

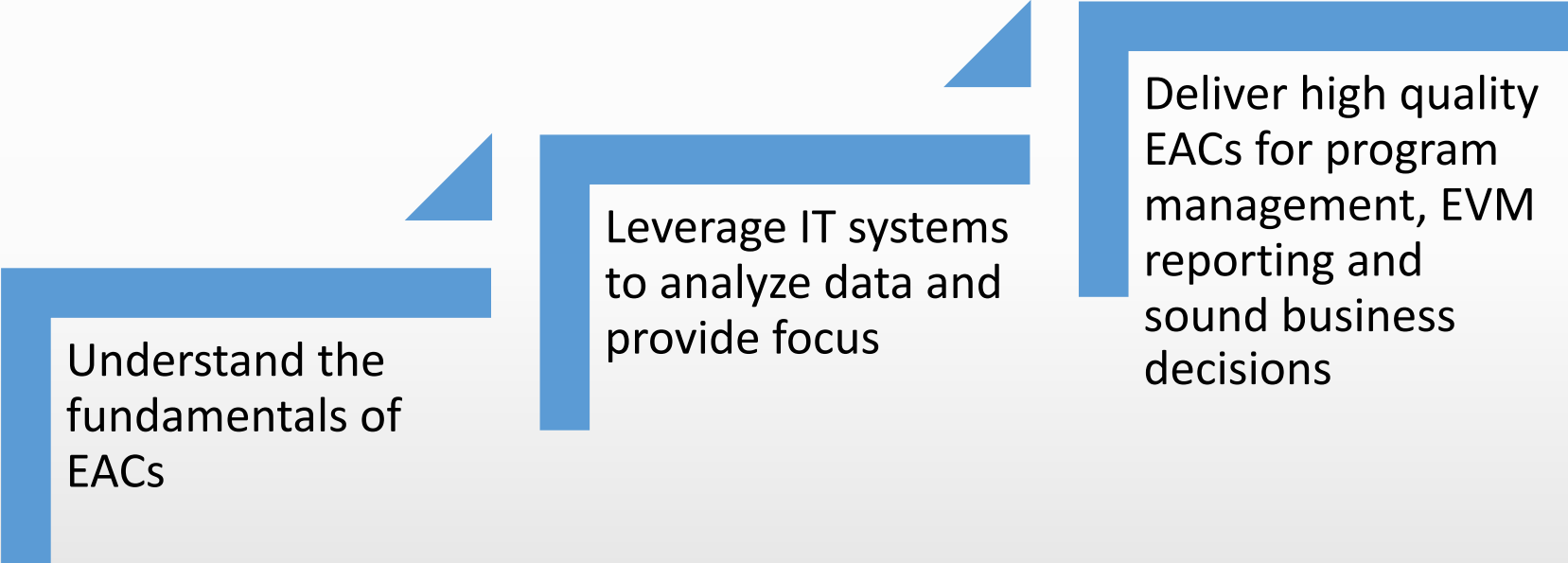


# Leveraging Business Intelligence to Ensure Projects Come in On Cost

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Pratt & Whitney

# Learning Objectives



Understand the fundamentals of EACs

Leverage IT systems to analyze data and provide focus

Deliver high quality EACs for program management, EVM reporting and sound business decisions

