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A Program Manager's Guide to Reliable Subcontractor Reporting

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Agenda

- Introduction
- Background
- Common Practice
- Discrete Practice
- Compare and Contrast
- Process
- Example and Analysis
- Summary

A Program Manager's Guide to Reliable Subcontractor Reporting

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Abstract— **Prime Government contractors execute work with significant subcontractor content. The use of discrete earned value performance measurement can be difficult and time consuming. In response, contractors may choose to utilize simpler earned value methods for subcontractor performance reporting such as Level of Effort or Percent of Estimate at Complete (EAC). However erroneous reporting of progress can result from using such methods. Shortcomings of LOE include no schedule status because the the true value of work accomplished is not reported. LOE data only reflects how much and how quickly money is being spent. Percent of Estimate at Complete provides schedule variances, but variances may not be a true reflection of schedule and cost status. The method is unreliable because it uses expenditures as a percentage of EAC as a means of measuring work accomplished such as budget cost of work performed. It only works if the subcontractor's EAC spent is equal to true percent complete. Using discrete earned value best practices provides Prime contractors and Government agencies realistic subcontractor performance that can provide objective forecast performance to identify emerging issues and develop corrective actions before significantly impacting the performance measurement baseline (PMB). This paper investigates how to implement low risk discrete earned value techniques to promote reliable and effective subcontractor reporting.**

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1. INTRODUCTION

Prime Government contractors execute work with significant subcontractor content. Figure 1 presents a context diagram showing the notional magnitude. Reporting objective performance measurement is sometimes difficult due to the lag in subcontractor reporting to the Prime, which must incorporate the data for reporting the Government. The result is "aged" subcontractor progress, which can mask potential issues and compromise forecasting accuracy. Erroneous progress can result from the method type such as *Level of Effort* (LOE) or percent spent of EAC. While an objective, discrete earning method provides more realistic reporting and forecasting results. Shortcomings of LOE include no schedule status or measurement of how much work is completed. The data only reflects how much and quickly budget is spent. *Percent of Estimate at Complete* (PEAC) is better than LOE because it provides schedule variances. However, the variances may not be a reliable indicator of actual schedule and cost status. PEAC is unreliable because

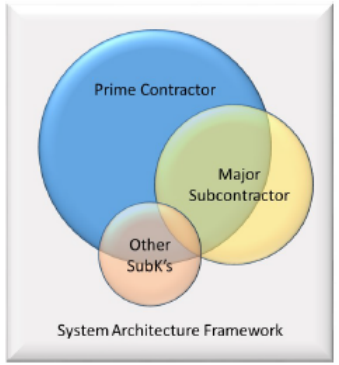

Figure 1- Major Subcontractors affect Prime contractor performance reporting based method.

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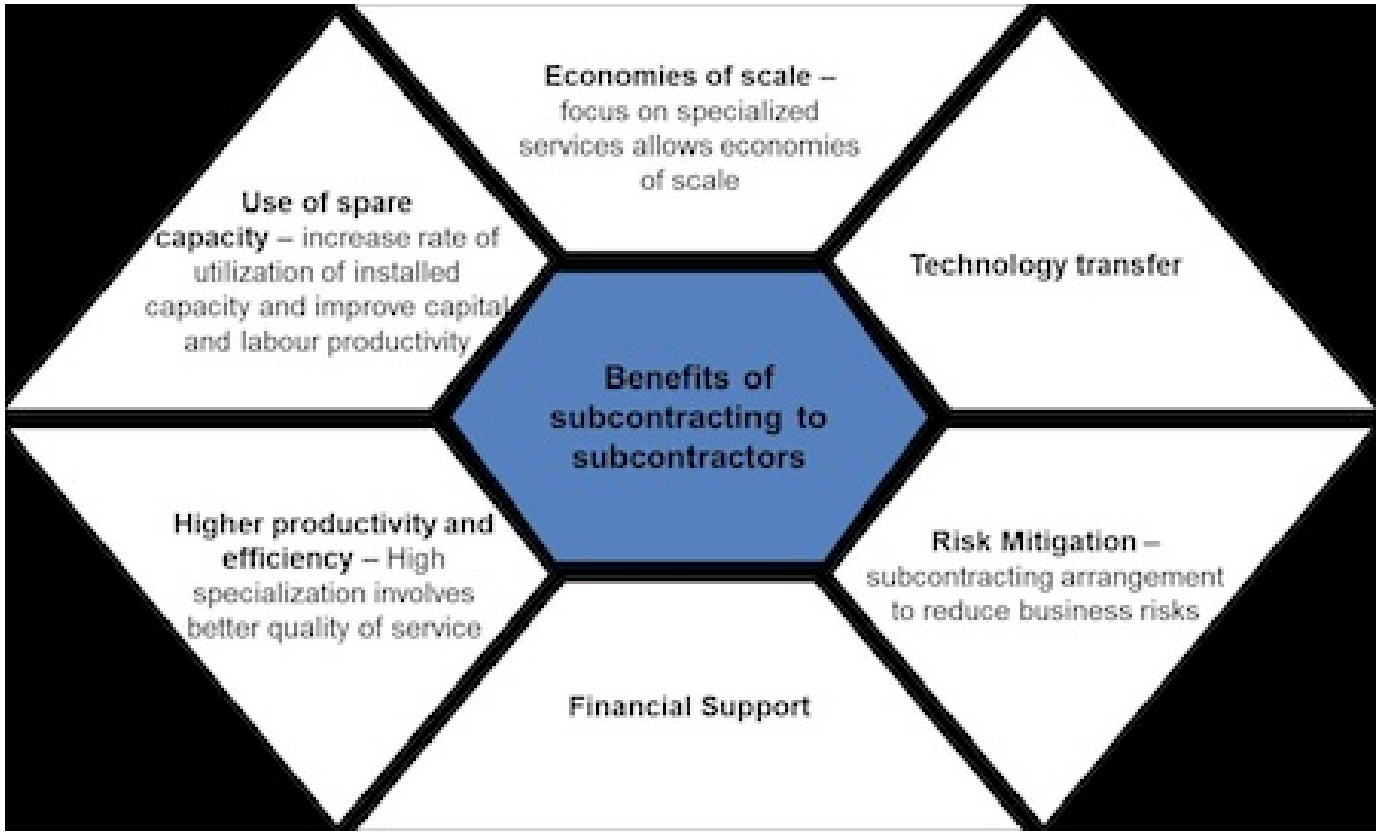
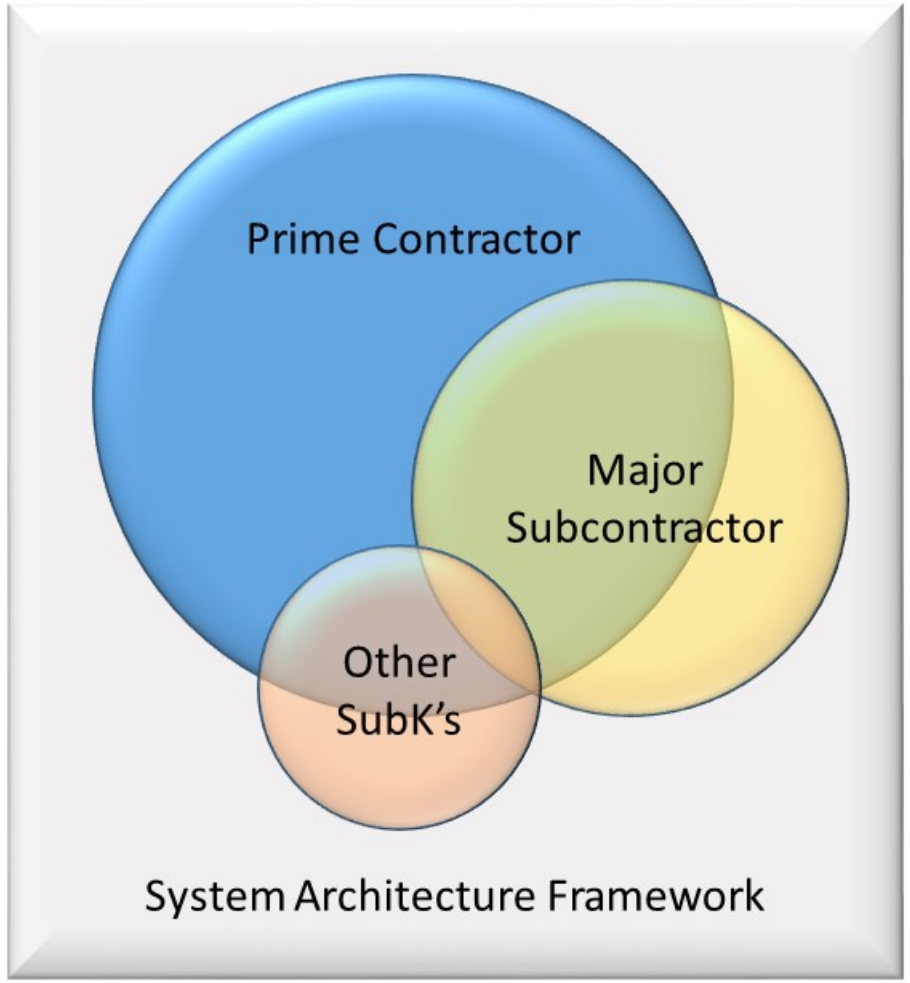


