

A photograph of a business meeting in progress. In the foreground, a person's hands are visible, holding a tablet computer. Another person's hand is pointing at the screen. In the background, a laptop is open on a desk, and a window shows a blurred outdoor scene. The image is partially obscured by a white diagonal shape on the left side.

CONSIDERATIONS FOR FIRST-TIME EVM TOOL IMPLEMENTATIONS

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With You Today



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Agenda for Today

- ▶ Why Implement an EVM Tool?
- ▶ What Are you Implementing?
 - New Project Setup
 - Existing Projects

Why Implement an EVM Tool?



Why Implement an EVM Tool?

Compliance

- ▶ Bidding on a proposal that has EVM contractual clauses (DFARS 252.234-7001, 7002)

Other Reporting Requirements

- ▶ 533's
- ▶ CSDR

Internal Initiative

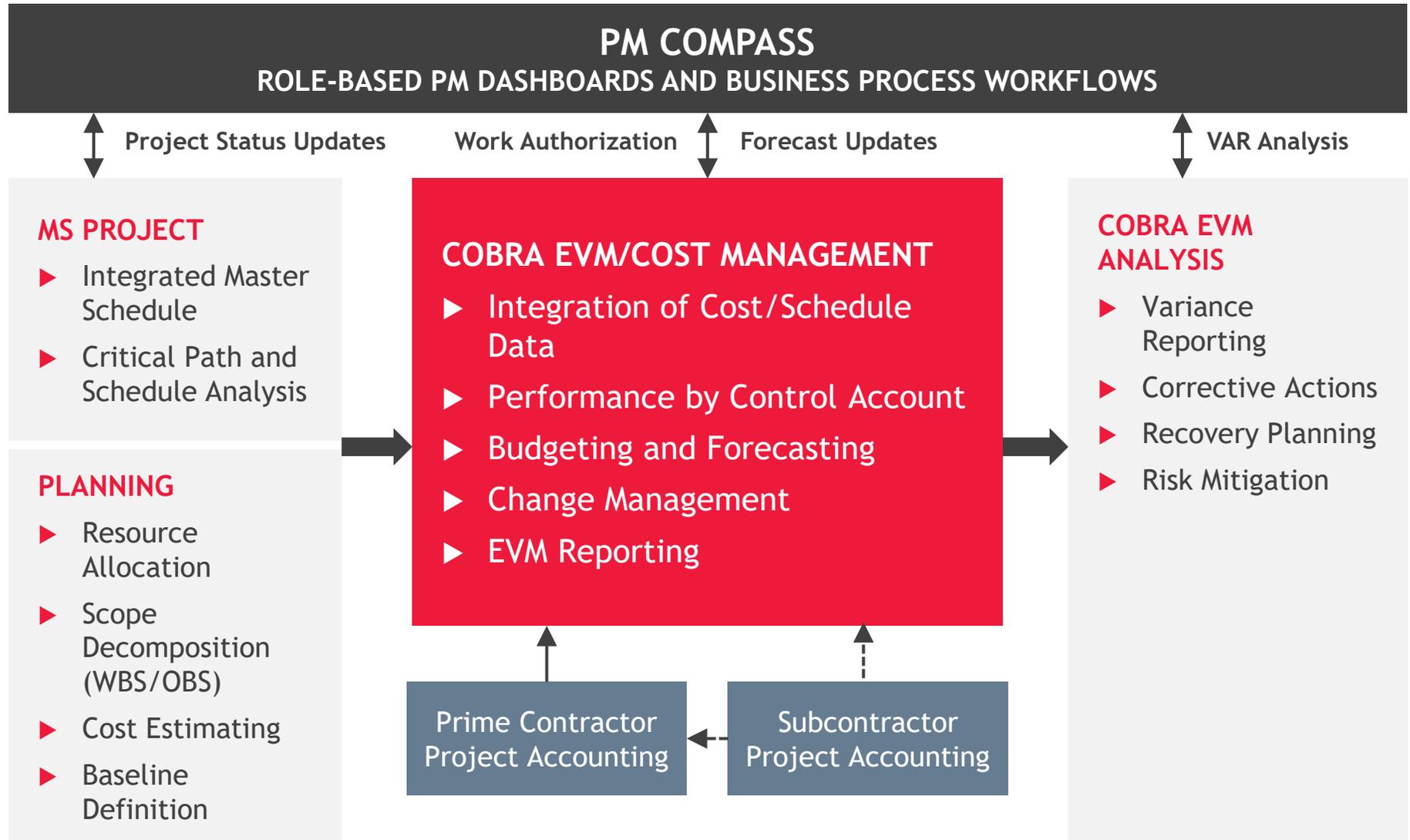
- ▶ Senior Management - EVM Lite, system robustness improvements

Legacy Tool

- ▶ Inefficiency, obsolescence
- ▶ Deltek MPM, home-grown databases, Excel

Integration With Other Tools Within Suite

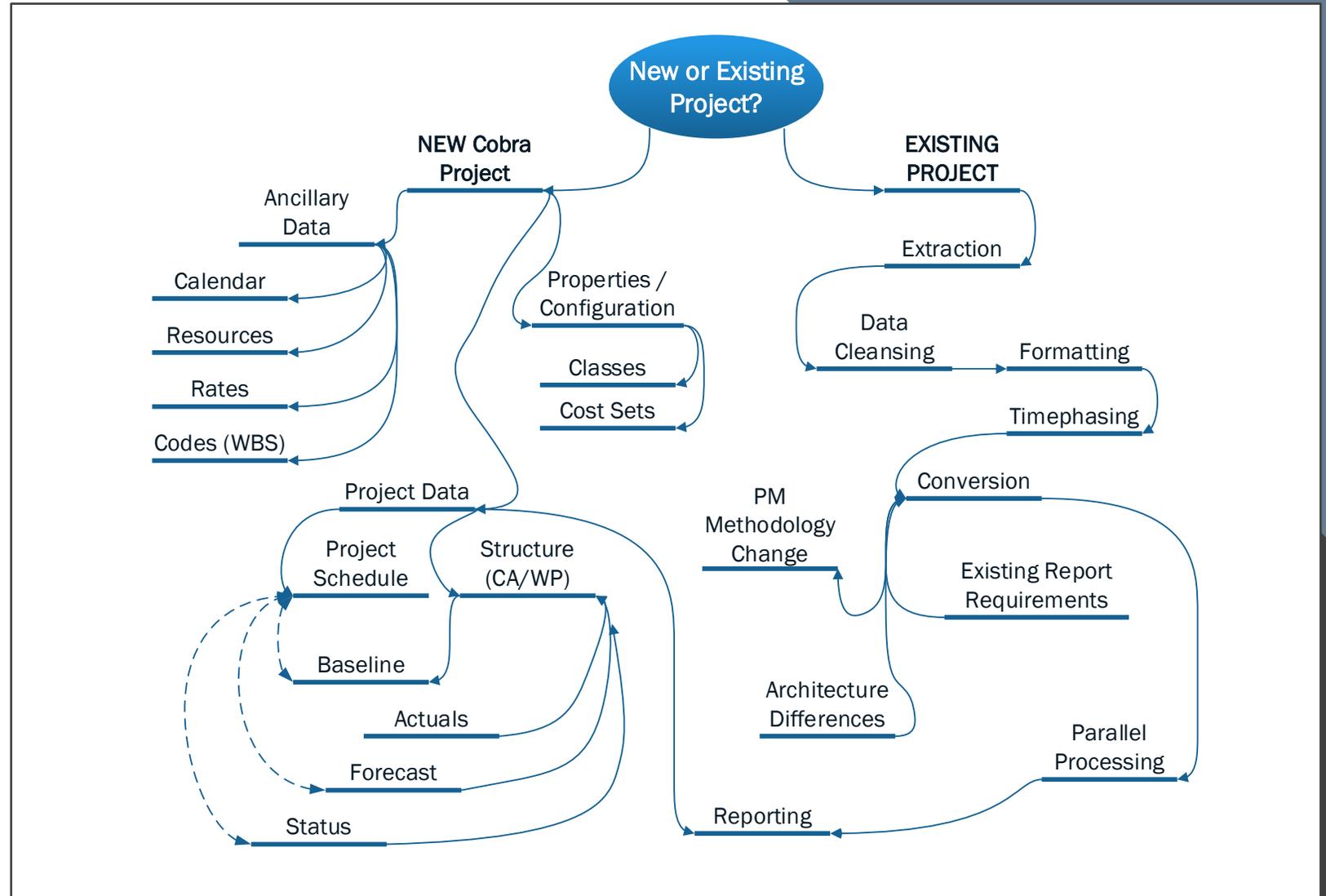
EVM/Project Controls System Architecture



Will You Be Implementing a New or Existing Project?



EVM Tool Implementation Overview



IMPLEMENTATIONS New Projects

Considerations

- ▶ What is the intent of using an EVM Tool?
 - Internal initiative
 - EVMS compliance
 - Customer Reporting
- ▶ What Existing Data do you have?
 - Internal planning, proposal, RFP / SOW, MIL Standards
- ▶ Organizational Maturity
 - Accounting, Scheduling, Forecasting



IMPLEMENTATIONS

Project Makeup

Ancillary Data

- ▶ Calendar
- ▶ Resources
- ▶ Rates
- ▶ Codes (WBS)

