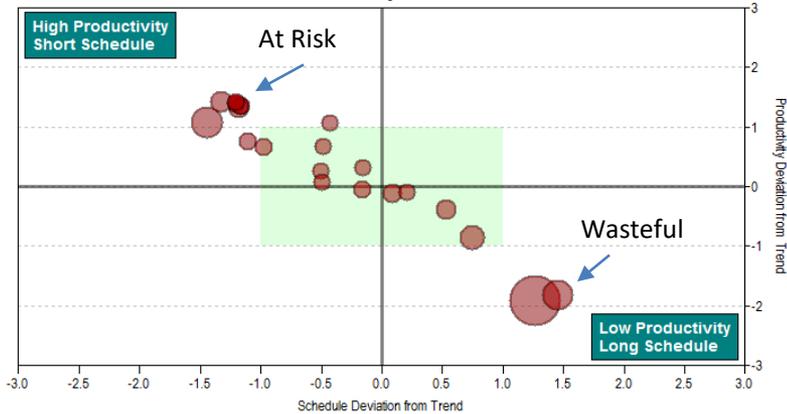
# Identifying “at Risk” and “Wasteful” Projects

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Portfolio Resource & Risk Quadrant

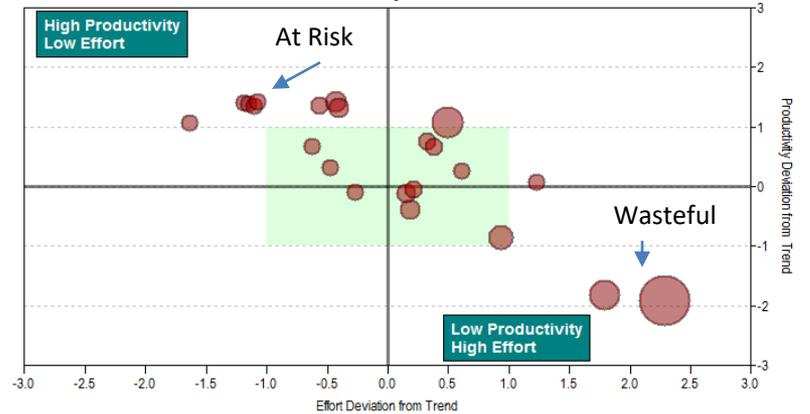


IT Projects Productivity Assumption versus Schedule Months  
Deviations from Average Customer Trend



Bubble Size reflects relative Total Cost

IT Projects Productivity Assumption versus Effort  
Deviations from Average Customer Trend



Bubble Size reflects relative Total Cost

- Reconciliation required when
  - Estimates are outside the “target zone”
  - Significant difference between team and tool based estimates
  - Significant project/program requires deep dive to improve confidence
- Adjustments
  - Are there any justifications for changing productivity assumptions?
    - Relevant Historical data
    - Unique circumstances
  - Is there better information about constraints
    - Budget/Cost/Staffing/Schedule/Release packaging
- Alternatives explored and official position is established

# Step 5. Portfolio Assessment

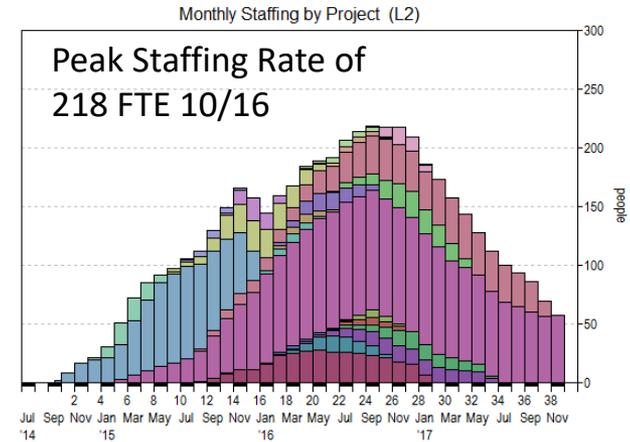
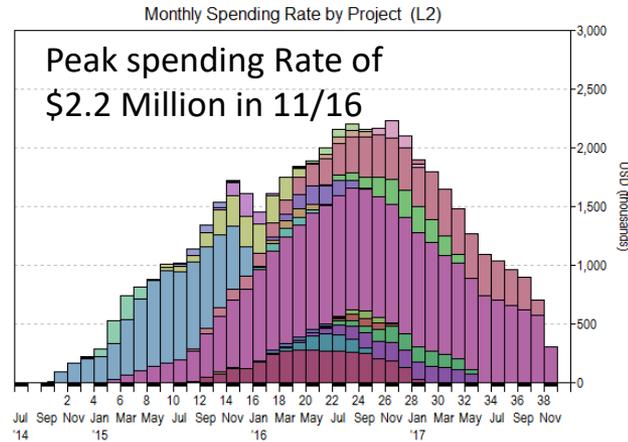


- Typical Scenarios to be Evaluated
  - Portfolio “as submitted” – Identification of risk and potential savings
  - Portfolio adjusted for “risk and waste” - Optimized to the capability of the organization
  - Portfolio adjusted for organization capacity or financial constraints – Optimized to meet the needs of the C level decision makers

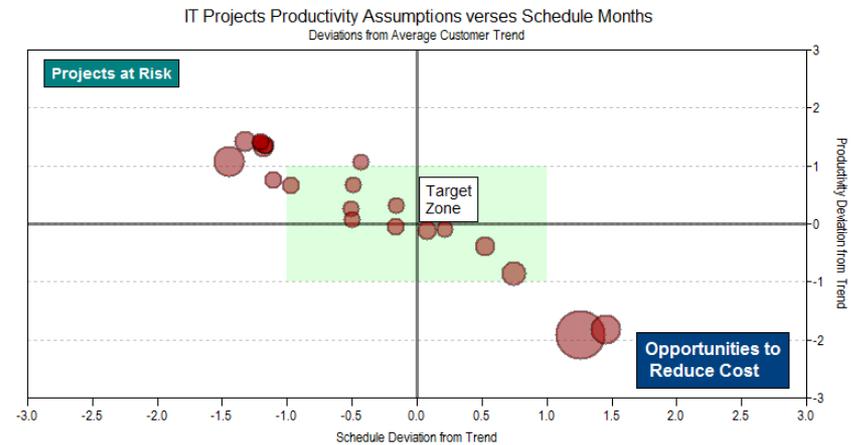
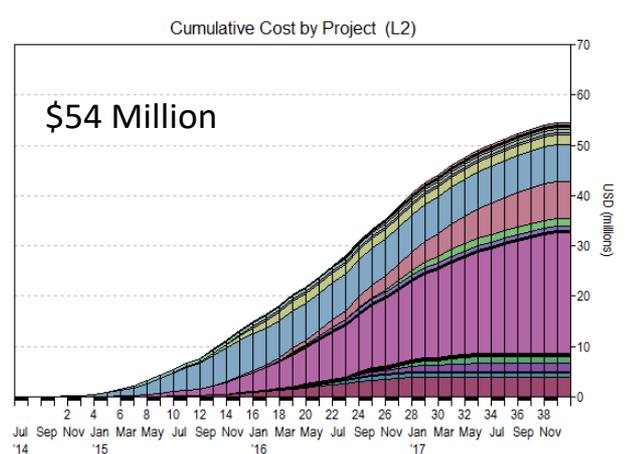
# “As Submitted” Portfolio