Source: www.mypurchasingcenter.com, Sen, Moumita, 2014

Introduction

- **Why is this topic important?**
  - Misuse of Earned Value Management Results in Erroneous Conclusions
  - Using simple performance indicators can lead to
    - Incomplete information of true program progress
    - Optimistic indicators can provide misinformation when predicting Prime EACs
- **What we will provide:**
  - Subcontractor EV methods available
  - Compare them and provide guidance for providing accurate assessments
  - Show what happens if other methods are integrated at the Prime level
- **Take away**
  - Show best methods that provide accurate progress at the Prime level

Introduction



- Primes use significant Subcontractor Content
- Types of Subcontracting
  - Capacity
  - Specialty
    - Labor
    - Services
    - Capability
- Attribute is correctly measuring performance

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Background

- Major Defense Acquisition Programs (MDAPS) and Major Automated Information systems (MAIS)
  - Defined by size
  - Contain Major Subcontractors
    - Have prime flow down clauses
    - Require approved systems
  - Earned Value Metrics mandated
    - Flow down to major subcontractors
    - High risk support

	Values (BY 2018)			
ACAT Level	**MDAP**	**Phase**	**MAIS**	**Phase**
ACAT I, ACAT 1A	$509M	RDT&E	$42M	All Increments
	$2.96B	Procurement	$175M	All Expenditures
			$551M	All Expenditures, Incre cycle
ACAT II	$196M	RDT&E		
	$885M	Procurement		
ACAT III	N/A	Does not meet ACAT II or Above	N/A	AIS t MAIS

Contract Value	Applicability	Notes
< $20M	EVM not required; may be applied at PM discretion based on risk to the Government	Requires business case analysis and MDA approval
>= $20M to <$100M	EVM Required; contractor is required to have an EVM system (EVMS) that complies with the guidelines in EIA-748*	The Government reserves the right to review a contractor's EVMS when deemed necessary to verify compliance
>= $100M	EVM Required; contractor is required to have an EVMS that has been determined to be in compliance with the guidelines in EIA-748*	The Contractor will provide access to all pertinent records and data requested by the Contracting Officer or duly authorized representative as necessary to permit initial and ongoing Government compliance reviews to ensure that the EVMS complies, and continues to comply, with the guidelines in EIA-748*.