Project Data

- ▶ Structure
- ▶ Actual
- ▶ Baseline
- ▶ Forecast
- ▶ EVM

Properties

- ▶ Preferences
- ▶ Codes, classes
- ▶ Header info

Cobra Explorer Project - Demo Advanced X

Spreadsheet Status Date: 11/30/2015 Time-phase

	WBS	OBS	WP	Resource	Description	Baseline Start	Baseline Finish	Status	Class	Total	11/30/2015	12/31/2015	01/31/2016	02/28/2016
Total					Space Shuttle	06/01/2015	06/30/2018			4,525,876.50	185,684.67	162,757.50	172,829.76	227,711.06
	1.1.1.1	1400			Frame Design	06/01/2015	10/13/2015	Completed		236,410.64				
	1.1.1.1	1400	01		Fuselage	06/01/2015	07/12/2015	Completed		92,735.48				
	1.1.1.1	1400	01	DRAFT	Draftsmen				Actual	6,102.00	0.00			
	1.1.1.1	1400	01	MANAGE	Management				Actual	7,078.32	0.00			
	1.1.1.1	1400	01	SENG	Structural Engineers				Actual	14,060.60	0.00			
	1.1.1.1	1400	01	TECH	Technicians				Actual	7,797.00	0.00			
	1.1.1.1	1400	01	DRAFT	Draftsmen				Budget	5,429.83				
	1.1.1.1	1400	01	MANAGE	Management				Budget	5,248.84				
	1.1.1.1	1400	01	SENG	Structural Engineers				Budget	11,382.83				
	1.1.1.1	1400	01	TECH	Technicians				Budget	6,787.28				
	1.1.1.1	1400	01	DRAFT	Draftsmen				CAMs EAC	0.00				
	1.1.1.1	1400	01	MANAGE	Management				CAMs EAC	0.00				
	1.1.1.1	1400	01	SENG	Structural Engineers				CAMs EAC	0.00				
	1.1.1.1	1400	01	TECH	Technicians				CAMs EAC	0.00				
	1.1.1.1	1400	01	DRAFT	Draftsmen				Earned	5,429.83				
	1.1.1.1	1400	01	MANAGE	Management				Earned	5,248.84				
	1.1.1.1	1400	01	SENG	Structural Engineers				Earned	11,382.83				
	1.1.1.1	1400	01	TECH	Technicians				Earned	6,787.28				

General Milestones/Steps Codes Notes

Status: Completed Description: Fuselage

Dates: Start: 06/01/2015 Finish: 07/12/2015

Actual: 06/01/2015 07/12/2015

Forecast: 06/01/2015 07/12/2015

Early: 06/01/2015 07/12/2015

Late: 06/01/2015 07/12/2015

Pending: 06/01/2015 07/12/2015

Progress Technique: 50-50

Time-phase Detail

Result	Units	TOTAL	06/30/2015	07/31/2015
▶ Percent		100.00	51.16	48.84
HOURS	HOURS	160.00	81.86	78.14
FTE	HEADS	0.43	0.01	0.42
DIRECT	DOLLARS	3,712.00	1,899.15	1,812.85
FRINGE	DOLLARS	129.92	66.47	63.45
OVERHEAD	DOLLARS	576.29	294.84	281.45
G&A	DOLLARS	441.83	226.05	215.78
COM	DOLLARS	388.80	198.92	189.88
Total Currency		5,248.84	2,685.43	2,563.41

Image Source: EVM Tool

Fiscal vs. Calendar Month

What best aligns with your accounting cycle?

2021

February							
Wk	S	M	T	W	T	F	S
1	31	1	2	3	4	5	6
2	7	8	9	10	11	12	13
3	14	15	16	17	18	19	20
4	21	22	23	24	25	26	27

May							
Wk	S	M	T	W	T	F	S
14	2	3	4	5	6	7	8
15	9	10	11	12	13	14	15
16	16	17	18	19	20	21	22
17	23	24	25	26	27	28	29

August							
Wk	S	M	T	W	T	F	S
27	1	2	3	4	5	6	7
28	8	9	10	11	12	13	14
29	15	16	17	18	19	20	21
30	22	23	24	25	26	27	28

November							
Wk	S	M	T	W	T	F	S
40	31	1	2	3	4	5	6
41	7	8	9	10	11	12	13
42	14	15	16	17	18	19	20
43	21	22	23	24	25	26	27

March							
Wk	S	M	T	W	T	F	S
5	28	1	2	3	4	5	6
6	7	8	9	10	11	12	13
7	14	15	16	17	18	19	20
8	21	22	23	24	25	26	27

June							
Wk	S	M	T	W	T	F	S
18	30	31	1	2	3	4	5
19	6	7	8	9	10	11	12
20	13	14	15	16	17	18	19
21	20	21	22	23	24	25	26

September							
Wk	S	M	T	W	T	F	S
31	29	30	31	1	2	3	4
32	5	6	7	8	9	10	11
33	12	13	14	15	16	17	18
34	19	20	21	22	23	24	25

December							
Wk	S	M	T	W	T	F	S
44	28	29	30	1	2	3	4
45	5	6	7	8	9	10	11
46	12	13	14	15	16	17	18
47	19	20	21	22	23	24	25

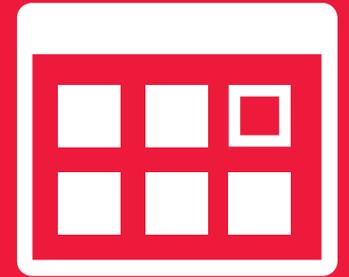
April							
Wk	S	M	T	W	T	F	S
9	28	29	30	31	1	2	3
10	4	5	6	7	8	9	10
11	11	12	13	14	15	16	17
12	18	19	20	21	22	23	24
13	24	26	27	28	29	30	1

July							
Wk	S	M	T	W	T	F	S
22	27	28	29	30	1	2	3
23	4	5	6	7	8	9	10
24	11	12	13	14	15	16	17
25	18	19	20	21	22	23	24
26	25	26	27	28	29	30	31

October							
Wk	S	M	T	W	T	F	S
35	26	27	28	29	30	1	2
36	3	4	5	6	7	8	9
37	10	11	12	13	14	15	16
38	17	18	19	20	21	22	23
39	24	25	26	27	28	29	30

January 22							
Wk	S	M	T	W	T	F	S
48	26	27	28	29	30	31	1
49	2	3	4	5	6	7	8
50	9	10	11	12	13	14	15
51	16	17	18	19	20	21	22
52	23	24	25	26	27	28	29

IMPLEMENTATIONS Calendars



IMPLEMENTATIONS Calendars

Determining Effective/Productive Hours for FTE

- ▶ Reduction in hours for holidays and average PTO / non-billable usage

The screenshot shows the 'Calendar - Demo Advanced' window in Cobra Explorer. The 'Calendar Periods' tab is selected, displaying a table with columns for 'Date' and 'Hours'. The 'Holidays' tab is also visible, showing a date selection field and an 'Add' button. The 'Automatically recalculate productive hours' checkbox is checked.

Period	Productive Hours	Productive hours Reduced for Holidays	Productive hours Reduced for Holidays and PTO
10	168	160	152.5
11	176	160	148.75
12	176	168	138

Image Source: EVM Tool

Implementations Calendars

What Are Your Reporting Requirements?

- ▶ Are you a prime or sub?
- ▶ What calendars do your subs use and how will this impact your data integration?

Example: Subk and Prime Do Not Align

- ▶ Can use accruals or timesheet data depending if the subk period ends before or after the Prime
- ▶ Use of loading ITD actuals and separate cost classes can help with reconciliation

Period	Prime Month End	SubK Month End
1	1/30/2021	1/31/2021
2	2/27/2021	2/28/2021
3	3/27/2021	3/31/2021
4	5/1/2021	4/30/2021
5	5/29/2021	5/31/2021
6	6/26/2021	6/30/2021
7	7/31/2021	7/31/2021
8	8/28/2021	8/31/2021

IMPLEMENTATIONS

Resources

Resource File

- ▶ Hierarchical structure of resources by category and resource type where each level is broken down until it is small enough to be used in conjunction with the WBS to plan work
- ▶ Also contains calculations for cost buildup

Considerations When Creating the RBS:

- ▶ Parents / Groupings
- ▶ Elements of Cost (i.e., Labor, ODC)
- ▶ Burden Pools (similar buildups for ease of maintenance)

	Resource	Description
[-]	Example RBS	Company Level
[-]	LABOR	Labor
[-]	ENGINEER	Engineering
▶	ASTRO	Astronomers
	CHEMENG	Chemical Engineer
	DRAFT	Draftsmen
	EENG	Electrical Engineers
	ERGENG	Ergonomic Engineers
	MANAGE	Management
	SENG	Structural Engineers
	SYSAN	Systems Analysis
	TECH	Technicians
	MANUFAC	Manufacturing
	QUALITY	Quality Control
[-]	ODC	Other Direct Costs
	CONSULT	Consultants
[-]	RELOC	Relocation
	NEWCODE	
	TRVL	Travel
[-]	MATL	Material
	SUB1	Subcontract for part #233
	SUB2	Subcontract for part #4857

Image Source: EVM Tool

IMPLEMENTATIONS

Resources

Considerations When Creating the RBS (cont.)

- ▶ Labor Category vs Named Resource
 - Labor category levels vs blended
 - Using both for different classes
 - Matching accounting
- ▶ How to include subcontractor resources
 - Company
 - Element of Cost
 - Vendor Employee ID (if in timesheet system)
- ▶ Whether Accruals require additional resources or use existing

Resource	Parent
Systems Engineering	Engineering
Sys Engineer IV	Systems Engineering
Sys Engineer III	Systems Engineering
Sys Engineer II	Systems Engineering

Resource	Parent
Systems Engineer	Engineering
Electrical Engineer	Engineering
Developer	Engineering

Resource	Parent
Actuals	RBS
Ameen, Bob	Engineering
Johnikin, Kelsey	Engineering

Period	Resource	Accrued Amount
9/30/2021	Systems Engineer	\$1,000.00
9/30/2021	Project Control	\$400.00

Period	Resource	Accrued Amount
9/30/2021	Labor Accrual	\$1,400.00

IMPLEMENTATIONS

Rates

Direct Rates

- ▶ Proposed Rates
- ▶ Generic rates based on benchmark data
- ▶ Blended actual rates

Indirect Rates

- ▶ Target rates
- ▶ Actuals
- ▶ Reconciliation of indirect rates

Escalation

- ▶ Determining rate and where it is applied

WBS	BOE	Resource	Rate	Hours
1.1.1	12	Cyber Engineer IV	\$175.00	240.0
1.1.1	12	Cyber Engineer III	\$155.00	240.0

Name	Labor Category	Hourly
Employee 1	Sys Engineer IV	65.00
Employee 2	Sys Engineer III	57.00
Employee 3	Sys Engineer II	62.00
Employee 4	Systems Engineer	48.00
Employee 5	Systems Engineer	77.00
Employee 6	Sys Engineer V	95.00
Blended: Systems Engineer:		67.33

OH	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	20%
Period	1	2	3	4	5	6	7	8	9	10	11	12
Direct	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000
OH	\$300	\$300	\$300	\$300	\$300	\$300	\$300	\$300	\$300	\$300	\$300	\$200
adjustment												-\$1,100

IMPLEMENTATIONS

Rates

Cobra Rate Requirements

- ▶ Rate Set Name
- ▶ Rate Value and Effective Date
- ▶ All Direct and Indirect Rates in same file

The screenshot shows the Cobra Explorer interface with the 'Rates - Demo Advance Rate' window open. The window is divided into two main sections: a list of Rate Sets and a table of Rate Values.