# PRATT & WHITNEY

## Markets



**Military  
Engines**



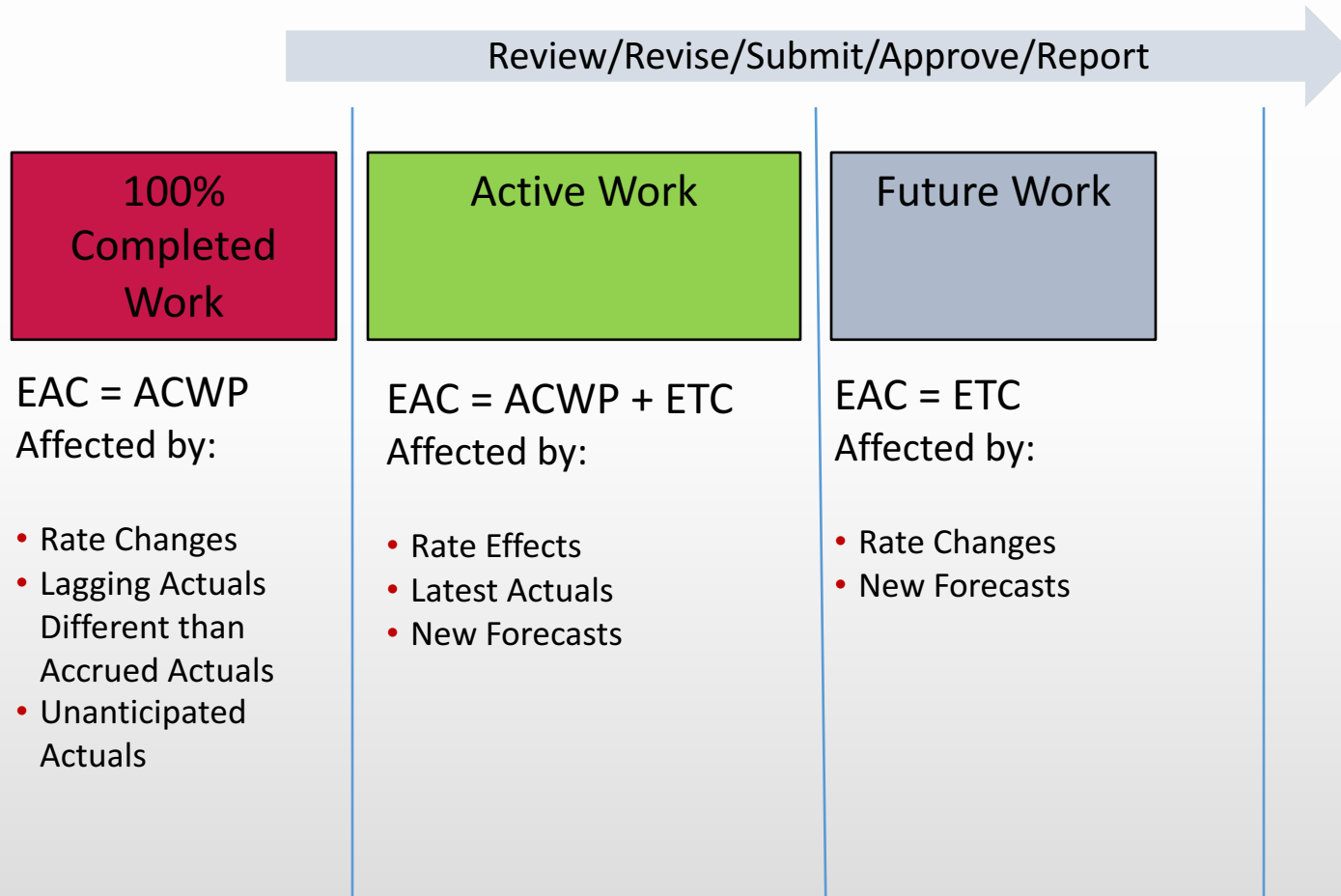
**Commercial  
Engines**



**Pratt & Whitney  
Canada**

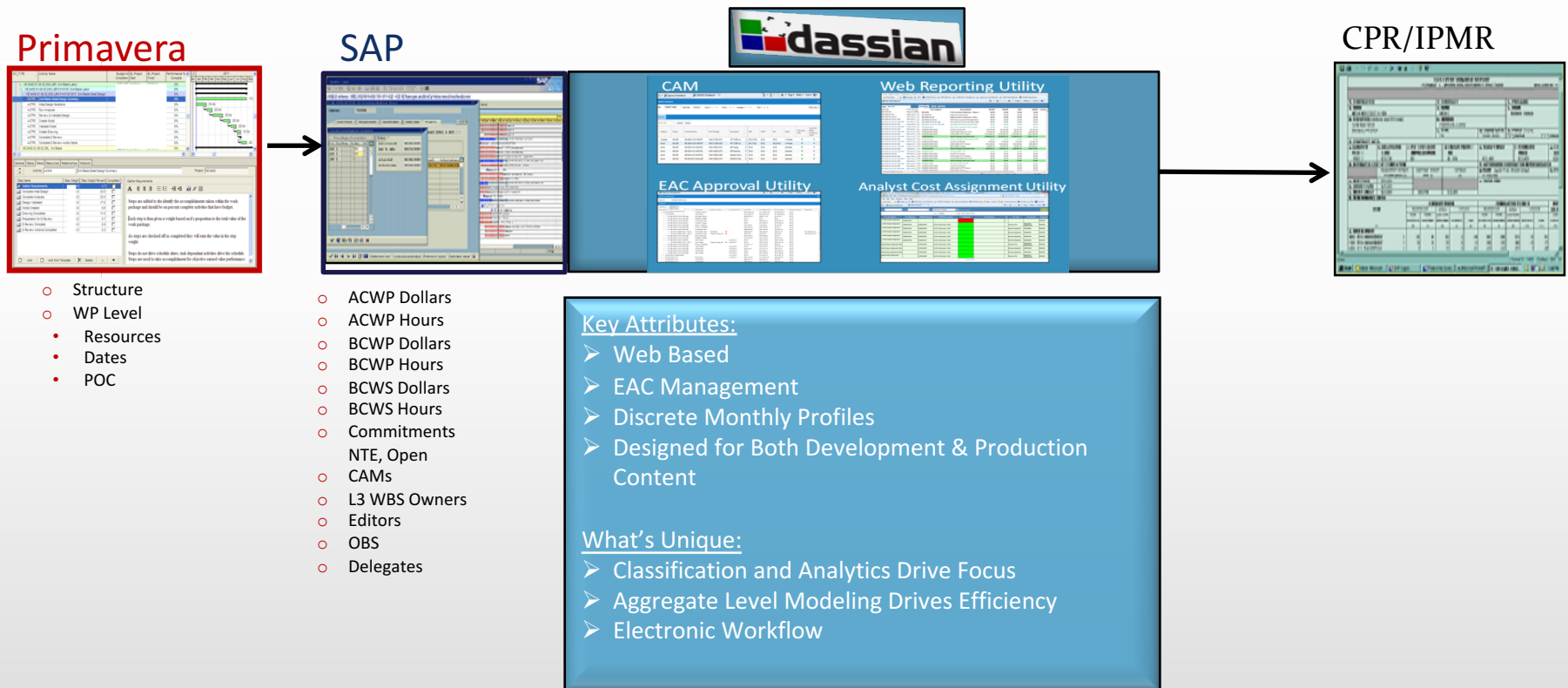
# What makes up an Estimate at Complete (EAC)