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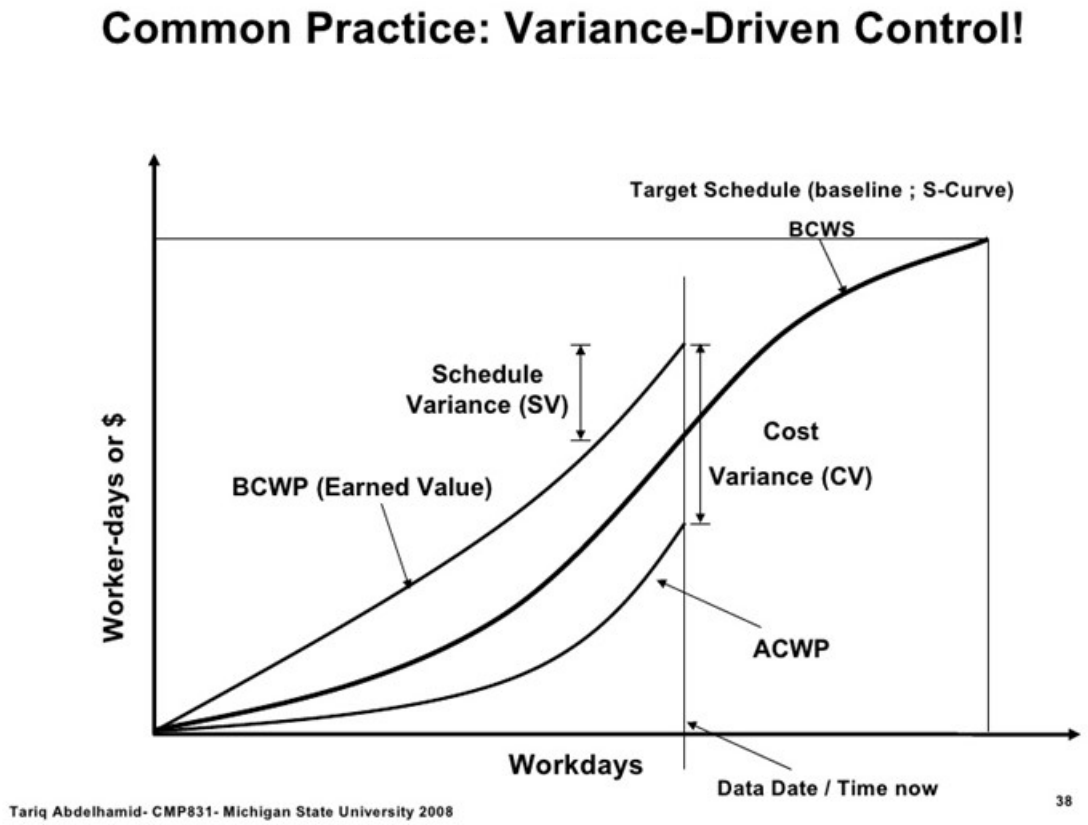
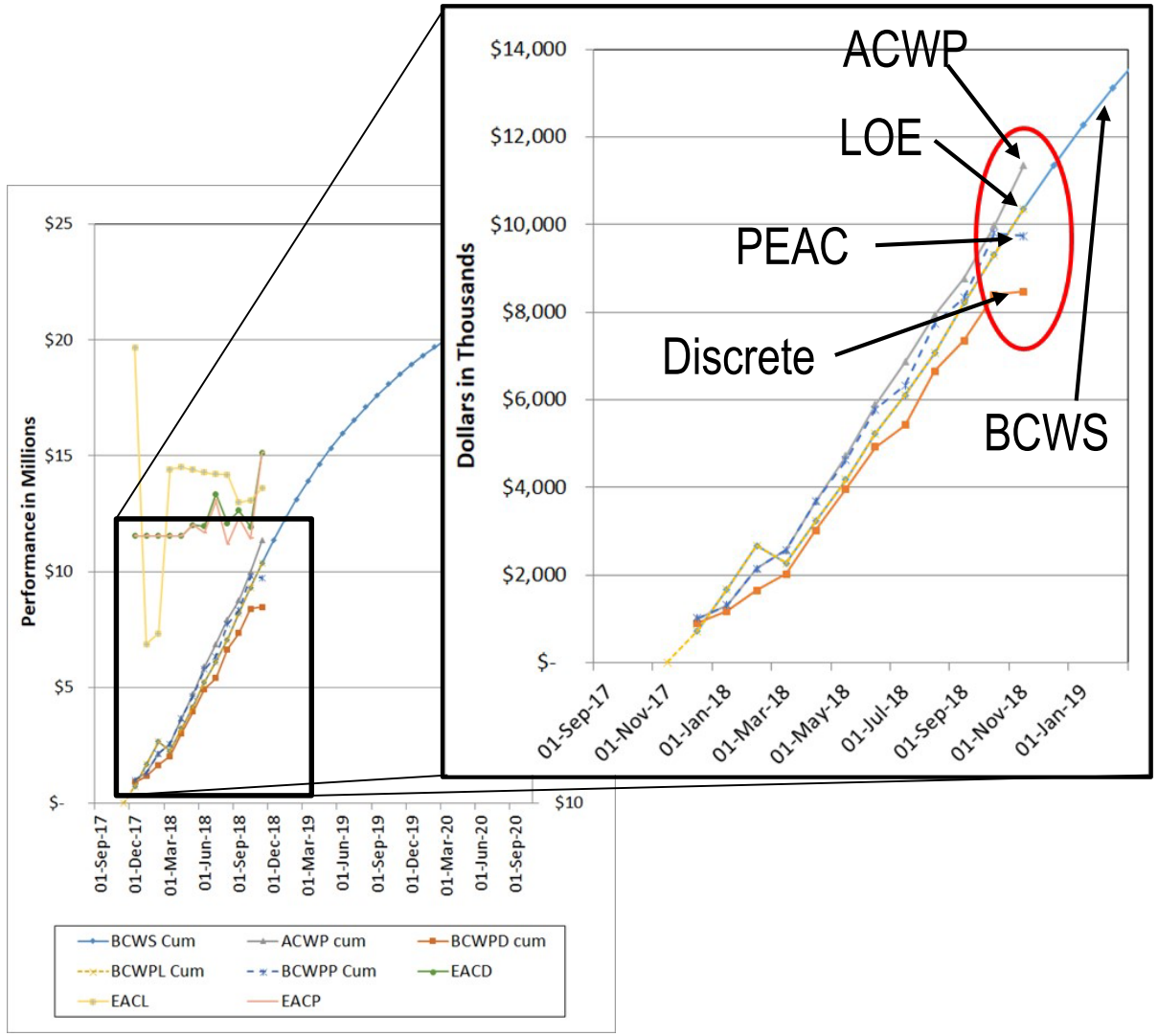