Rate Set	Description	Date	Value
▶ ASTRO	Astronomer	▶ 01/01/2015	22.000000
CHEM	Chemical Engineer	01/01/2016	24.200000
COM	Cost of Money	01/01/2017	26.620000
DRAFT	Draftsman	01/01/2018	29.282000
EENG	Electrial Engineer	01/01/2019	32.210200
ERGOENG	Ergonomics Engineer		
FRINGE	Fringe benefit rate		
GANDA	General and Administrative Rate		
MANAG	Management		
MONTHS	Staff Month (heads) rate		
OVERHEAD	Overhead		
SENG	Structural Engineer		
SYSAN	Systems Analyst		
TECH	Technician		

Below the table is a 'Details' section with the following information:

Rate Set:

Description:

Image Source: EVM Tool

IMPLEMENTATIONS Calculations

Relationship to Resources and Rate Files

- ▶ Rate File Contains the Rate sets and Rate table values that are used in the actual Resource Calculation.
- ▶ The resource file contains the calculation and based on the Rate File selected will determine the values used in Cobra to calculate to total dollars.
- ▶ Ensure that Cobra calculations match how your accounting system loads costs based on Pools, etc.

Rate Set	Description	Date	Value
10%	10%	01/01/2009	25.000000
20%	20%	04/01/2009	26.000000
4.5%	4.5%	01/15/2010	27.500000
E_RATE	Hourly Rate for Engineers		
QA_RATE	General and Administrative Burden		
IT_Rate	Hourly Rate for IT Support		
OH_RATE	Overhead Burden		
QA_RATE	QA Rates		
T1_RATE	Hourly Rate for Tech (Class I)		

Project Rate File

Resource	Description
LABOR	Labor Costs
ENG	Engineer
TECH	Technician (Class I)
TECH2	Technician (Class II)
IT	IT Support
QA	Quality Assurance
MS	Material and Subcontract Costs
MAT	Material Costs
SUB	Subcontracting Costs
ODC	Other Direct Costs
TRVL	Travel Costs
CONLAB	Contract Labor Costs
Freight	Freight and Shipping Costs
Tax	Taxes

Field Name	Result	Units	Rate Set	Currency	Result Code
DIRECT	DIRECT	DOLLARS	E_RATE		D - Direct
OVERHEAD	OVERHEAD	DOLLARS	OH_RATE		D - Overhead

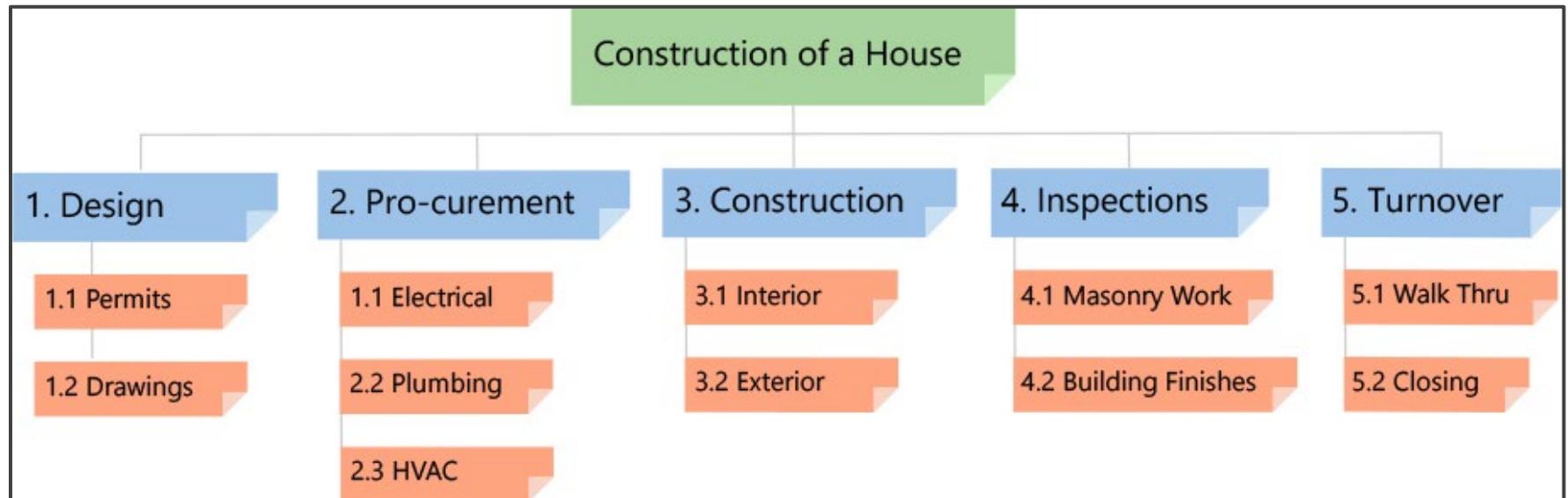
Project Resource File

Image Source: EVM Tool

WBS

- ▶ Product oriented
- ▶ Includes all work
- ▶ Should be decomposed to include sufficient level of detail
- ▶ The lowest level doesn't have to be consistent

IMPLEMENTATIONS Codes



IMPLEMENTATIONS

Codes

How to Structure the WBS Numbering Convention?

- ▶ **Punctuated Significant:** A parent/child relationship is defined by a character (e.g., Period) that separates each level in the structure
- ▶ **Non-Significant:** The parent/child relationship is not apparent by reading the code. A parent column may be added to the transfer file to define a hierarchy
- ▶ **Fixed Form Significant:** The parent/child relationship is defined but no punctuation is necessary. The users specify the number of levels and number of characters at each level in the wizard

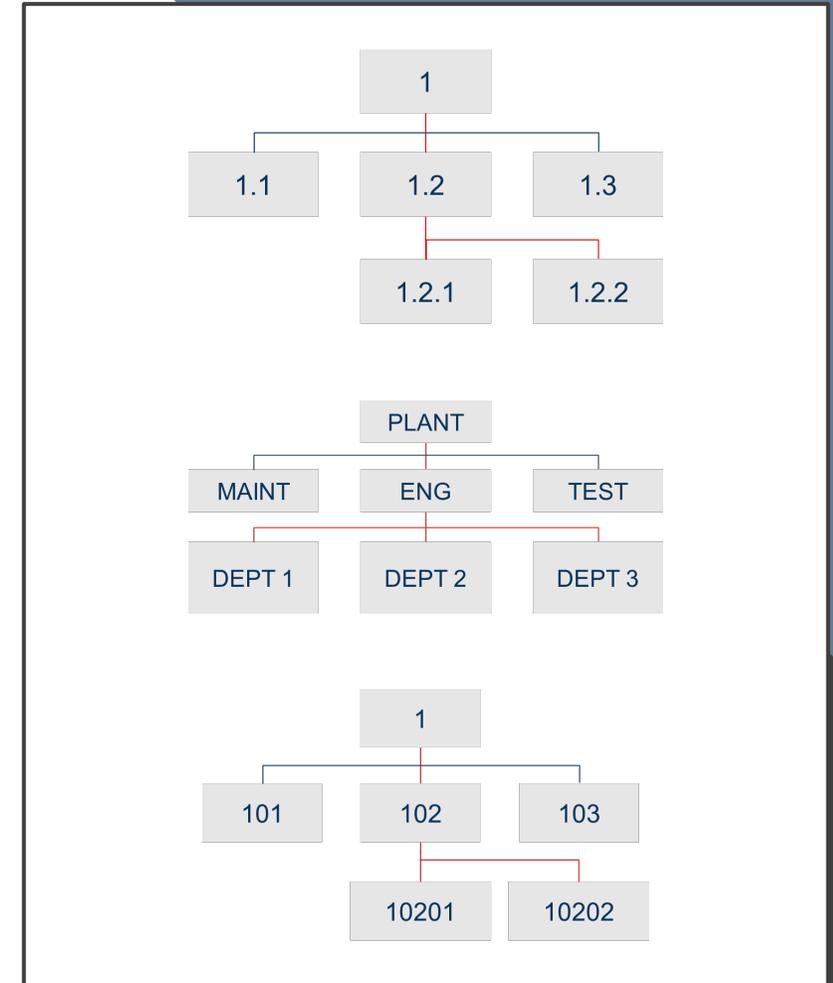


Image Source: Deltek Cobra

IMPLEMENTATIONS

Codes

WBS Considerations

- ▶ Given a CWBS or Mil Standard to use?
- ▶ What is a sufficient level for this project?
- ▶ Understanding the scope to define it within the WBS (create a WBS Dictionary)

WBS #	Level 1	Level 2	Level 3	Level 4
1.0	Electronics/Avionics/Generic Systems			
1.1	Prime Mission Product (PMP) 1...n (Specify)			
1.1.1		PMP Integration, Assembly, Test, and Checkout		
1.1.2		PMP Subsystem 1...n (Specify)		
1.1.2.1			Subsystem Integration, Assembly, Test, and Checkout	
1.1.2.2			Subsystem Hardware 1...n (Specify)	
1.1.2.3			Subsystem Software Release 1...n (Specify)	
1.1.3		PMP Software Release 1...n (Specify)		
1.1.3.1			Computer Software Configuration Item (CSCI) 1...n (Specify)	
1.1.3.2			PMP Software Integration, Assembly, Test, and Checkout	
1.2	Platform Integration, Assembly, Test, and Checkout			
1.3	Systems Engineering			
1.3.1		Software Systems Engineering		
1.3.2		Integrated Logistics Support (ILS) Systems Engineering		
1.3.3		Cybersecurity Systems Engineering		
1.3.4		Core Systems Engineering		
1.3.5		Other Systems Engineering 1...n (Specify)		
1.4	Program Management			
1.4.1		Software Program Management		
1.4.2		Integrated Logistics Support (ILS) Program Management		
1.4.3		Cybersecurity Management		
1.4.4		Core Program Management		
1.4.5		Other Program Management 1...n (Specify)		
1.5	System Test and Evaluation			
1.5.1		Developmental Test and Evaluation		
1.5.1.1			Engineering Development Test	
1.5.1.2			System Qualification Test	
1.5.1.3			Cybersecurity Test and Evaluation	
1.5.1.4			Other DT&E Tests 1...n (Specify)	
1.5.2		Operational Test and Evaluation		
1.5.2.1			Cybersecurity Test and Evaluation	
1.5.2.2			Other OT&E Tests 1...n (Specify)	
1.5.3		Live Fire Test and Evaluation		
1.5.4		Mock-ups/System Integration Labs (SILs)		
1.5.5		Test and Evaluation Support		
1.5.6		Test Facilities		
1.6	Training			
1.6.1		Equipment		
1.6.1.1			Operator Instructional Equipment	
1.6.1.2			Maintainer Instructional Equipment	
1.6.2		Services		
1.6.2.1			Operator Instructional Services	
1.6.2.2			Maintainer Instructional Services	
1.6.3		Facilities		
1.6.4		Training Software 1...n (Specify)		
1.7	Data			
1.7.1		Data Deliverables 1...n (Specify)		