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## Portfolio Cost and Risk Profile Quadrant



- 3321 XP power utilization
- 3109 Linear Programming optimization models
- 2945 Transfer optimization
- 2803 Unplanned expense reconciliation
- 3462 Call volume reroute
- 3103 FCC Filings
- 3682 XTP Program 1st Increment
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Bubble Size reflects relative Total Cost

# Adjustment Process

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### What If

	Solution Method	IU	PI	Peak Staff	
<b>2 Package Implementations</b>					
2.1	2001 Help Desk Automation	Current Staff Buildup Rate	13920	16.6	7.3
2.2	2202 SAP HR Upgrade	Current Staff Buildup Rate	25000	16.6	4.0
2.3	1993 CRM Upgrade	Current Staff Buildup Rate	5280	15.1	6.4
2.4	2052 SAP Financials	Current Staff Buildup Rate	180000	11.0	90.1
<b>3 MISC</b>					
3.1	2232 Dynamic Processing	Current Staff Buildup Rate	11760	16.3	7.3
<b>4 Back Office</b>					
4.1	2782 Diaster Planning	Current Staff Buildup Rate	9900	15.9	7.3
4.2	2945 Digital Conversion	Current Staff Buildup Rate	35000	18.0	15.4
4.3	2862 EPA compliance for 2...	Current Staff Buildup Rate	85000	19.4	21.5
4.4	2841 Electronic Payment R...	Current Staff Buildup Rate	45000	9.0	39.9
<b>5 IT Transformation Program</b>					
5.1	3524 IPP Replacement	Current Staff Buildup Rate	354750	21.0	73.3
5.2	3682 XTP Program 1st Inc...	Current Staff Buildup Rate	140000	20.5	25.0
5.3	3103 FCC Filings	Current Staff Buildup Rate	3120	12.0	18.6
5.4	3462 Call volume reroute	Current Staff Buildup Rate	4860	13.0	20.4
5.5	2803 Unplanned expense ...	Current Staff Buildup Rate	3720	10.0	6.6

Note: Only SLIM-Estimate subsystems may be adjusted.

OK
Cancel
Help

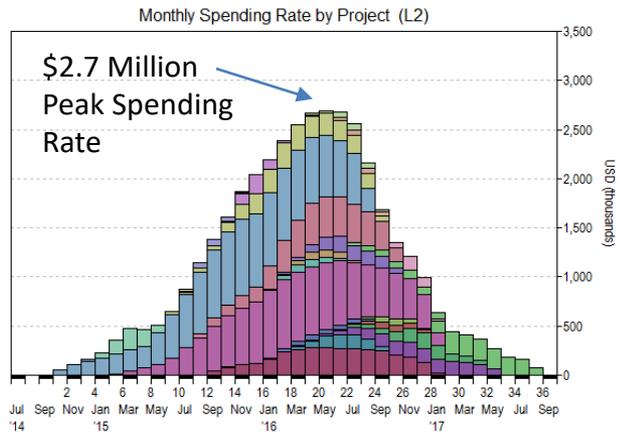
Bubble Size reflects relative Total Cost

# Portfolio Adjusted for Risk and Waste

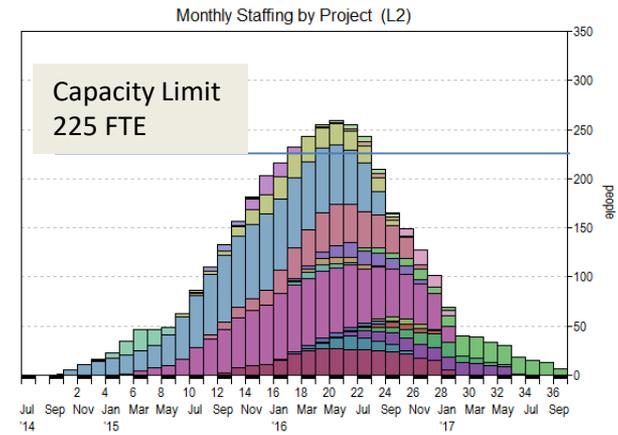
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Portfolio Cost and Risk Profile Quadrant