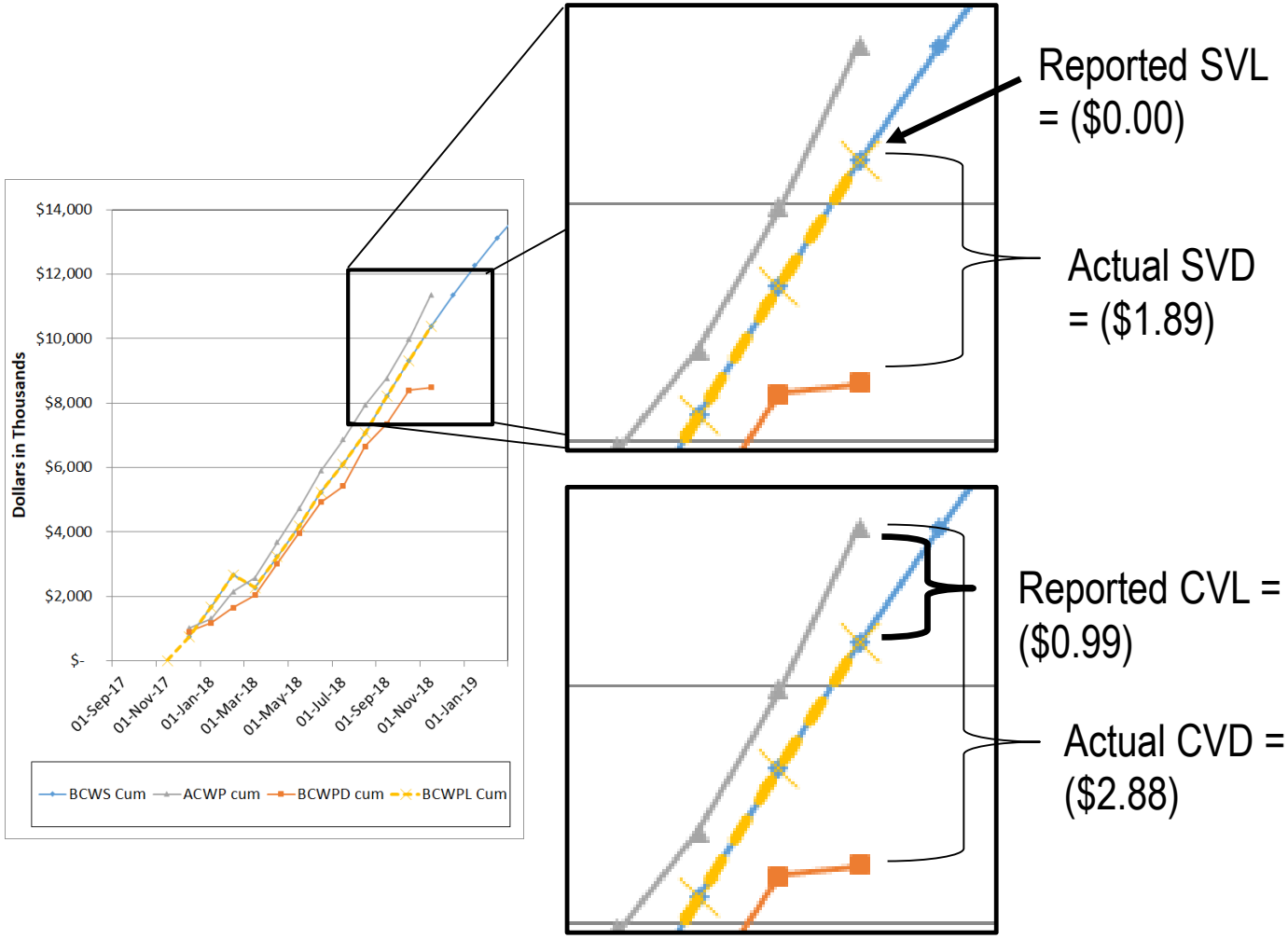
Common Practice



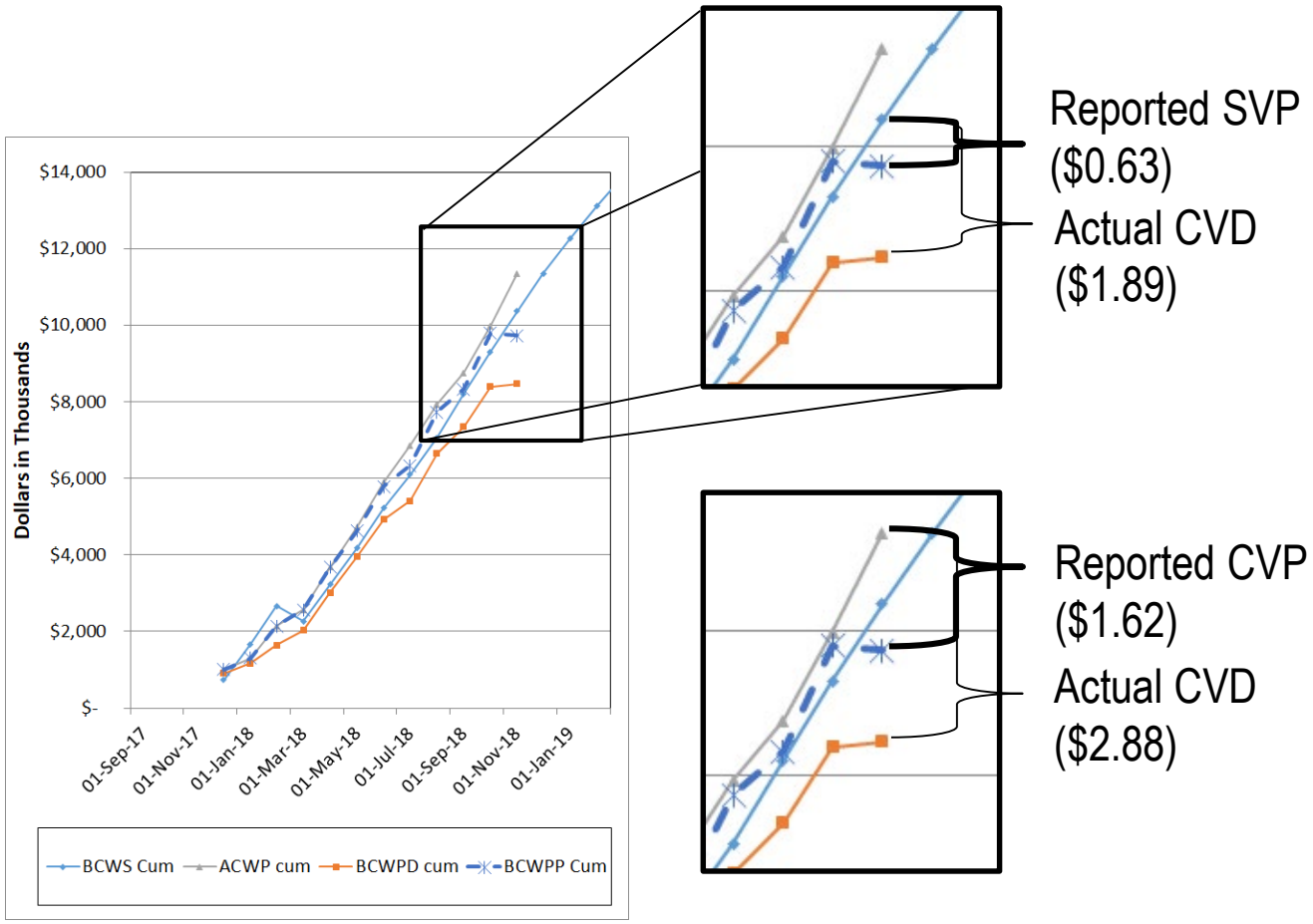
- Subcontractor performance measurements
  - Three primary methods
    - Level of Effort (LOE)
    - Percent of EAC (PEAC)
    - Discrete
  - Each have unique attributes
  - Some skew results
- Choosing appropriate method
  - Situational awareness
  - Program management tool

Level of Effort

- Attribute – no measurable output, cannot be discretely planned
- Pros (for Prime)
  - Simple to implement
  - Often used on smaller efforts
- Cons (for Prime)
  - Never shows a schedule variance
  - Shows speed of expenses not work accomplished



Percent of EAC: BCWP = (ACWP/EAC) * BAC



- Attribute – Better than LOE
  - Shows progress as a percent of EAC spent
- Pros (for Prime)
  - Shows progress based on expenses
  - Provides cost and schedule variances
- Cons (for Prime)
  - Progress only accurate if percent spend equals percent complete
  - Percent spent changes as ACWP and EAC change