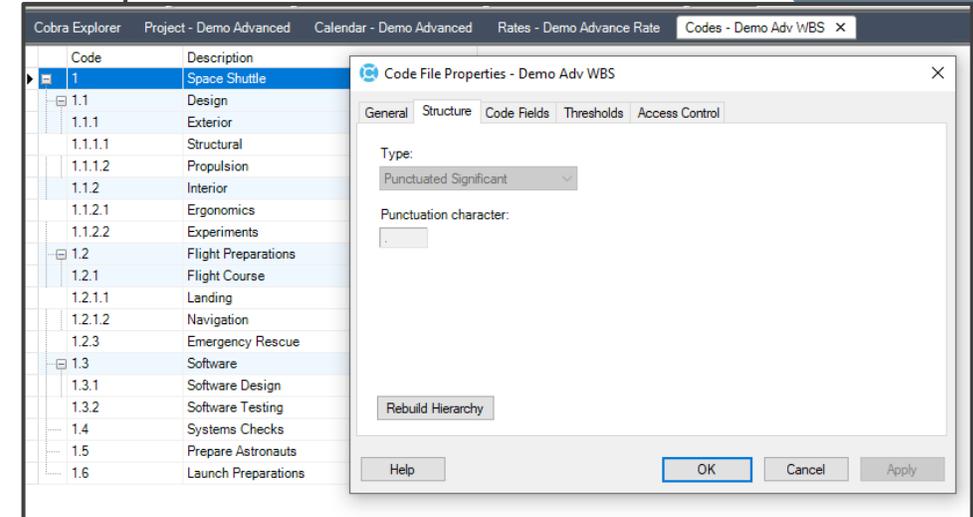


Image Source: EVM Tool

Control Accounts and Work Packages

- ▶ Cobra allows for up to 3 CA defining fields
- ▶ Almost always WBS, typically OBS used also

The screenshot displays the Cobra Explorer interface. On the left, a spreadsheet titled 'preadsheet' shows a hierarchy of control accounts. The columns are WBS, OBS, and WP. A 'Total' row is highlighted in yellow. Below it, several rows show a WBS code of '1.1.1.1', an OBS value of '1400', and a WP value of '01'. One of these rows is highlighted in blue. On the right, the 'Project Properties - Demo Advanced' dialog box is open, showing the 'Fields' tab. The 'Project' field is set to 'Demo Advanced'. The 'Control Account Field 1' is 'WBS', 'Control Account Field 2' is 'OBS', and 'Control Account Field 3' is empty. The 'Work Package Field' is 'WP'. The 'Code File' field is 'Demo Adv WBS', and the 'Code Field Type' is 'Code (optional)'. The 'Change Number' is '<none>'. The 'CAM' field is 'Manager'.

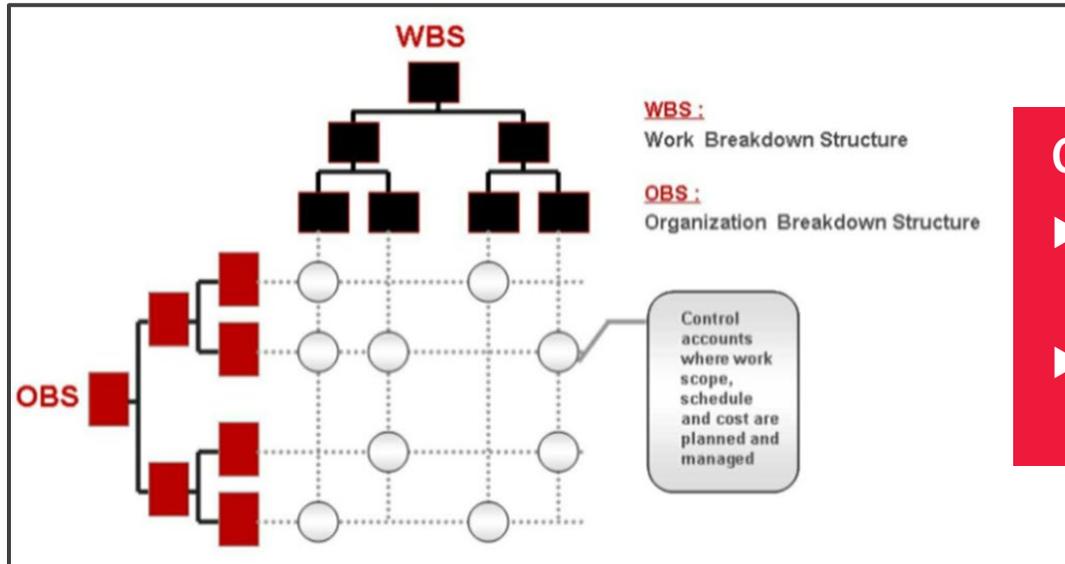
	WBS	OBS	WP
Total			
1.1.1.1	1.1.1.1	1400	
1.1.1.1	1.1.1.1	1400	01
1.1.1.1	1.1.1.1	1400	01
1.1.1.1	1.1.1.1	1400	01
1.1.1.1	1.1.1.1	1400	01
1.1.1.1	1.1.1.1	1400	01
1.1.1.1	1.1.1.1	1400	01
1.1.1.1	1.1.1.1	1400	01
1.1.1.1	1.1.1.1	1400	01
1.1.1.1	1.1.1.1	1400	01
1.1.1.1	1.1.1.1	1400	01
1.1.1.1	1.1.1.1	1400	01
1.1.1.1	1.1.1.1	1400	01
1.1.1.1	1.1.1.1	1400	01
1.1.1.1	1.1.1.1	1400	01
1.1.1.1	1.1.1.1	1400	01

IMPLEMENTATIONS Project Structure

Image Source: EVM Tool

Control Accounts and Work Packages

- ▶ The level where scope, schedule, and cost should be managed
- ▶ If established too low, work packages don't provide much added value
- ▶ If established too high, there is decrease visibility to work scope
- ▶ Often just a level of the WBS



Other Considerations

- ▶ Mixing large material purchases with labor
- ▶ Overall dollar value assigned to CAMs in the RAM

Image Source:
<https://images.app.goo.gl/HR7pb8crLtP5Sedg7>

IMPLEMENTATIONS

Project Structure

IMPLEMENTATIONS

Work Packages

Work Packages

- ▶ Subdivision of a Control Account
- ▶ Place where work is planned, progress is measured, and earned value calculated
- ▶ Is clearly distinguished from other work with its own clearly defined scope
- ▶ Has start and finish dates
- ▶ Actuals can be recorded at this level (if not at the Control Account)

Considerations

- ▶ Durations and size
- ▶ Mixing LOE with discrete work
- ▶ Mixing large material purchases with labor
- ▶ Cobra has many Progress Techniques available (EVTs)

The screenshot displays the Cobra Explorer interface for a project named 'Project - Demo Advanced'. It shows a spreadsheet view of work packages and a detailed view of a specific milestone.

Spreadsheet View:

	WBS	OBS	WP	Resource	Description	Progress
Total					Space Shuttle	
	1.1.1.1	1400			Frame Design	
	1.1.1.1	1400	01		Fuselage	50-50
	1.1.1.1	1400	02		Wing Design	Milestones
	1.1.1.1	1400	03		Heat Shield Design	User Defined
	1.2.3	1000			Emergency Rescue	

Milestone/Steps View:

Status: Completed
Description: Wing Design

Dates:

	Start	Finish
Baseline:	06/01/2015	10/13/2015
Actual:	06/01/2015	10/13/2015
Forecast:	06/01/2015	10/13/2015
Early:	06/01/2015	10/13/2015
Late:	06/01/2015	10/13/2015
Pending:	06/01/2015	10/13/2015

Progress Technique: Milestones

Milestone/Steps Table:

Name	Description	Baseline Finish	Actual Finish	Forecast Finish	Status	Weight
PHASE1	Structure Design	06/15/2015	06/15/2015	06/15/2015	Completed	9
PHASE2	Material Design	07/15/2015	07/15/2015	07/15/2015	Completed	21
PHASE3	Wiring Design	10/13/2015	10/13/2015	10/13/2015	Completed	70

Image Source: EVM Tool

IMPLEMENTATIONS

Scheduling

Developing an IMS

- ▶ Start with High level schedule / Major milestones or standard WBS
- ▶ Decompose further into manageable activities

Are Levels Defined in the IMS?