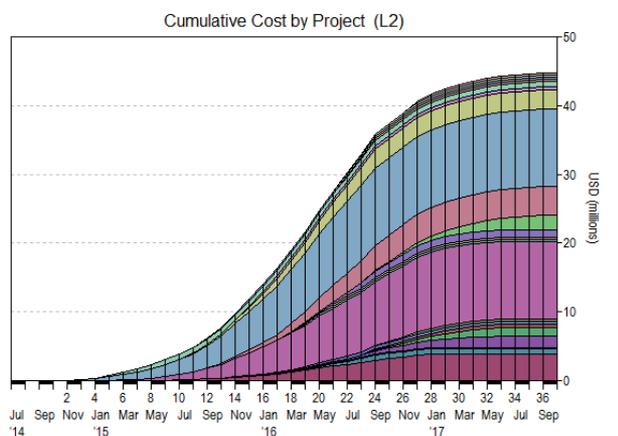
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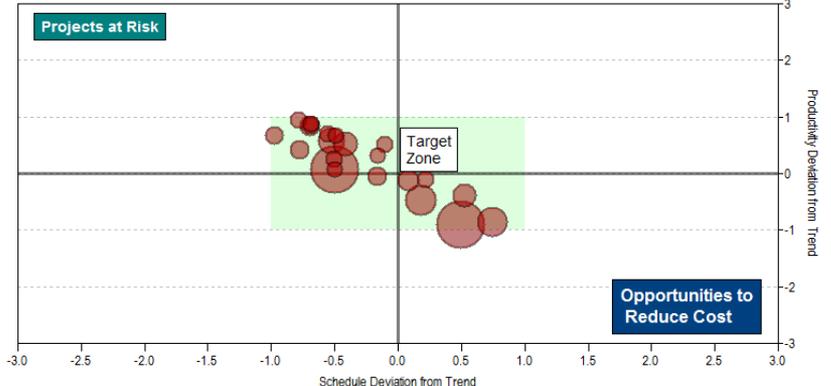
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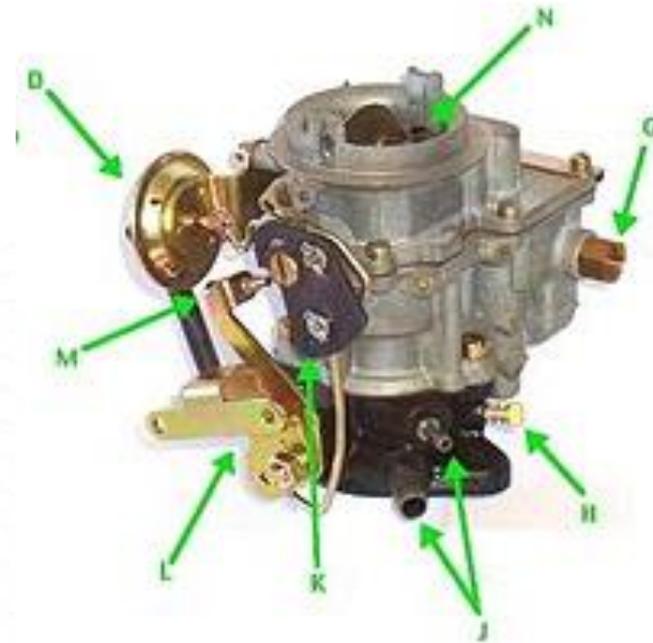
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IT Projects Productivity Assumptions versus Schedule Months



- Typical Adjustments
  - Eliminate Projects (usually not an option)
  - Slip start date (provided the project isn't under way)
  - Adjust staffing up or down to accelerate/decelerate
    - Staff Augmentation
    - Outsourcing Partners

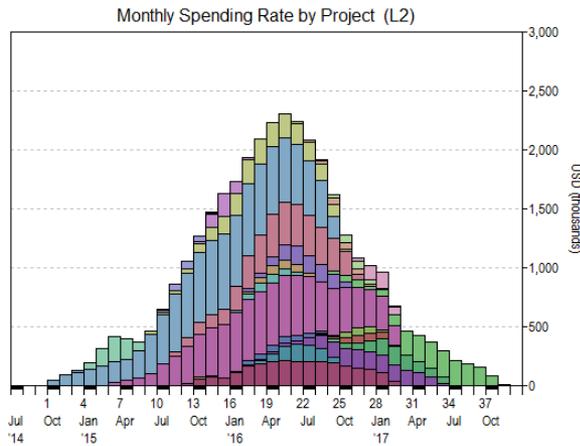


# Meeting Capacity Limits

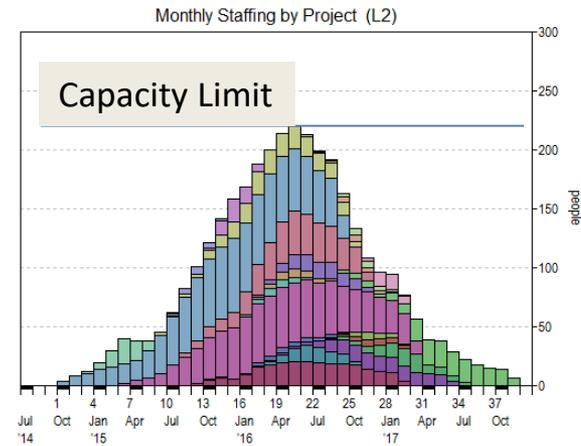
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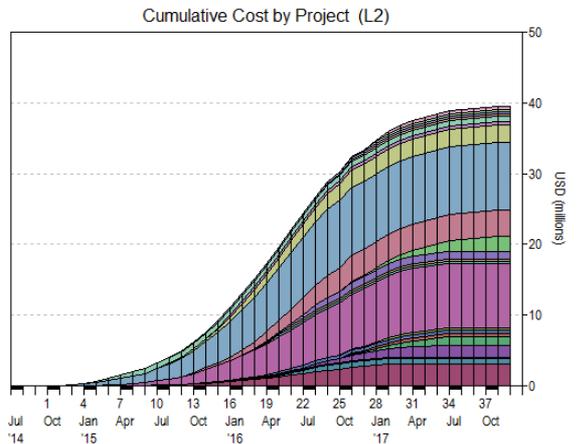
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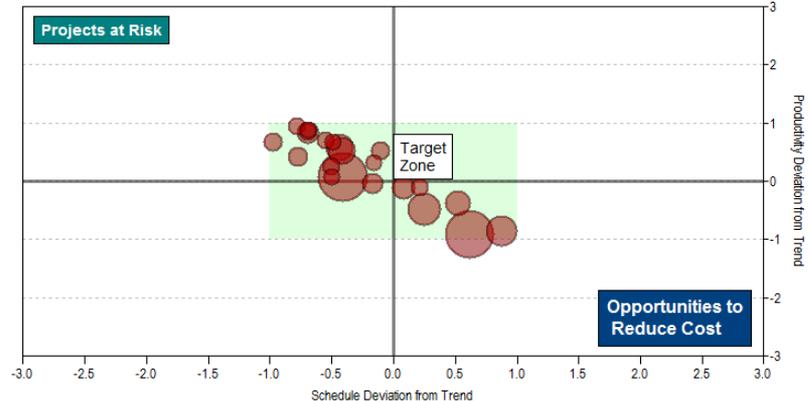
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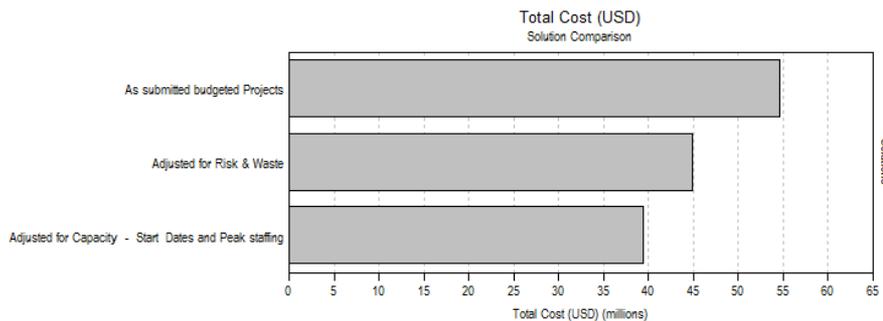
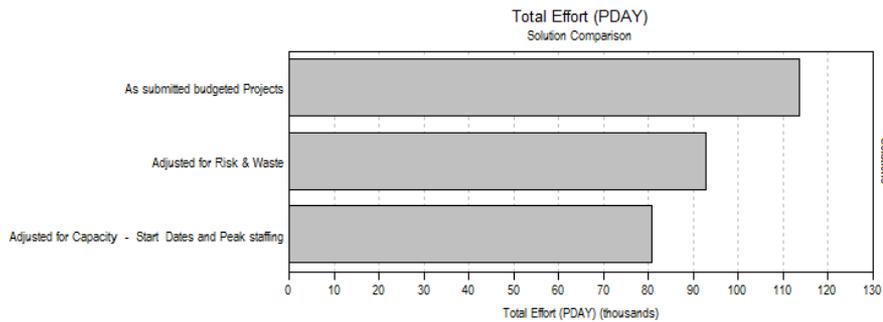
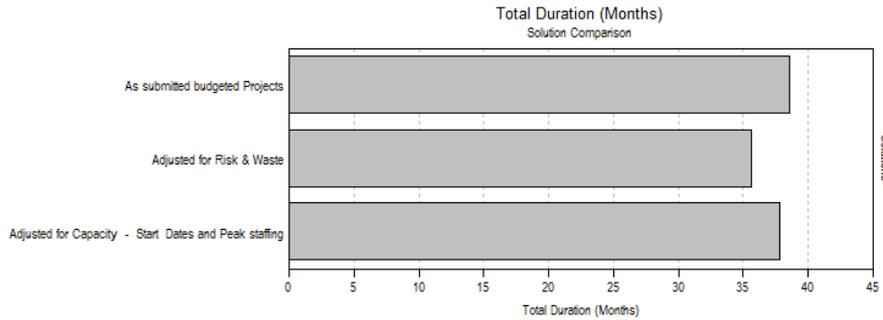
To meet the capacity limit