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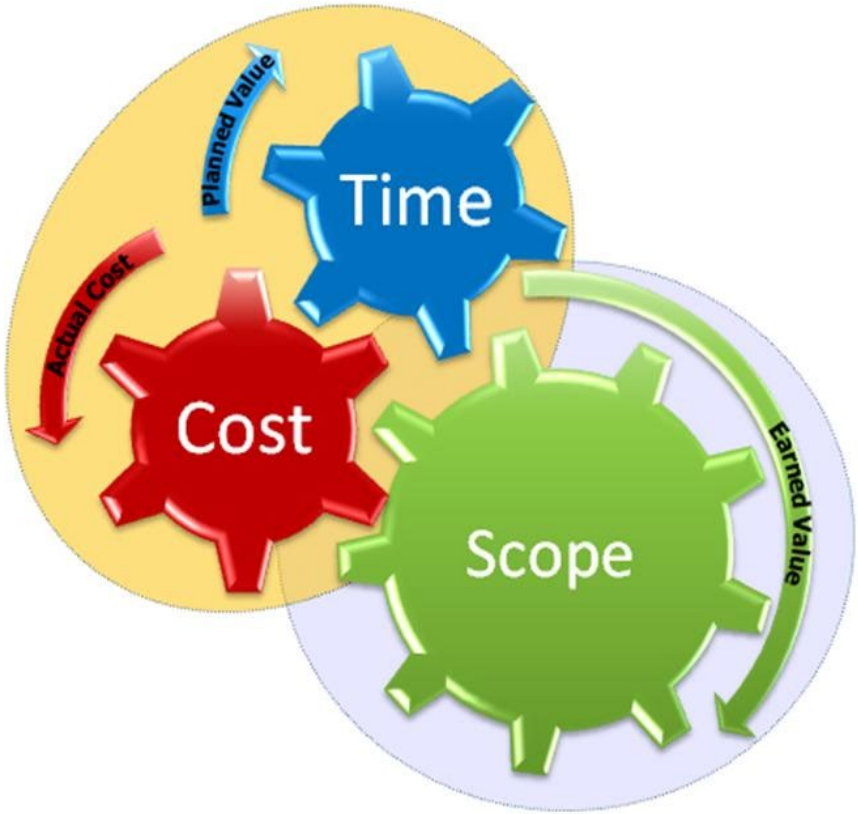
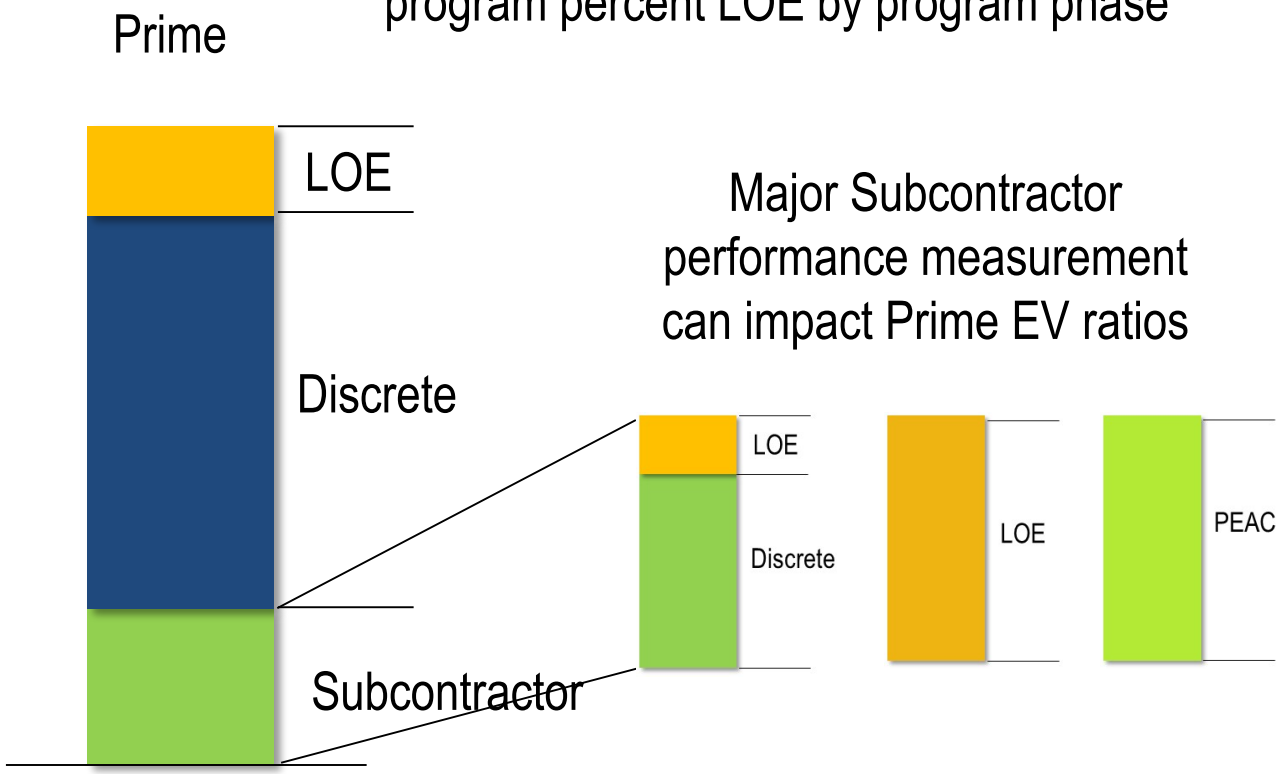


Discrete Practice

- Attributes – Multifaceted
  - Work is detail planned and resourced
  - Objective progress obtained
  - Is a DCMA best practice
- Pros (for Prime)
  - Supports integrated solution
  - Provides clear situational awareness
  - Supports forecasting
- Cons (for Prime)
  - More complex than other methods
  - Performance measurement lags by a period or more
  - Estimated actuals routine in reporting

Pre-PDR	PRE-CDR	Post-CDR
30%	20%	15%

Recommended space development program percent LOE by program phase



Major Subcontractor performance measurement can impact Prime EV ratios

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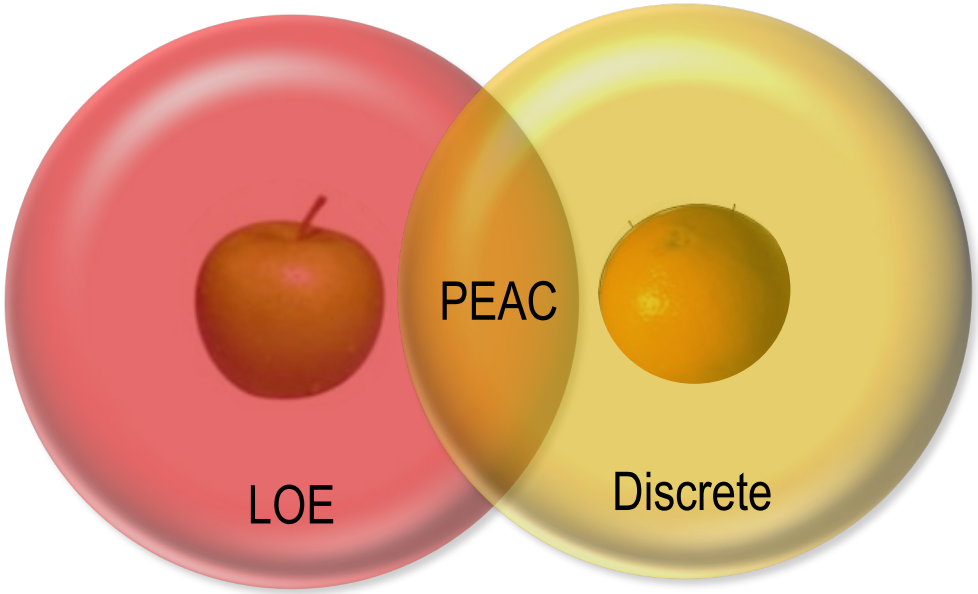
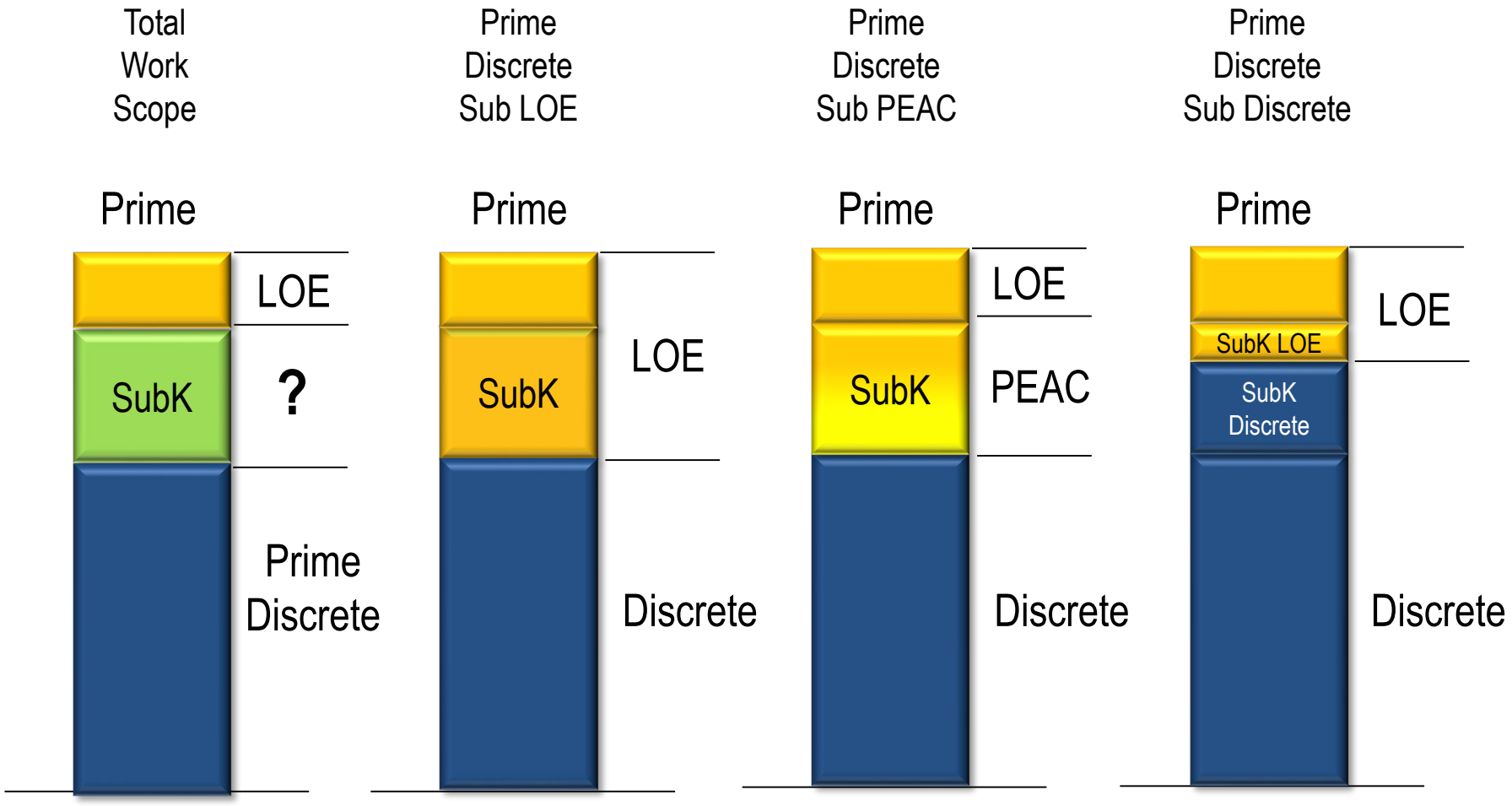