- ▶ Control Account
- ▶ Work Package
- ▶ Milestone or Task
- ▶ Schedule Visibility Tasks (SVT)

	*CA	*WP	*EVT	*CWBS	Name	% Work Complete	Duration	Predecessors
1					Sample System IMS	99%	2522 d	
2					Program Milestones	0%	2462 d	
94					Government/Customer Furnished (GFE/CFE)	0%	1538 d	
286					Inter-Divisional Dependencies	100%	882 d	
301				1.1.4.01	System	99%	2462 d	
302				1.1.4.01.01	Prime Mission Product	99%	2462 d	
303				1.1.4.01.01.01	Engineering Control System (ECS)	100%	2462 d	
304	44			1.1.4.01.01.01	ECS HW	100%	2462 d	
305	44	14382		1.1.4.01.01.01	Console Design	100%	378 d	
306	44	14382	MWPC	1.1.4.01.01.01	Prepare Preliminary Drawings of console structure	100%	34 d	15
307	44	14382	MWPC	1.1.4.01.01.01	Conduct Console Finite Element Analysis (FEA)	100%	82 d	15,1476
308	44	14382	MWPC	1.1.4.01.01.01	Prepare Final detail drawings of console structure	100%	69 d	1476,15
309	44	14382	MWPC	1.1.4.01.01.01	Produce 3D models of console structure	100%	5 d	1476,15
310	44	14382	MWPC	1.1.4.01.01.01	Command Module Console Framework Build	100%	189 d	1556,15
311	44	45		1.1.4.01.01.01	ECS HW Preliminary Design	100%	2116 d	
312	44	45	MWPC	1.1.4.01.01.01	Perform ECS HW Preliminary Design Engineering	100%	20 d	19,170
313	44	45	MWPC	1.1.4.01.01.01	Conduct ECS HW Preliminary Information Assurance Review of Design	100%	1 d	312
314	44	45	MWPC	1.1.4.01.01.01	Perform Trade Studies and Prepare ECS HW PDR Purchase Technical Specifications	100%	22 d	19
315	44	45	MWPC	1.1.4.01.01.01	Prepare ECS HW PDR Preliminary Drawings/Sketches	100%	100 d	4
316	44	50		1.1.4.01.01.01	ECS HW Detail Design	100%	623 d	
317	44	50	MWPC	1.1.4.01.01.01	Perform ECS HW Detail Design Engineering	100%	262.5 d	164FF,165FF
318	44	50	MWPC	1.1.4.01.01.01	Update ECS HW CDR Craft Systems Drawing	100%	97 d	20
319	44	50	MWPC	1.1.4.01.01.01	RESTART: Update ECS HW CDR Craft Systems Drawing	100%	26 d	13,318,15
320	44	53		1.1.4.01.01.01	ECS HW CDR Block Diagrams	100%	312 d	
321	44	53	MWPC	1.1.4.01.01.01	Prepare ECS HW Block Diagrams - DAUs (F.3)	100%	2 d	103,105
322	44	53	MWPC	1.1.4.01.01.01	Review, Comment, Adjudicate TM&LS Data - Battle Override ICD	100%	2 d	112
323	44	53	MWPC	1.1.4.01.01.01	Prepare ECS HW Block Diagrams - Battle Override Panel	100%	45 d	105,322FF

Image Source: EVM Tool

IMPLEMENTATIONS

Scheduling

Resource Loaded Schedule

- ▶ Is it necessary for my project?
- ▶ Leveling resources
- ▶ Top-down vs bottoms up planning

Integration with EV Engine

- ▶ Fields needed (CA, WP, EVT, Milestone IDs, Milestone Weights)

Updating Status

- ▶ Actuals, remaining duration
- ▶ Let the network do the math!

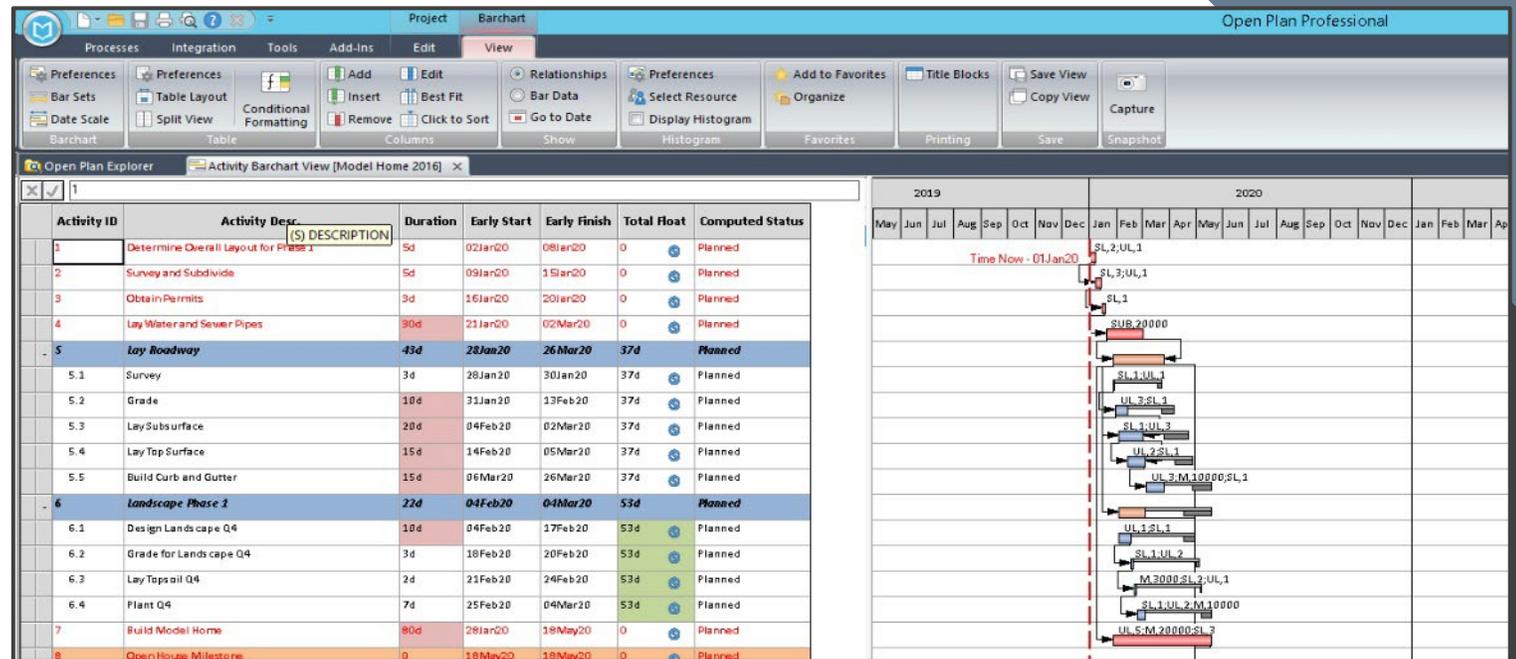


Image Source: EVM Tool

Classes

What's the Difference?

- ▶ Classes - Tool to segregate cost records / resource assignments (Budget, Forecast, Actuals, Earned)
- ▶ Cost Sets - Group related classes together for reporting

Uses for Classes

- ▶ Accruals
- ▶ Unbillable/Unallowable
- ▶ Tracking modifications, Unapproved Budget
- ▶ Internal vs External reporting
 - Different rates can be applied to the same inputs (i.e., hours) for T&M vs Internal Cost Buildups

Cost Class	Customer Reporting Cost Set	Internal Reporting Cost Set
Actuals	x	x
Accruals	x	x
Unallowables		x

IMPLEMENTATIONS

Classes

What Level?

- ▶ Classes can be set to either CA or WP levels, depending on your needs
- ▶ Potential Uses for CA level:
 - Actuals
 - Planning Packages
- ▶ WP Level:
 - Budgeting
 - Earned
 - Detailed FC
 - Actuals (if available)

Cobra Explorer Project - Demo Advanced X

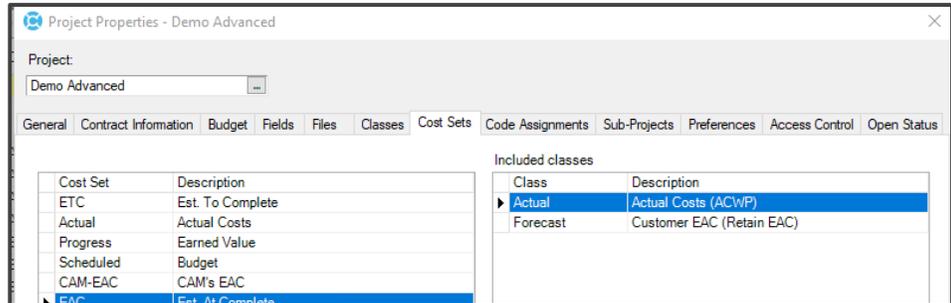
Spreadsheet Status Date: 11/30/2015 Time-phase

	WBS	OBS	WP	Resource	Description	Class	Total	6/30/2015	07/31/2015	08/31/2015
Total					Space Shuttle		459,840.49	69,786.90	82,688.93	36,856.29
	1.1.1.1	1400			Frame Design		236,410.64	69,786.90	82,688.93	36,856.29
	1.1.1.1	1400	01		Fuselage		92,735.48	36,115.79	48,421.48	
	1.1.1.1	1400	01	DRAFT	Draftsmen	Actual	6,102.00	2,034.00	4,068.00	0.00
	1.1.1.1	1400	01	MANAGE	Management	Actual	7,078.32	3,145.92	3,932.40	0.00
	1.1.1.1	1400	01	SENG	Structural Engineers	Actual	14,060.60	5,717.80	8,342.80	0.00
	1.1.1.1	1400	01	TECH	Technicians	Actual	7,797.00	2,712.00	5,085.00	0.00
	1.1.1.1	1400	01	DRAFT	Draftsmen	Budget	5,429.83	2,778.03	2,651.80	
	1.1.1.1	1400	01	MANAGE	Management	Budget	5,248.84	2,685.43	2,563.41	
	1.1.1.1	1400	01	SENG	Structural Engineers	Budget	11,382.83	5,823.78	5,559.05	
	1.1.1.1	1400	01	TECH	Technicians	Budget	6,787.28	3,472.53	3,314.75	
	1.1.1.1	1400	01	DRAFT	Draftsmen	Earned	5,429.83	1,457.28	2,428.80	
	1.1.1.1	1400	01	MANAGE	Management	Earned	5,248.84	1,412.45	2,347.84	
	1.1.1.1	1400	01	SENG	Structural Engineers	Earned	11,382.83	3,054.97	5,091.63	
	1.1.1.1	1400	01	TECH	Technicians	Earned	6,787.28	1,821.60	3,036.00	
	1.1.1.1	1400	01	DRAFT	Draftsmen	Forecast	0.00			
	1.1.1.1	1400	01	MANAGE	Management	Forecast	0.00			
	1.1.1.1	1400	01	SENG	Structural Engineers	Forecast	0.00			
	1.1.1.1	1400	01	TECH	Technicians	Forecast	0.00			
	1.1.1.1	1400	02		Wing Design		95,915.85	12,402.91	16,005.15	34,939.81
	1.1.1.1	1400	03		Heat Shield Design		47,759.31	21,268.20	18,262.30	1,916.48
	1.2.3	1000			Emergency Rescue		223,429.85			
	1.2.3	1000		TECH	Technicians	PA	193,429.85			
	1.2.3	1000		TRVL	Travel	PA	30,000.00			
							0.00			