- 5 projects were delayed by 3 months
- 3 projects required staff modest reductions

# Comparing Portfolio Alternatives

The Intelligence behind  
Successful Software Projects

## Comparison of Logged Solutions



<b>Total Duration (Months)</b> Solution Comparison	
<b>Solution</b>	<b>Total Duration (Months)</b>
As submitted budgeted Projects	38.57
Adjusted for Risk & Waste	35.63
Adjusted for Capacity - Start Dates and Peak sta...	37.77

<b>Total Effort (PDAY)</b> Solution Comparison	
<b>Solution</b>	<b>Total Effort (PDAY)</b>
As submitted budgeted Projects	113,522.92
Adjusted for Risk & Waste	92,683.74
Adjusted for Capacity - Start Dates and Peak sta...	80,809.55

<b>Total Cost (USD)</b> Solution Comparison	
<b>Solution</b>	<b>Total Cost (USD)</b>
As submitted budgeted Projects	54,651,480
Adjusted for Risk & Waste	44,930,766
Adjusted for Capacity - Start Dates and Peak sta...	39,421,485

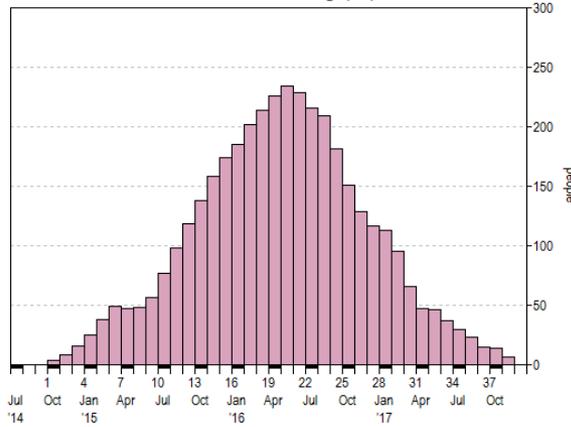
- Ability to identify when resources or various skill types are required
- Ability to play out scenarios that optimize resource allocation
- Provides
  - Staffing & effort by skill categories at project level
  - Staffing & effort by skill categories at product line level
  - Staffing & effort by skill category at the portfolio level

# Resource Management Views

The Intelligence behind Successful Software Projects

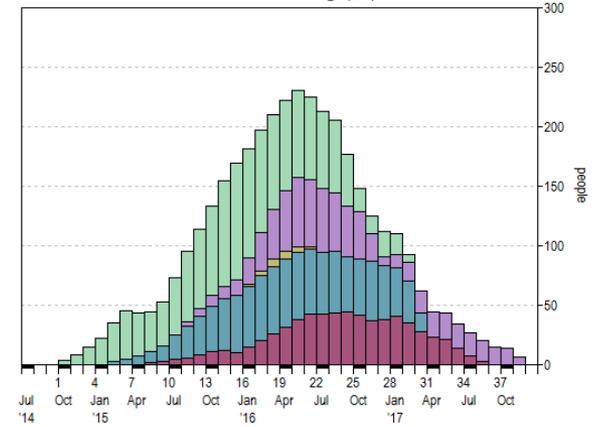
## Sample ResourceViews

Portfolio Level Staffing (L0)