Compare and Contrast



- Major Subcontractor content can impact Prime reporting results
- LOE breaks ratios
- PEAC subjective
- Discrete – best practices

Compare and Contrast

	Performance Measurement Methods $(000)		
	Discrete	Level of Effort	Percent of EAC
BCWS	$ 10,370	$ 10,370	$ 10,370
BCWP	$ 8,477	$ 10,370	$ 9,737
ACWP	$ 11,360	$ 11,360	$ 11,360
SV	$ (1,892)	$ -	$ (633)
CV	$ (2,882)	$ (990)	$ (1,623)
SV%	-22%	0%	-6%
CV%	-28%	-10%	-16%
BAC	$ 21,540	$ 21,540	$ 21,540
SubK EAC	$ 25,130	$ 25,130	$ 25,130
VAC	$ (3,590)	$ (3,590)	$ (3,590)
% of EAC Spent	45%	45%	45%
% Complete	39%	48%	45%
CUM SPI	0.82	1.00	0.94
CUM CPI	0.75	0.91	0.86
TCPI	0.95	0.91	0.86
IEAC	$ 28,863	$ 23,596	$ 25,130
IEAC VAC	$ (7,323)	$ (2,057)	$ (3,590)

- Performance Metrics Show
  - Differences in BCWP
  - Common variance reporting impacts
  - IEAC differences
- Results drive decisions
  - Primes provide reports
  - Government assessments may differ
- Key is to be as objective and discrete as possible

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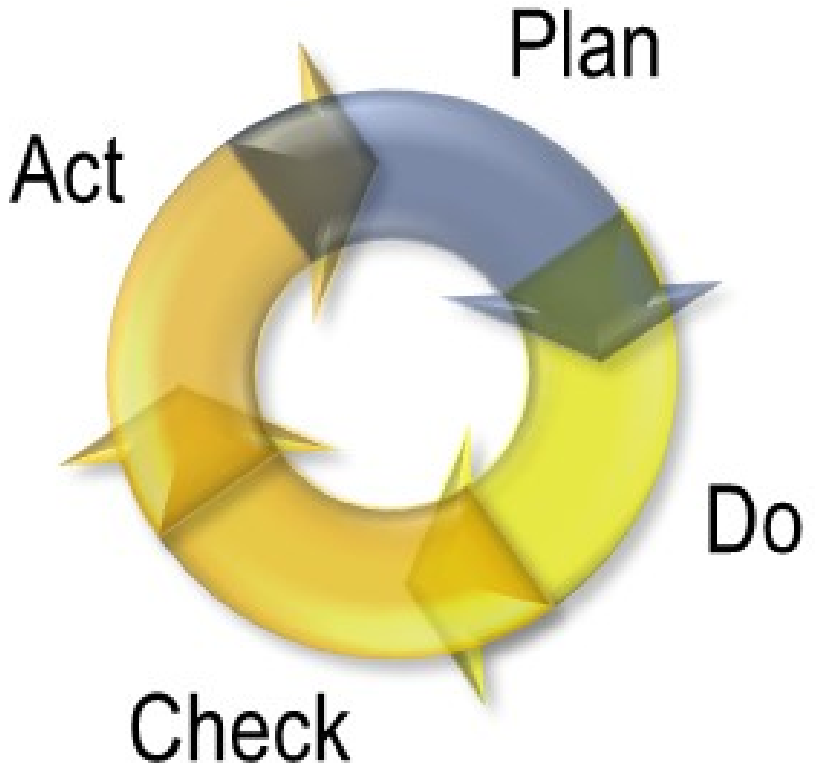
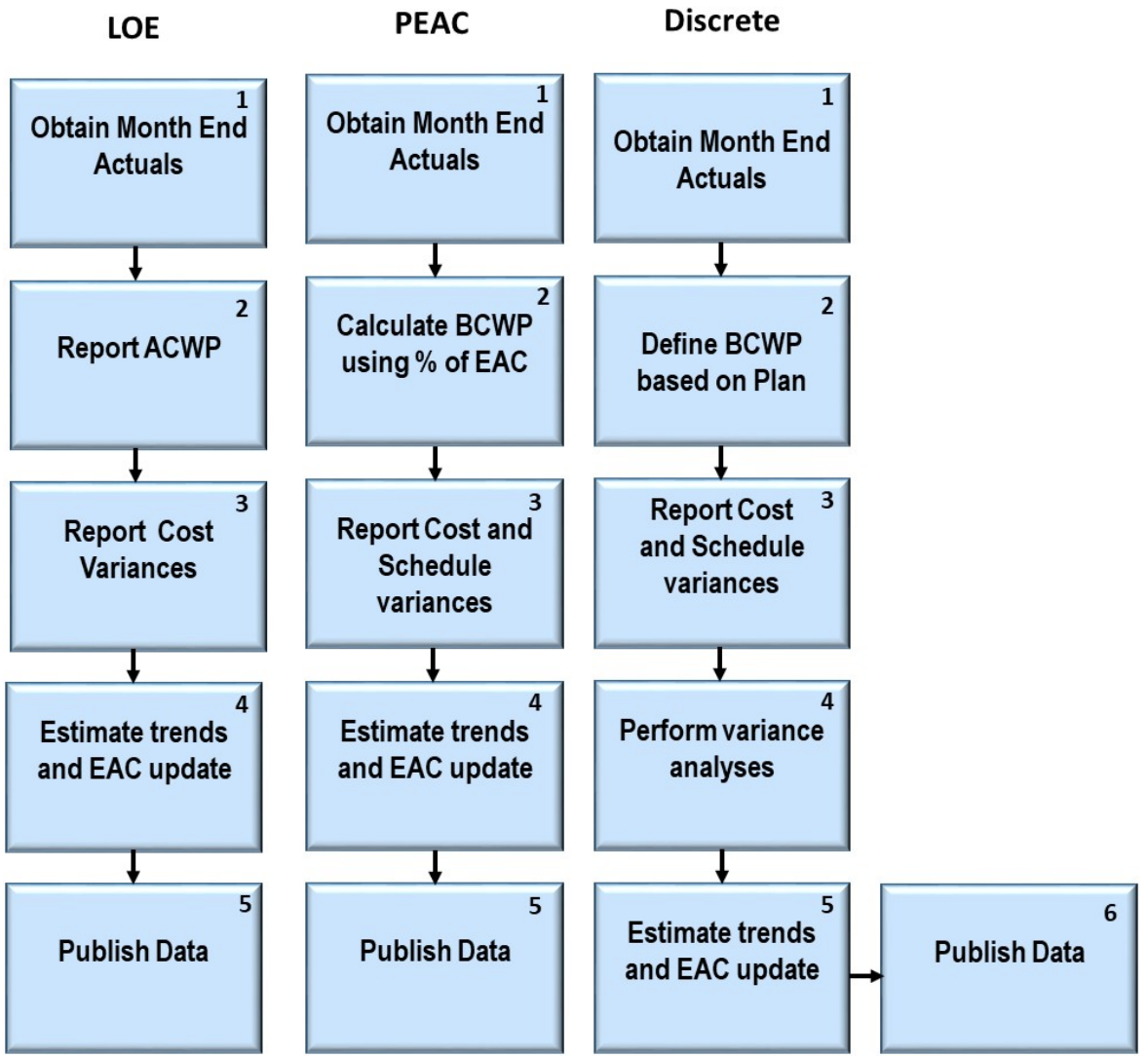