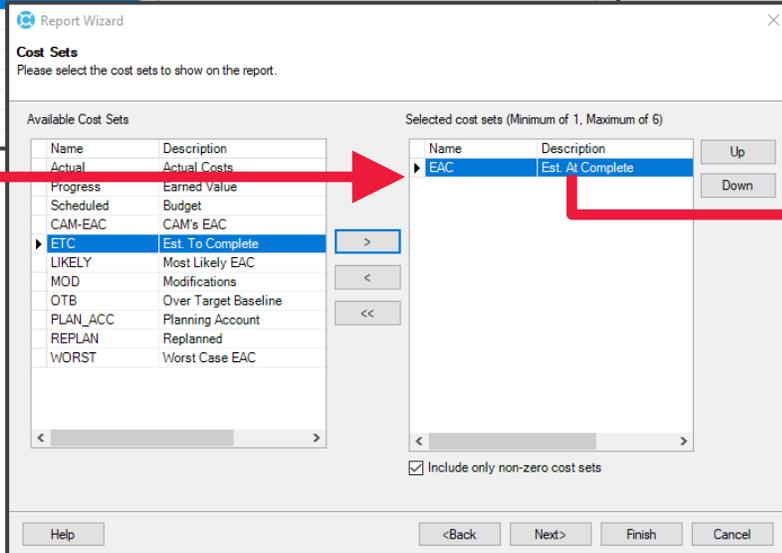
Image Source: EVM Tool

IMPLEMENTATIONS

Cost Sets



- ▶ Reporting data is run against cost sets, not cost classes
- ▶ For example, the EAC cost set includes the Actual and Forecast class



The screenshot shows a spreadsheet with columns A, B, C, and D. The data is organized into rows representing different cost accounts and their associated costs. The 'EAC' cost set is highlighted in green in the first row.

	A	B	C	D
1	Control Account	Results		PREVIOUS
2	1.1.1.1 / 1400 Frame Design			
3			Est. At Complete	3,467.73
4		DIRECT		
5			Est. At Complete	3,120.00
6		G&A		
7			Est. At Complete	347.73
8	1.1.1.2 / 1420 Propulsion Design			
9			Est. At Complete	9,256.95
10		DIRECT		
11			Est. At Complete	8,405.80
12		G&A		
13			Est. At Complete	851.15
14	1.1.2.1 / 1600 Ergonomics Design			
15			Est. At Complete	0.00
16		DIRECT		
17			Est. At Complete	0.00
18		G&A		
19			Est. At Complete	0.00

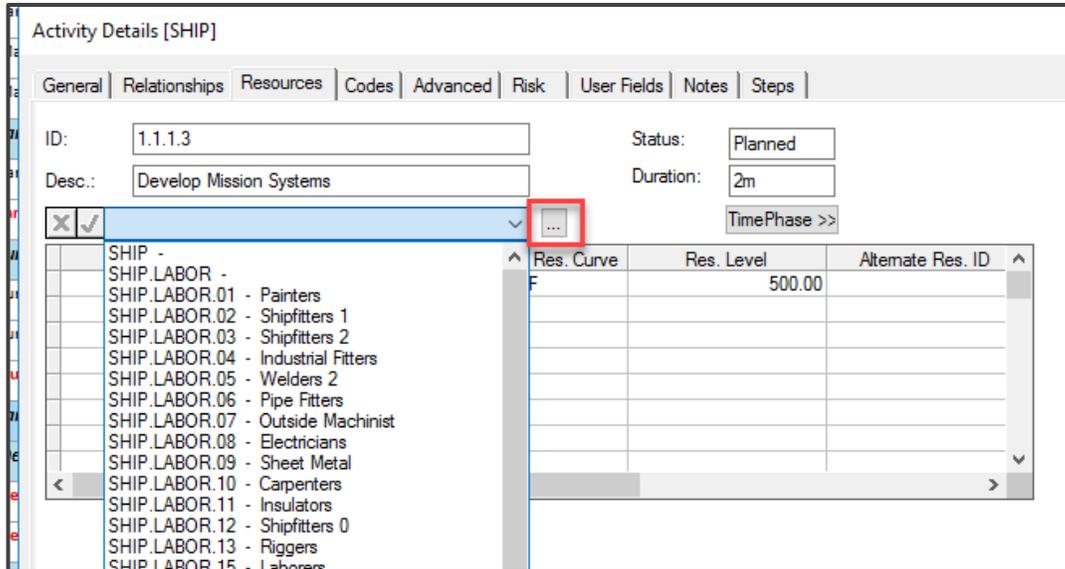
Image Source: EVM Tool

IMPLEMENTATIONS

Project Data

Where Is Your Budget Coming From?

- ▶ Resource loaded IMS
- ▶ Pricing File / BOE from proposal
- ▶ Starting from scratch with a target value but no supporting documentation?



	WBS	OBS	WP	Resource	Description	Class	Total
Total					Space Shuttle		31,829.50
	1.1.1.2	1420	04		Booster Release Design		
	1.1.1.2	1420	04	DRAFT	Draftsmen	Budget	500.00
	1.1.1.2	1420	04	EENG	Electrical Engineers	Budget	2,052.83
	1.1.1.2	1420	04	MANAGE	Management	Budget	5,000.00

Task Mode	Task Name	Work	Start	Details	1/17	1/24	Feb '16 1/31
13	Experiment Room	7,552 hrs	1/19/2016	Work	96h	120h	120h
	DRAFT	500 hrs	1/19/2016	Work	32h	40h	40h
	EENG	2,052 hrs	1/19/2016	Work	32h	40h	40h
	MANAGE	5,000 hrs	1/19/2016	Work	32h	40h	40h
14	Sleeping Quarters	0 hrs	2/19/2016	Work			
15	Cargo Bay	0 hrs	12/21/2015	Work			
16	Experiment Design	0 hrs	12/21/2015	Work			
17	Crystal Growth	0 hrs	2/19/2016	Work			
18	Construction - Prefab. Build. Matrl	0 hrs	12/21/2015	Work			

Image Source: EVM Tool

Loading IMS Resource Data Into Cobra Via Integration Wizard

Cobra Explorer Project - Demo Advanced x Resources - Demo Adv Resources

Spreadsheet Status Date: 11/30/2015 Time-phase

	WBS	OBS	WP	Resource	Description	Class	Total	3/31/20
Total					Space Shuttle		31,829.50	
▶	1.1.1.2	1420	04		Booster Release Design			
	1.1.1.2	1420	04	DRAFT	Draftsmen	Budget	500.00	
	1.1.1.2	1420	04	EENG	Electrical Engineers	Budget	2,052.83	
	1.1.1.2	1420	04	MANAGE	Management	Budget	5,000.00	

Integration Wizard

Schedule Mapping
Configure how your schedule is linked to your Cobra project by selecting the schedule fields that contain Cobra field.

Project Keys Control Account Codes Work Package Codes User Fields

Schedule Fields: Cobra file used for

WBS: CA Demo Adv WBS

OBS: OBS Demo Adv OBS

WP: WP

Milestone:

General Miles

Status: In-progress

IMPLEMENTATIONS Project Data

Task Mode	CA	OBS	WP	PMT	MS ID	MS Weight	Task Name
1	1.1.1.1	1400				0	DESCRIP
2	1.1.1.1	1400	01	E		0	Frame Design
3	1.1.1.1	1400	02	B		0	Fuselage
4	1.1.1.1	1400	03	H		0	Wing Design
5	1.1.1.2	1420				0	Heat Shield Design
6	1.1.1.2	1420	01	E		0	Propulsion Design
7	1.1.1.2	1420	02	G		0	Fuel Design
8	1.1.1.2	1420	03	C		0	Ignition Design
9	1.1.1.2	1420	04	C		0	Regulators Design
10	1.1.2.1	1600				0	Booster Release Design
11	1.1.2.1	1600	01	C		0	Ergonomics Design
12	1.1.2.1	1600	02	C		0	Control Room
13	1.1.2.1	1600	03	H		0	Experiment Room
14	1.1.2.1	1600	04	H		0	Sleeping Quarters

Image Source: EVM Tool

IMPLEMENTATIONS

Project Data

Loading From Flat File (Pricing Sources, BOE, etc.)

- ▶ Considerations: ensure dates are synced since IMS not being used
 - i.e., From Date, To Date are within Baseline Dates
- Supports program milestones

The screenshot displays the Cobra Explorer software interface. The 'Integration' ribbon is active, and the 'File' icon is highlighted with a red box. A red arrow points from this icon to the 'File' checkbox in the 'Import File Field Mapper' dialog box. The dialog box is open over a spreadsheet view of project data. The spreadsheet shows columns for WBS, OBS, WP, Resource, Description, Class, Total, 3/31/2015, and 09/30. The 'Import File Field Mapper' dialog has a table with columns 1 through 9, and a checkbox 'File contains a header row' which is checked. The table data is as follows:

	1	2	3	4	5	6	7	8	9
1	WBS	WP	Resource	Baseline Start D	Baseline Finish	From Date	To Date	HOURS	DIRECT
2	1.123.01	1.123.01.01	PM	1/3/2022	6/30/2022	1/3/2022	1/28/2022	152	8441.32
3	1.123.01	1.123.01.01	PM	1/3/2022	6/30/2022	1/29/2022	2/25/2022	152	8441.32
4	1.123.01	1.123.01.01	PM	1/3/2022	6/30/2022	2/26/2022	3/25/2022	160	8885.6
5	1.123.01	1.123.01.01	PM	1/3/2022	6/30/2022	3/26/2022	4/29/2022	200	11107
6	1.123.01	1.123.01.01	PM	1/3/2022	6/30/2022	4/30/2022	5/27/2022	160	8885.6
7	1.123.01	1.123.01.01	PM	1/3/2022	6/30/2022	5/28/2022	6/24/2022	144	7997.04
8	1.123.01	1.123.01.01	PM	1/3/2022	6/30/2022	6/25/2022	6/30/2022	32	1777.12
9	1.123.01	1.123.01.01	AS3	1/3/2022	6/30/2022	1/3/2022	1/28/2022	152	2352.96
10	1.123.01	1.123.01.01	AS3	1/3/2022	6/30/2022	1/29/2022	2/25/2022	152	2352.96