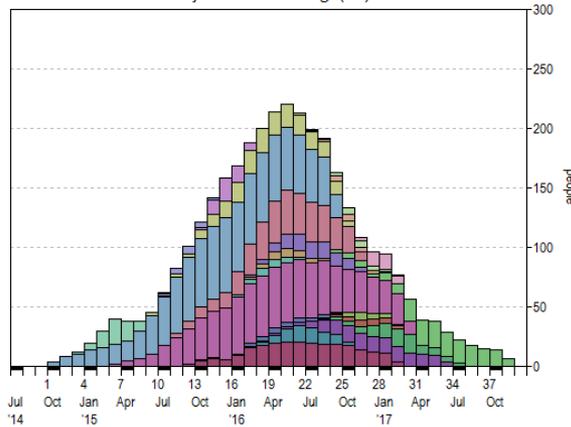
- IT Transformation Program
- Back Office
- MISC
- Package Implementations
- Work Flow Automation

Product line Staffing (L1)



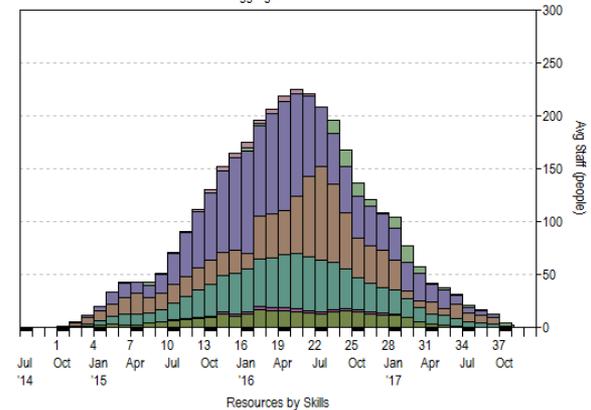
- 3321 XP power utilization
- 3109 Linear Programming optimization models
- 2945 Transfer optimization
- 2803 Unplanned expense reconciliation
- 3462 Call volume reroute
- 3103 FCC Filings
- 3682 XTP Program 1st Increment
- 3524 IPP Replacement
- 2841 Electronic Payment Reconciliation
- 2862 EPA compliance for 2018
- 2945 Digital Conversion
- 2782 Disaster Planning
- 2232 Dynamic Processing
- 2052 SAP Financials
- 1993 CRM Upgrade
- 2202 SAP HR Upgrade
- 2001 Help Desk Automation
- 1941 Dynamic Fleet Scheduling
- 1902 BP Process Upgrade
- 1869 Network Access Support
- 1843 System Reliability Status
- 1265 Field Support

Project Level Staffing (L2)



- Enterprise Services
- Application Support
- Developer
- Business Analyst
- Technical Lead
- Architect
- Project Management

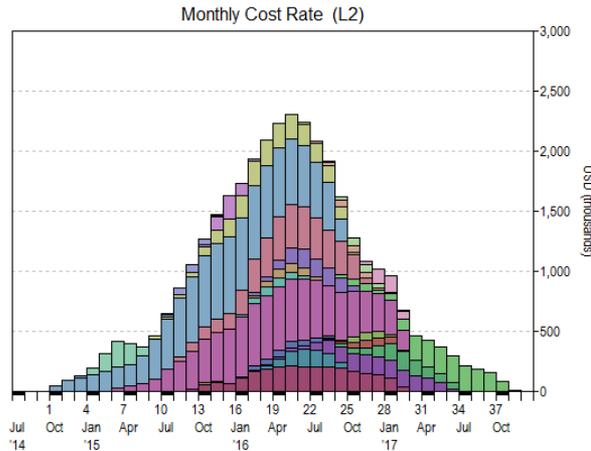
Avg Staff (people)  
Aggregated Skills



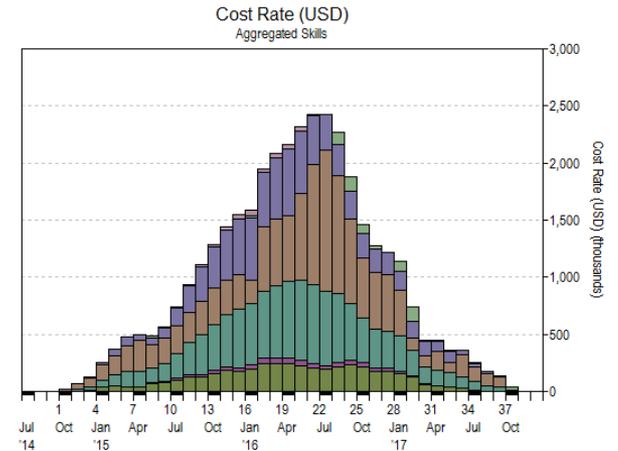
- Ability to quickly play out and compare financial scenarios at the portfolio, product line and project level.
- Provides (at the portfolio/product line or project level)
  - Estimated total cost
  - Estimated total hours
  - Monthly spending rate
  - Hours per month expenditure
  - Estimated total cost by labor skill
  - Monthly cost by labor skill

## Sample Financial Views

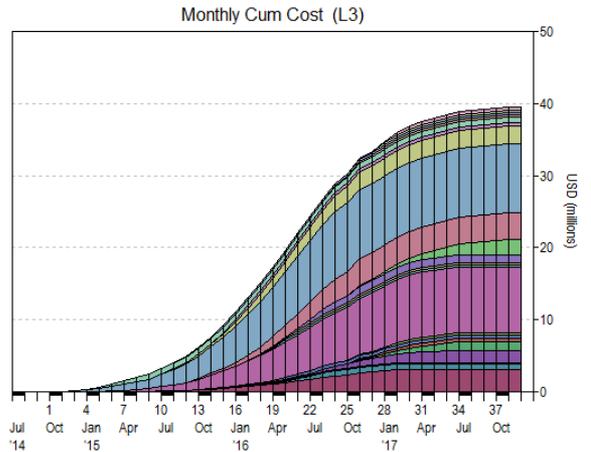
- 3321 XP power utilization
- 3109 Linear Programming optimization models
- 2945 Transfer optimization
- 2803 Unplanned expense reconciliation
- 3482 Call volume reroute
- 3103 FCC Filings
- 3682 XTP Program 1st Increment
- 3524 IPP Replacement
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- 2001 Help Desk Automation
- 1941 Dynamic Fleet Scheduling
- 1902 BP Process Upgrade
- 1869 Network Access Support
- 1843 System Reliability Status
- 1285 Field Support