Source: Deming Quality Circle

Process

- Regardless of method
- Processes are repeatable
  - Supports data consistency
  - Transferable



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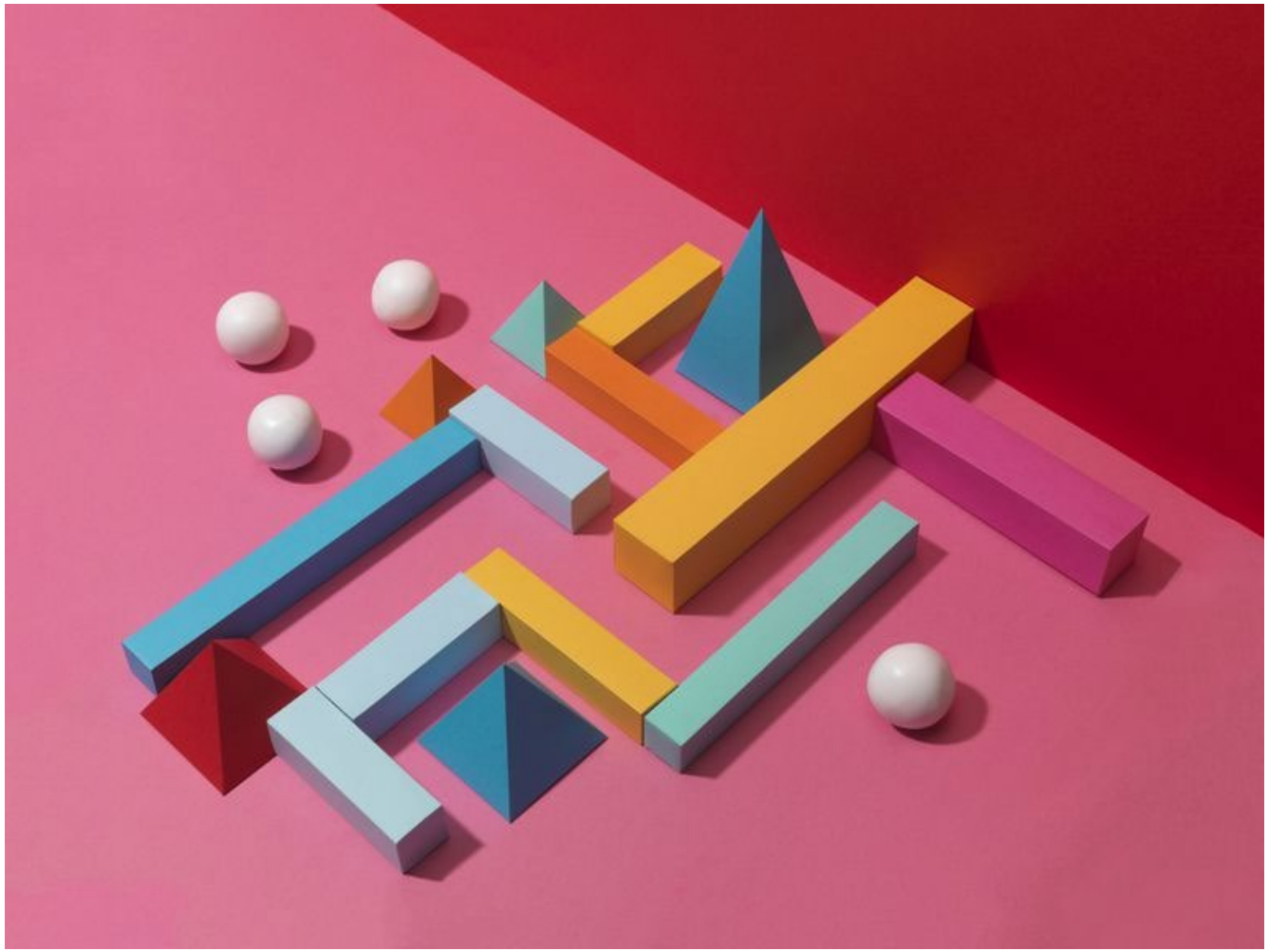