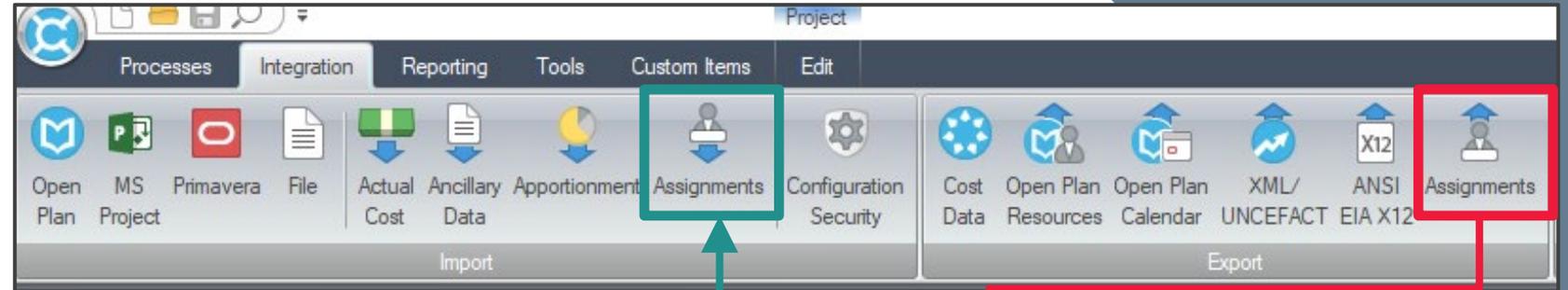
Image Source: EVM Tool

IMPLEMENTATIONS

Project Data

How Will You Update Forecast?

- ▶ Assignment Export/Import (shown)
- ▶ Flat File
- ▶ Directly within Cobra Interface
- ▶ via integrated tools such as PM Compass workflow



	A	B	C	D	E	F	G	H	I	J
1	Project: Demo Advanced: Space Shuttle			Class: Forecast		06/30/2015	07/31/2015	08/31/2015	09/30/2015	10/31/2015
2	Control Account	Work Package	Resource	Start	Finish					
3	1.1.1.1 / 1400 : Frame Design (Closed)			01-Jun-15	13-Oct-15					
4		01 : Fuselage (Closed)		01-Jun-15	12-Jul-15					
5			DRAFT	HOURS		163.72	156.28			
6			MANAGE	HOURS		81.86	78.14			
7			SENG	HOURS		179.07	170.93			
8			TECH	HOURS		204.65	195.35			
9		02 : Wing Design (Closed)		01-Jun-15	13-Oct-15					
10			DRAFT	HOURS		32.29	30.83	33.76	32.29	30.83
11			MANAGE	HOURS		32.29	30.83	33.76	32.29	30.83
12			SENG	HOURS		92.02	74.34	81.43	77.87	74.34
13			TECH	HOURS		46.49	195.59	141.38	112.32	54.22
14		03 : Heat Shield Design (Closed)		01-Jun-15	13-Jul-15					
15			DRAFT	HOURS		103.79	196.21			
16			MANAGE	HOURS		51.20	28.80			
17			SENG	HOURS		98.40	21.60			
18			TECH	HOURS		191.99	108.01			

Image Source: EVM Tool

- ▶ How will you import Actual Costs?
 - Flat File (.csv) from Accounting system
 - Costpoint to Cobra Connection
- ▶ Do your Accounting Project IDs match CA or WPs?

	A	B	C	D	E	F
1	WBS	WP	RESOURCE	Cost Date	Hours	Direct
2	1.123.01	1.123.01.01	33532	1/28/2022	140	7774.9
3	1.123.01	1.123.01.01	93469	1/28/2022	152	2352.96
4	1.123.01	1.123.01.01	30757	1/28/2022	60	845.4
5	1.123.01	1.123.01.01	51848	1/28/2022	160	8067.2
6	1.123.01	1.123.01.01	TRVL	1/28/2022		300
7	1.123.01	1.123.01.02	41648	1/28/2022	25	704.5
8	1.123.01	1.123.01.02	69878	1/28/2022	40	1293.8
9	1.123.01	1.123.01.02	93366	1/28/2022	40	1286.2
10	1.123.02	1.123.02.01	96391	1/28/2022	40	2033.2
11	1.123.02	1.123.02.01	50236	1/28/2022	20	542.4
12	1.123.02	1.123.02.01	82768	1/28/2022	38	865.07

IMPLEMENTATIONS Project Data

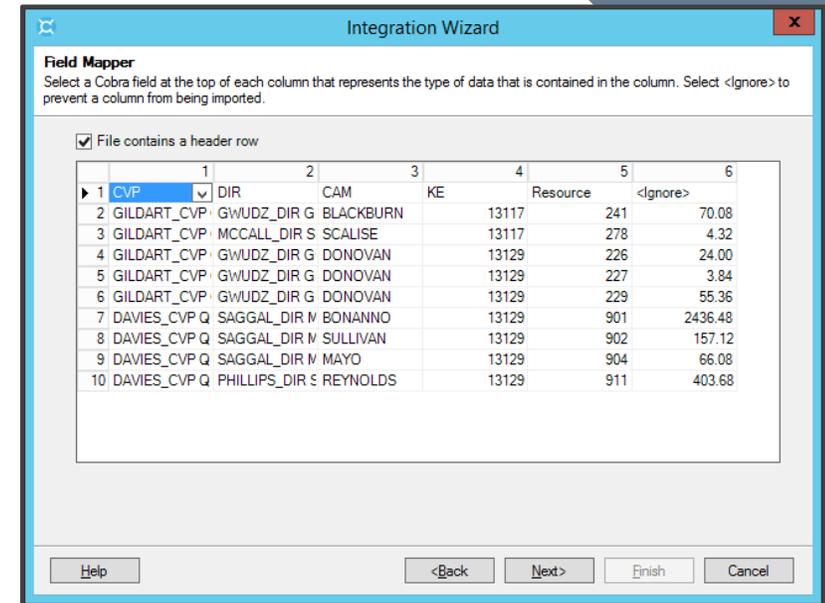
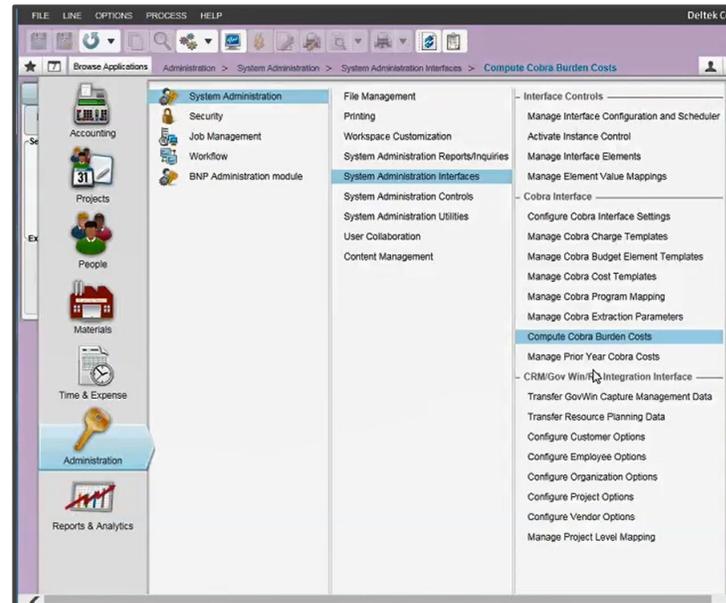


Image Source: EVM Tool

IMPLEMENTATIONS

Status

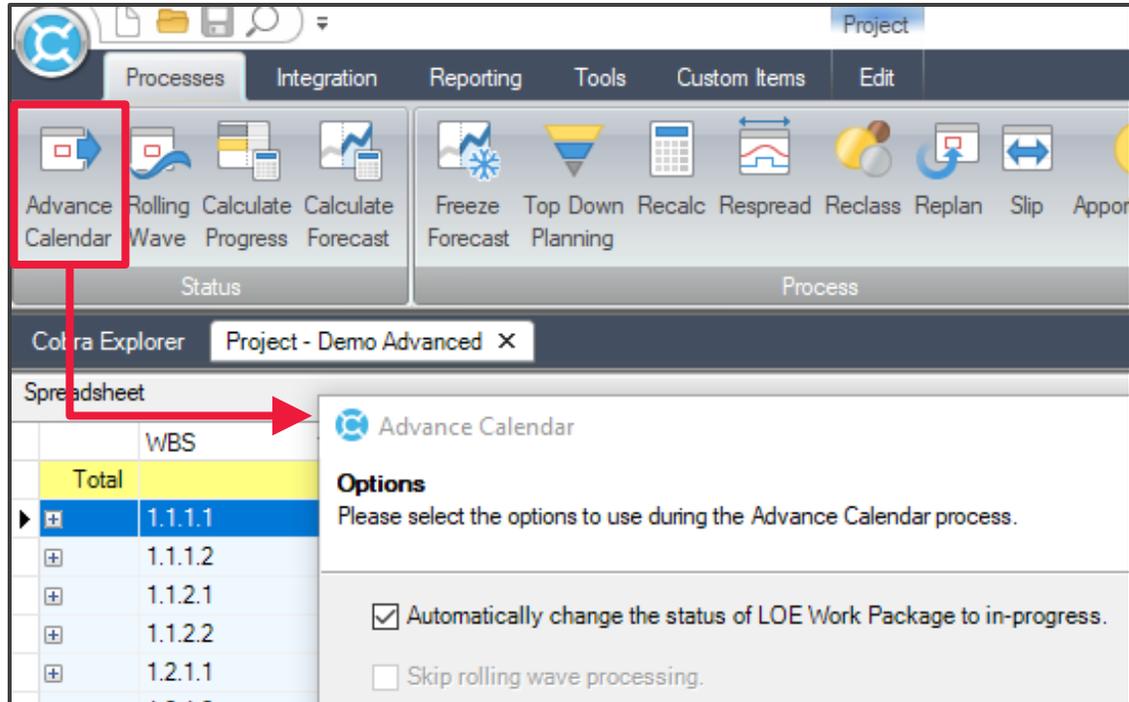


Image Source: EVM Tool

- ▶ How will you status your Project?
 - Integration with IMS file
 - Flat File
 - Directly within Cobra Interface
 - Via other tools such as PM Compass workflows
- ▶ What do you need to status Cobra?
 - % Complete
 - Actual Start / Finish
 - Forecast Start / Forecast Finish
 - Milestone date updates
- ▶ LOE activities
 - Can be contained within status files, or
 - Cobra can automatically status during Calendar advancement

Existing Projects



Extraction

- ▶ Can you export all project data from existing tool (Budget, Performance, Actuals, Forecast)?
- ▶ Does data exist in spreadsheets?