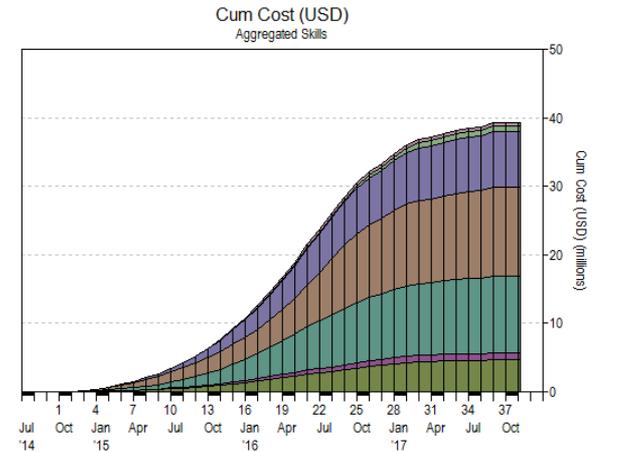
- Enterprise Services
- Application Support
- Developer
- Business Analyst
- Technical Lead
- Architect
- Project Management



- 3321 XP power utilization
- 3109 Linear Programming optimization models
- 2945 Transfer optimization
- 2803 Unplanned expense reconciliation
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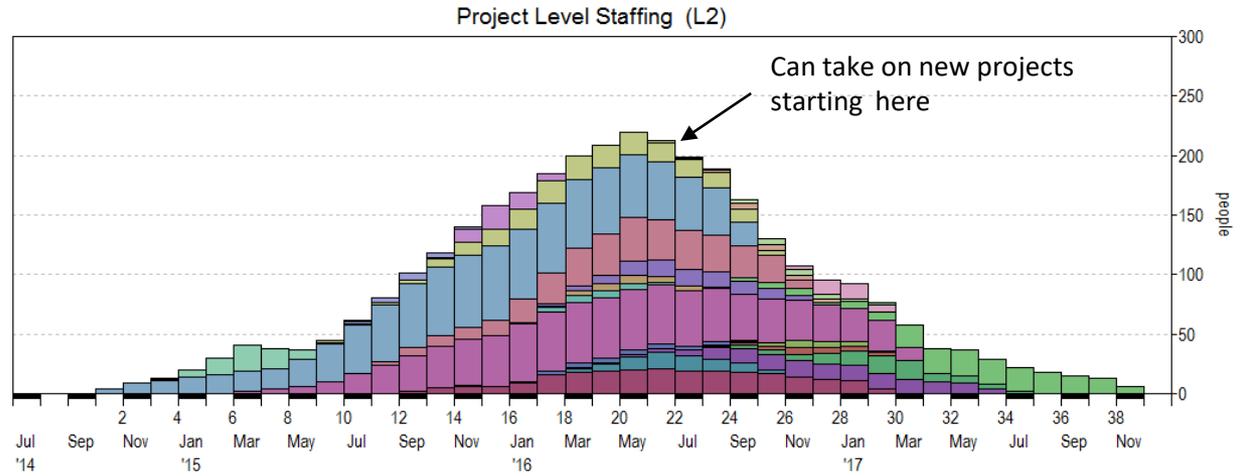
- Enterprise Services
- Application Support
- Developer
- Business Analyst
- Technical Lead
- Architect
- Project Management



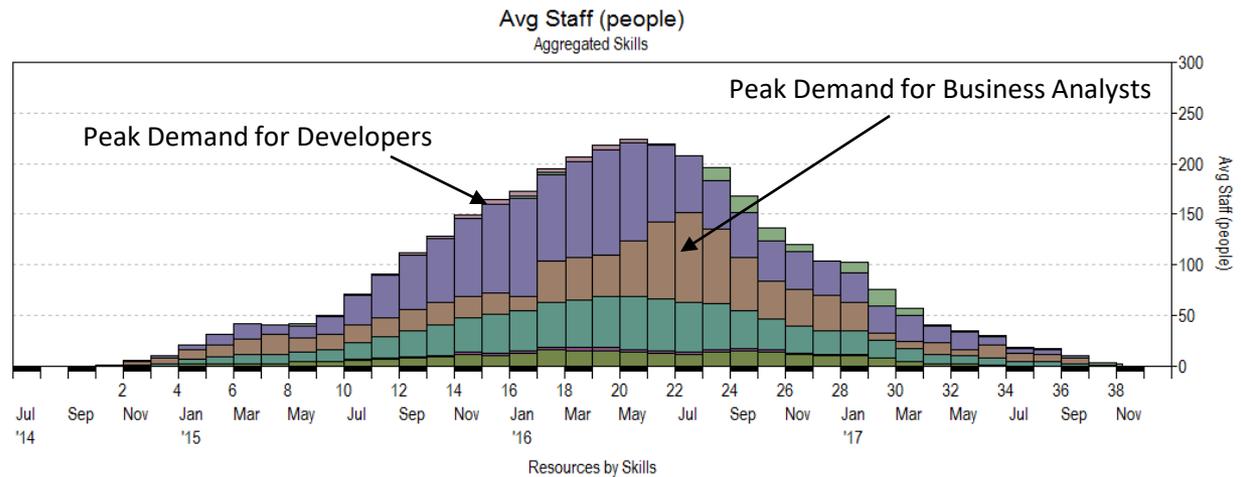
- Ability to predict the demand for IT resources enabling sound capacity planning – balancing
- Provides
  - Demand by staffing and skill level
  - Identifies peak demand
  - Identifies when new project can be added to the pipeline based on capacity constraints
  - Can play out what-if scenarios to balance demand to capacity