Source: ThoughtCo

Example and Analysis

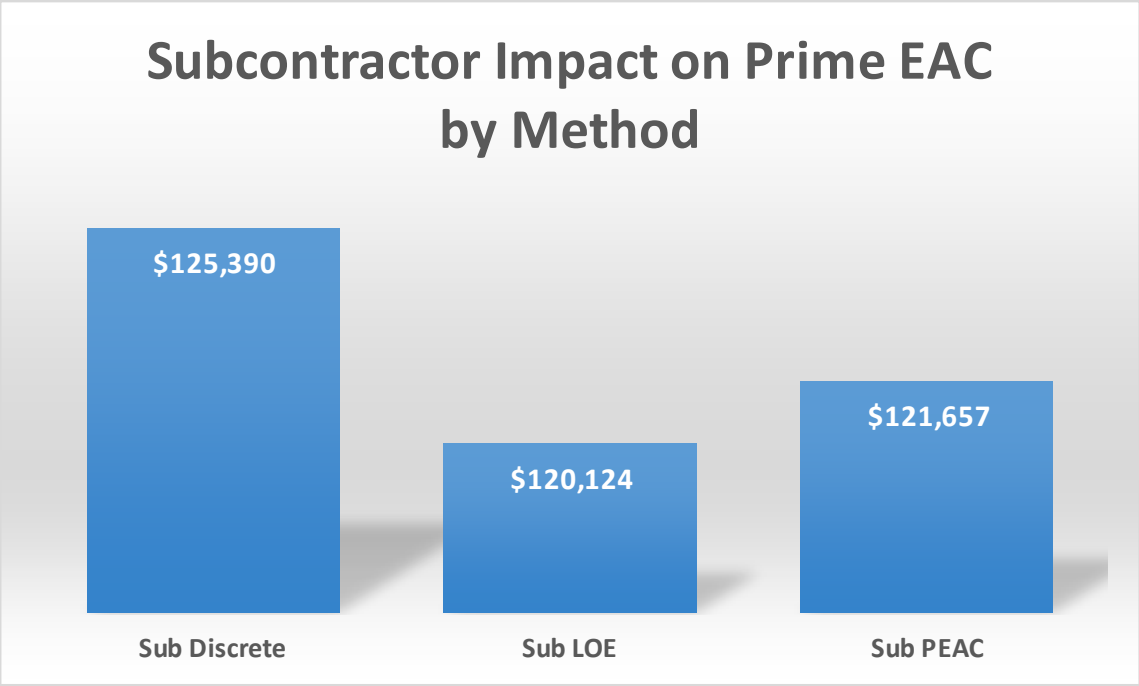
Prime Contract Impact of Subcontractor Earned Value Methods

(Thousands)	Prime/Sub Content	Sub-Contractor	Sub Percent of Total	Prime Content Only
	A	B	C	D
BAC	$ 100,000	$ 21,540	21.5%	$ 78,460
BCWS	$ 59,800	$ 10,370	17.3%	$ 49,430
ACWP	$ 55,800	$ 11,360	20.4%	$ 44,440
BCWP Discrete (d)	$ 44,600	$ 8,477	19.0%	$ 36,123
BCWP LOE (l)	$ 59,800	$ 10,370	17.3%	$ 49,430
BCWP PEAC (p)	$ 55,800	$ 9,737	17.4%	$ 46,063
SVd	$ (15,200)	$ (1,892)	12.4%	$ (13,308)
SVl	$ -	$ -	N/A	$ -
SVp	$ (4,000)	$ (633)	15.8%	$ (3,367)
CVd	$ (11,200)	$ (2,882)	25.7%	$ (8,318)
CVl	$ 4,000	$ (990)	-24.8%	$ 4,990
CVp	$ -	$ (1,623)	N/A	$ 1,623
CUM SPId	0.75	0.82		0.73
CUM SPIl	1.00	1.00		1.00
CUM SPIp	0.93	0.94		0.93
CUM CPId	0.80	0.75		0.81
CUM CPIl	1.07	0.91		1.11
CUM CPIp	1.00	0.86		1.04
IEACd	$ 125,112	$ 28,863		$ 96,527
IEACl	$ 93,311	$ 23,596		$ 70,539
IEACp	$ 100,000	$ 25,130		$ 75,696
TCPId	0.80	0.75		0.81
TCPIl	1.07	0.91		1.11
TCPIp	1.00	0.86		1.04

- Integrating Major Subcontractor data
  - Integrated solution (A)
    - Does not provide complete visibility
    - Masks Subcontractor issues
    - Under predicts likely EAC
  - Separating Prime Sub (B + D)
    - Provides visibility
    - Supports corrective actions
    - Ensures robust EAC

Example and Analysis

	Prime Discrete
Sub Discrete	$ 125,390
Sub LOE	$ 120,124
Sub PEAC	$ 121,657



- Results show
  - Decision making driven by
    - Method
    - Timeliness
    - Quality
  - Government reporting
    - Can impact Prime ratings
    - Funding obligations
    - Competitiveness

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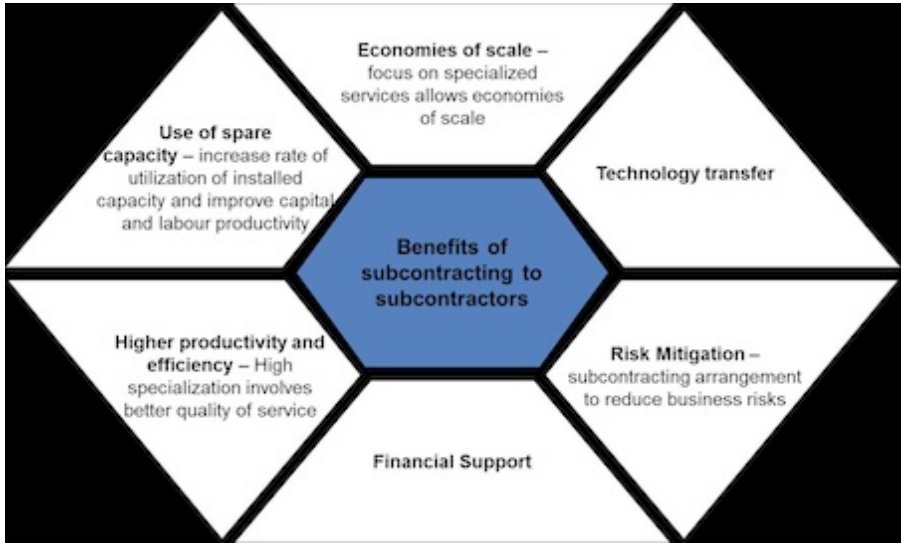
Summary

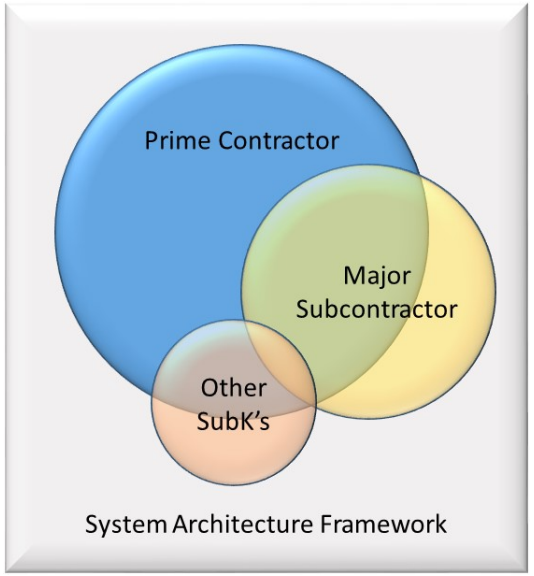
- Selecting appropriate Subcontractor performance method
  - Influences Prime decision making
  - Impacts reported performance and EAC
  - Can skew program situational awareness and corrective action
- Appropriate performance method selection depends on
  - Program Risk
  - Portion of Subcontractor work scope

	A	B	C	D	E
	Prime Integrated EAC	**Sub Separate**	Prime Separate	Integrated Total (B + C)	Delta (D - A)
Sub Discrete	$ 125,112	$ 28,863	$ 96,527	$ 125,390	$ 278
Sub LOE	$ 93,311	$ 23,596	$ 70,539	$ 94,136	$ 825
Sub PEAC	$ 100,000	$ 25,130	$ 75,696	$ 100,826	$ 826

- Prime integrated reporting under predicts EAC
- Both LOE and PEAC have EAC variances from Discrete of almost $600K
- Best practices show Discrete provides most realistic performance metrics that flow into Prime EAC



Questions



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