Formatting

- ▶ All data can be imported into Cobra via Integration wizard
- ▶ Headers on import files will vary depending on Cobra file type
 - Typically need CA/WP and dates at a minimum, resources for time-phased data



Data Cleansing

- ▶ Is your hierarchy well maintained?
 - Do you have both Parent / Child elements that make up Control Accounts?
 - Are all levels present?
 - Are all Work Packages unique to a single CA?

Data Cleansing (cont.)

- ▶ Are your resource assignment dates contained within the WP baseline and forecast dates?
- ▶ Do you have leading or trailing 0's in your data?
- ▶ How were dates exported and formatted from legacy data?
- ▶ Do multiple assignments for the same resource exist within the same WP and class?
- ▶ Do you have EVT's mapped to appropriate Cobra codes, and do all WPs have them?

Cobra Progress Technique	Cobra Code
Level of Effort	A
Milestone	B
Percent Complete	C
50-50	E
0-100	F
User Defined %	H
Planning Package	K
Calculated Apportioned	M

WBS	Element
1.1	Control Account
1.2	Control Account
1.3	Control Account
1.3.1	Control Account

Image Source: EVM Tool

WBS	WP	Resource	Baseline Start Date	Baseline Finish Date	From date	To date	Hours	Direct
1.123.01	1.123.01.01	PM	1/3/2022	4/30/2022	1/3/2022	1/28/2022	152	8441.32
1.123.01	1.123.01.01	PM	1/3/2022	4/30/2022	1/29/2022	2/25/2022	152	8441.32
1.123.01	1.123.01.01	PM	1/3/2022	4/30/2022	2/26/2022	3/25/2022	160	8885.6
1.123.01	1.123.01.01	PM	1/3/2022	4/30/2022	3/26/2022	4/29/2022	200	11107
1.123.01	1.123.01.01	PM	1/3/2022	4/30/2022	4/30/2022	5/27/2022	160	8885.6
1.123.01	1.123.01.01	PM	1/3/2022	4/30/2022	5/28/2022	6/24/2022	144	7997.04
1.123.01	1.123.01.01	PM	1/3/2022	4/30/2022	6/25/2022	6/30/2022	32	1777.12

IMPLEMENTATIONS

Existing Projects

IMPLEMENTATIONS

Existing Projects

Time-Phasing

How do you want to load your data into Cobra?

- ▶ Historical (Budget, Forecast, Actuals)
 - Cumulative to date in prior period, latest month in current period
 - Load monthly data for current year
 - Load all periods
- ▶ Earned Value
 - Cobra does not readily import EV values
 - Cobra calculates EV based on Budget resources, which is not always available in legacy tools
 - Budget changes in the past can complicate reconciliation of prior EV values



IMPLEMENTATIONS

Earned Value

Calculate legacy ITD BCWP in prior Cobra period, then calculate BCWP by period going forward

- ▶ Less migration effort
- ▶ Less clutter in the first period that EV is calculated



Load time-phased historical BCWP, with possible reversal and transition to Cobra budget resources in next period

- ▶ Access to historical data in Cobra
- ▶ Can place historical values in separate class to filter out in views

- ▶ Lose access to historical EV
- ▶ Will need to reference other artifacts as needed for %completes, dates
- ▶ Potentially time consuming



- ▶ Reversals and adjustments may be required by Cobra for in-progress WPs
- ▶ More data prep for migration
- ▶ SQL scripts are needed to complete the loading of time-phased EV data

IMPLEMENTATIONS

Reporting

Out of the Box

- ▶ Legacy IPMR Formats 1- 5
- ▶ 533M and 533 Q
- ▶ Timephased
- ▶ Control Account Plan (CAP)
- ▶ Work Authorization Documents (WAD)
- ▶ Responsibility Assignment Matrix (RAM)

Exports

- ▶ IPMDAR
- ▶ Deltek Acumen, wlnsight

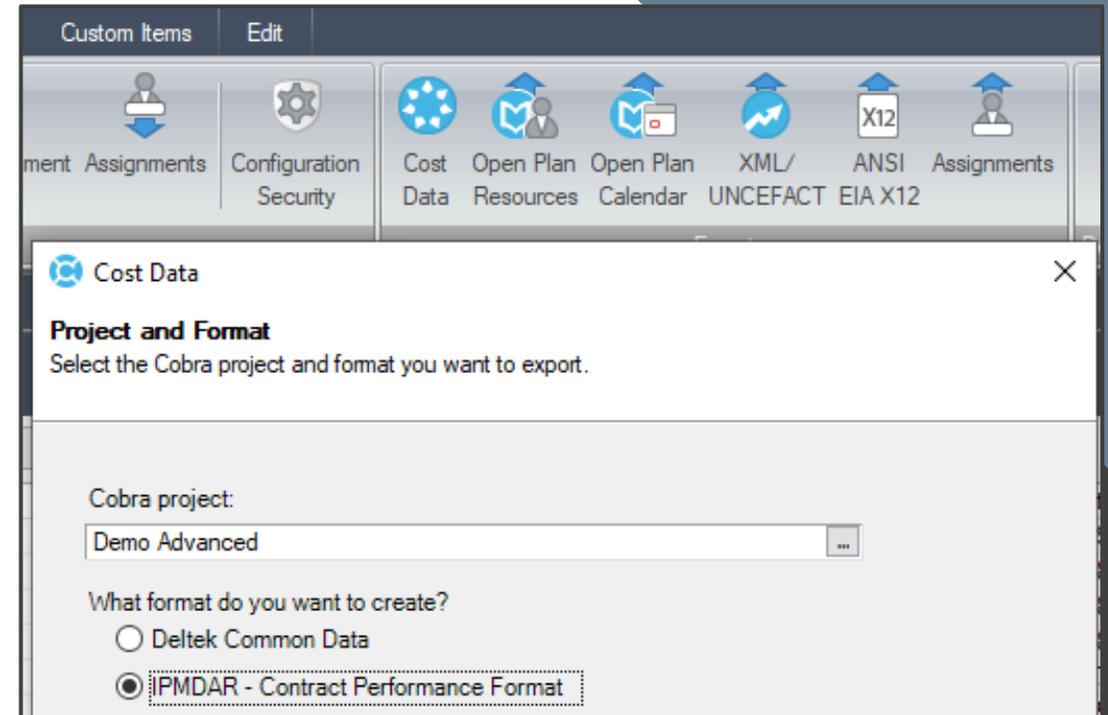


Image Source: EVM Tool

Existing Projects

PARALLEL PROCESSING

Are You Ready to Turn-off Your Legacy System and Being Operating Solely in Cobra?

- ▶ If not, a few months of operating in both systems is a good idea
- ▶ Perform internal and customer deliverable requirements in legacy system on your normal monthly close schedule, then
- ▶ Replicate in Cobra simultaneously or afterwards and see how well you did
- ▶ Helps with learning the tool and processes needed to operate

Things to Track:

- ▶ BCRs, ancillary data changes (rates, WBS, resources), Actuals, Progress, and Forecast updates, status
- ▶ Client reporting - Formatting changes are often acceptable but prior period reports must reconcile to your first delivery out of Cobra

Get to Know Robert Ameen

DIRECTOR, BDO INDUSTRY SPECIALTY SERVICES - PROGRAM OPTIMIZATION & PROJECT CONTROLS SOLUTIONS

Robert Ameen is a Director for the BDO Government Industry Specialty Service (ISS) and the Program Optimization and Project Controls team. He has over 25 years of experience in a variety of engineering and Government contracting environments, specializing in Project Control and Earned Value Management Systems.

Robert has extensive experience with EVMS data architecture, systems implementation, and fully compliant EVMS Reporting. His background in database and tool development, combined with his operational project control experience provides a unique advantage in data integrity and efficiency during implementations and monthly operations. In addition, he has extensive experience developing project baselines and preparing for Integrated Baseline Reviews (IBRs).

Robert holds the Earned Value Professional (EVP) certification from the American Association of Cost Engineers (AACEi), the Project Management Professional (PMP) certification from the Project Management Institute (PMI), and a Graduate Certificate in EVM from the PMI. He holds a B.S. in Mechanical Engineering from Virginia Tech, and an M.B.A. from Old Dominion University.



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Get to Know Kelsey Johnikin

MANAGER, BDO INDUSTRY SPECIALTY SERVICES - PROGRAM OPTIMIZATION & PROJECT CONTROLS SOLUTIONS

Kelsey Johnikin is a Manager for BDO's Industry Specialty Services Group in the Program Optimization and Project Controls team. She has over 10 years of experience as a Project Controls Analyst on major Department of Defense projects. In this capacity, she uses the Deltek PPM suite to track, manage, and report against program performance metrics using the Earned Value Management methodology. This involved interfacing with the different program roles and corporate executives to ensure compliant execution against contract requirements while still maximizing margins on the program.

Kelsey's experience includes configuring and processing the EVM Tools and working with program teams to develop a process design that allows for seamless monthly processing. This requires a thorough understanding of how the tools operate but also necessitates the synthesis and manipulation of data from external sources into their EVM tool. Through her years in the industry including experience as a project controls analyst, Kelsey brings an intimate knowledge of the needs of analyst.

Kelsey holds the holds a B.S. in Economics from Jacksonville State University, a Master of International development for Saint Mary's University Minnesota and an M.B.A. from Troy University.



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