## Sample ResourceViews

- 3321 XP power utilization
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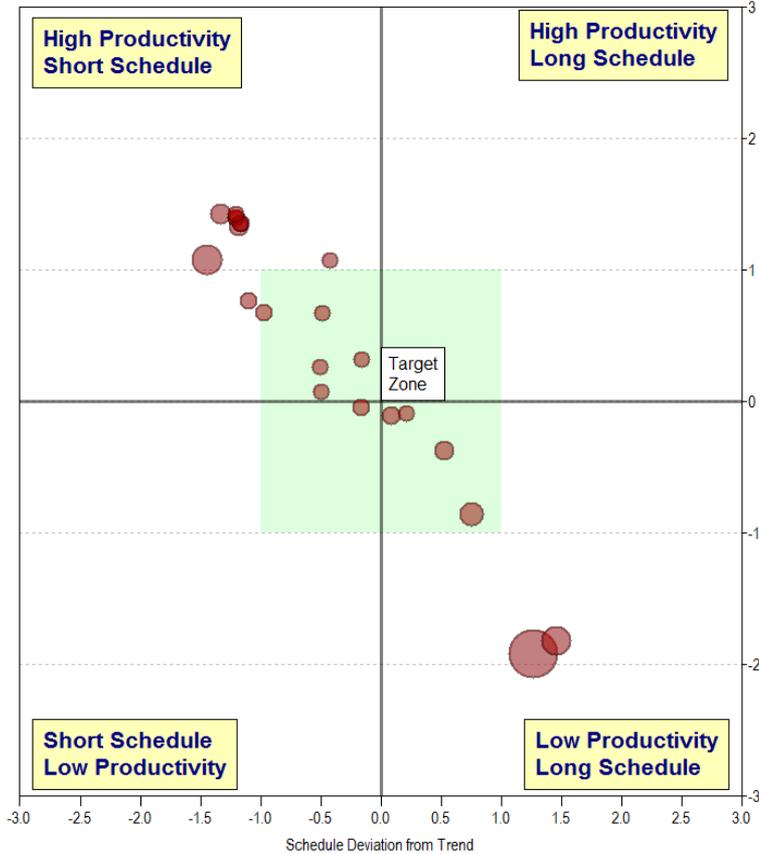
- Enterprise Services
- Application Support
- Developer
- Business Analyst
- Technical Lead
- Architect
- Project Management



- Early identification of Risky Projects
- Better ability to negotiate unrealistic expectations
- Ability to evaluate the “Risk profile” of the entire portfolio
- Ability to play out scenarios that reduce schedule and cost risk

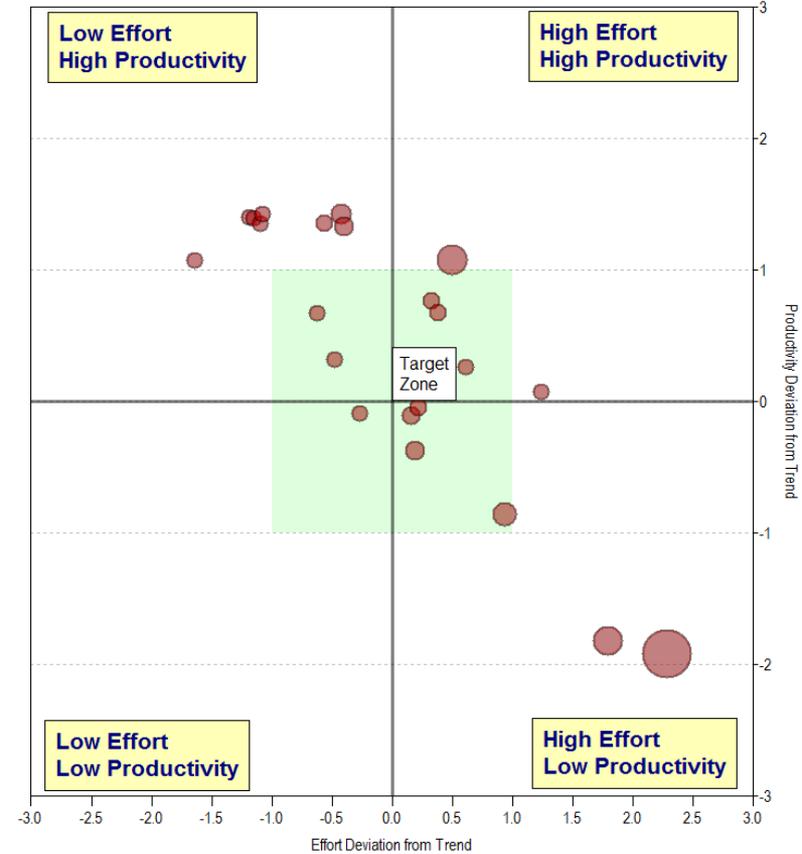
## IT Portfolio Projects - Productivity vs Schedule & Effort

"As Submitted" IT Projects Productivity versus Schedule Months  
Deviations from Average Customer Trend



Bubble Size reflects relative Total Cost

"As Submitted" IT Projects Productivity versus Effort  
Deviations from Average Customer Trend



Bubble Size reflects relative Total Cost

**Company X Portfolio**

- Work Flow Automation
  - 1265 Field Support
  - 1843 System Reliability Status
  - 1869 Network Access Support
  - 1902 BP Process Upgrade
  - 1941 Dynamic Fleet Scheduling
- Package Implementations
  - 2001 Help Desk Automation
  - 2202 SAP HR Upgrade
  - 1993 CRM Upgrade
  - 2052 SAP Financials
- MISC

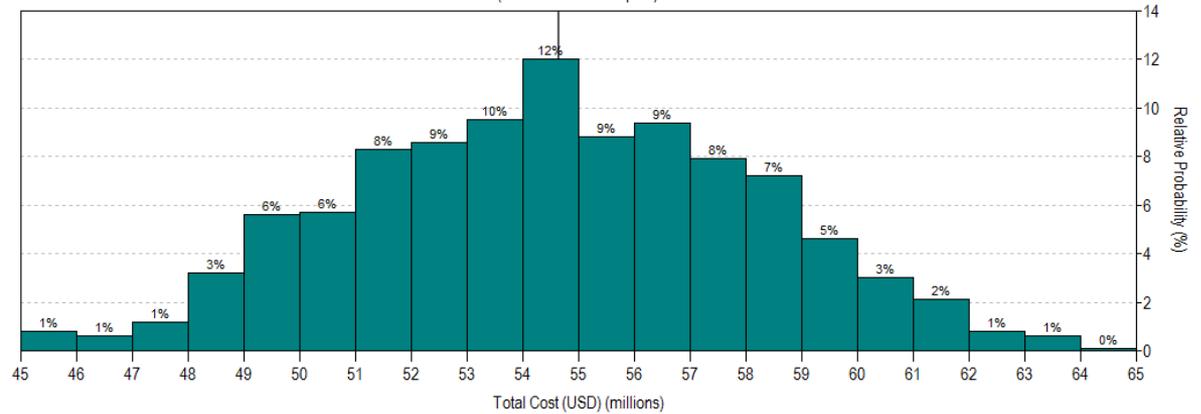
Note: Uncertainty levels can be set only for subsystem and custom tasks (shown in BO)

2. Set the uncertainty by choosing one of these 3 levels.

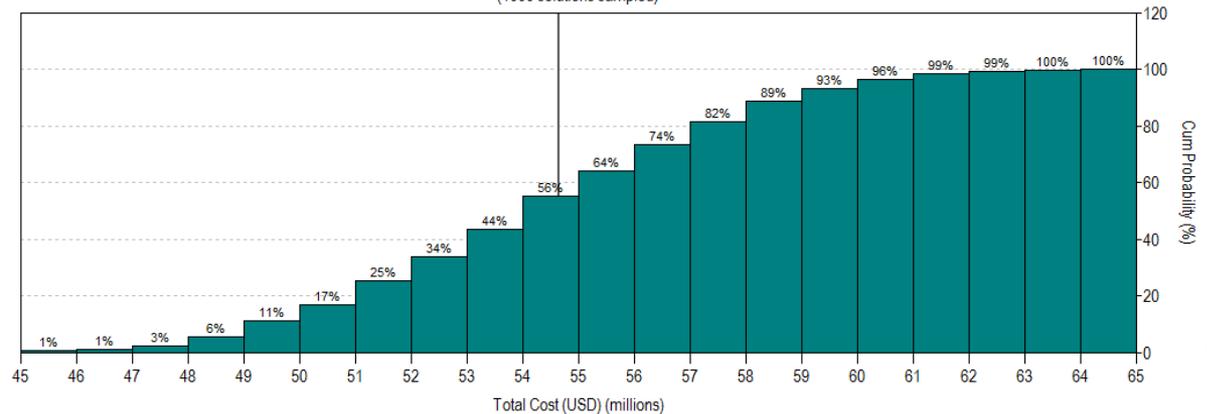
- Set selected tasks to LOW uncertainty
- Set selected tasks to MEDIUM uncertainty
- Set selected tasks to HIGH uncertainty

## Risk Profile Cost

Risk Profile: Total Cost (USD)  
(1000 solutions sampled)

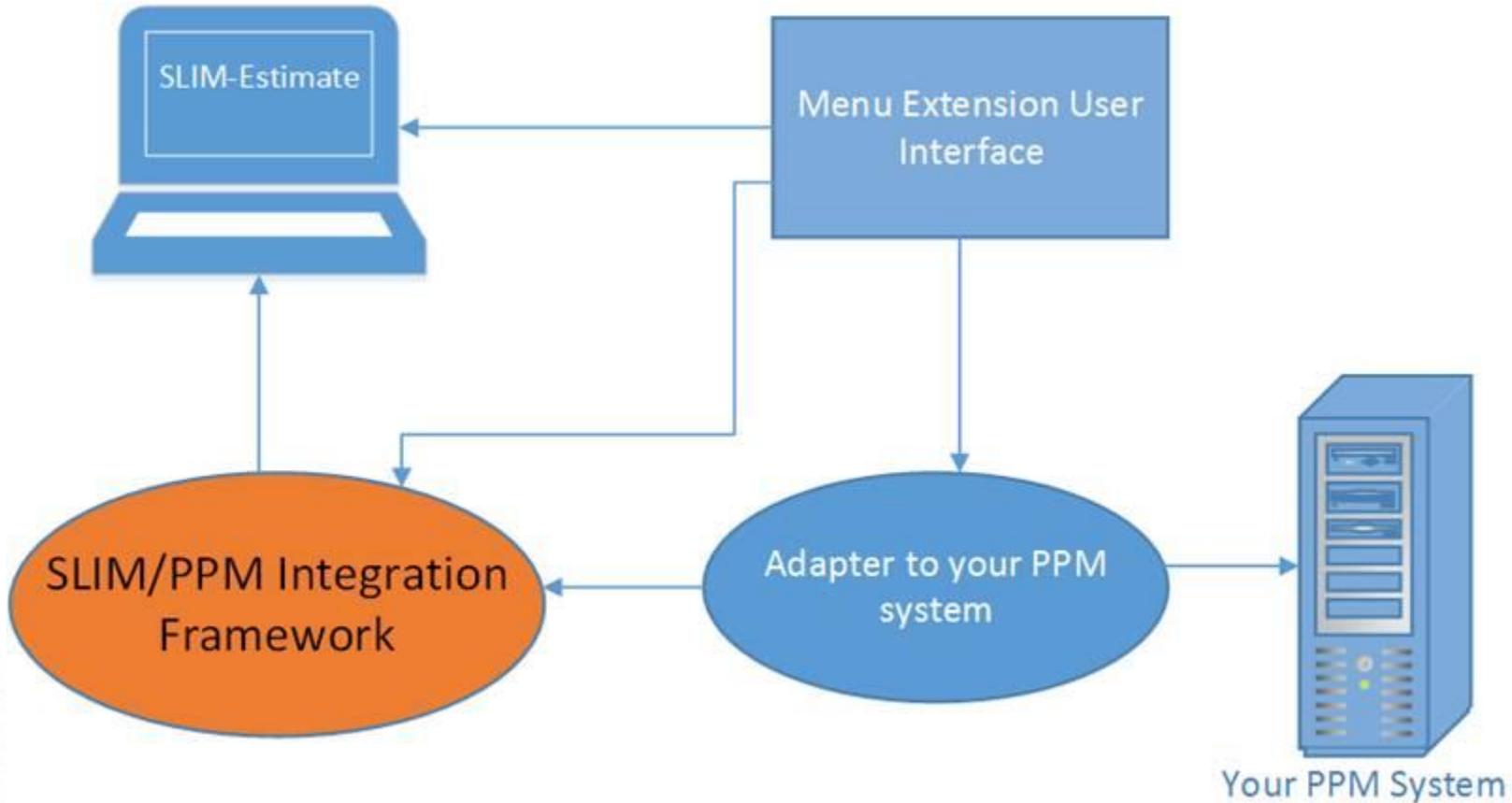


Risk Profile: Total Cost (USD)  
(1000 solutions sampled)



# Sharing Data With Corporate Systems

The Intelligence behind  
Successful Software Projects



- It is efficient with all stakeholders' time
- It focuses on having an objective process
- It has complete transparency
- Allows for rapid analysis of alternative project and portfolio scenarios
- Takes some of the pain out of the budgeting process

# Questions ?

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Doug.Putnam@qsm.com  
[www.qsm.com](http://www.qsm.com)  
800 424 6755