EACs combine Actuals + Estimate to Complete (ETC)



# Estimate At Complete (EAC) Process

## Efficient architecture and interface for CAM



# KEY ASPECTS OF DESIGN

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- Leverage SAP infrastructure and utility.
- Leverage web for interface.
- Maximize ACWP postings to workpackage level.
- Focus effort through the segregation of “Complete”, “In-Process” and “Future work”, as well as, the use of indicators to spot areas of concern or areas where detail analysis is required.
- Labor modeling utilities that make use of performance factors and labor distribution methods to assist in ETC development.
- For production hardware, ETC utility that makes use of MRP timing and cost distribution based on CAM EAC input.
- Synergized effort to address lagging actuals at the same time as ETC. forecasting.
- Real time costing of ETC input.
- Don't change CAM's data.
- Electronic workflow and electronic data flow to CPR/IPMR.



# CAM EAC Workbench

## Visual indicators drive focus

The screenshot shows the CAM EAC Workbench interface. At the top, there's a summary bar with the following data: Active: 20 - 0 - 20, Future: 2 - 0 - 2, Complete: 0 - 0 - 0, Total: 22 - 0 - 22. Below this is a table with columns: Category, Project, Control Account, Work Package, Description, BAC, ACWP, EAC, Status, CPI versus TCPI, and Labor last Month Forecast vs Actual. The table lists four active work packages. A red box highlights the 'Active' status in the first column of the table. A red box highlights the summary bar. Red arrows point from the 'Needs attention' label to the 'Active' status in the table and the 'Active' count in the summary bar. A red arrow points from the 'OK' label to the 'Future' count in the summary bar. A red arrow points from the 'Total' label to the 'Total' count in the summary bar.

Summary Bar: Active: 20 - 0 - 20, Future: 2 - 0 - 2, Complete: 0 - 0 - 0, Total: 22 - 0 - 22

Category	Project	Control Account	Work Package	Description	BAC	ACWP	EAC	Status	CPI versus TCPI	Labor last Month Forecast vs Actual
Active	ME.4035	ME.4035-01-03-02-200-LBR	NWA 5169043 0010		\$1,453.31	\$1,766.16	\$1,766.16	In Process	Green	Green
Active	ME.4035	ME.4035-01-03-09-200-LBR	NWA 5169048 0010		\$1,340.61	\$1,801.17	\$1,801.17	Program Ap...	Green	Green
Active	ME.4035	ME.4035-01-03-15-200-LBR	NWA 5168595 0010		\$1,508.42	\$1,075.78	\$1,075.78	In Process	Green	Green
Active	ME.4035	ME.4035-01-03-15-300-LBR	NWA 5169051 0010		\$8,868.07	\$8,076.47	\$8,251.29	In Process	Red	Red

The screenshot shows a detailed view of the work packages. It includes a summary bar with the following data: Active: 0 - 0 - 0, Total: 22 - 0 - 22. Below this is a table with columns: CPI versus TCPI, Labor last Month Forecast vs Actual, Actual vs FPR Run Rate, Cost Last Month Forecast vs Actual, Commitme... > ETC, and EAC Date Changes. The table lists four work packages. A red box highlights the 'Active' status in the first column of the table. A red box highlights the summary bar. Red arrows point from the 'Needs attention' label to the 'Active' status in the table and the 'Active' count in the summary bar. A red arrow points from the 'OK' label to the 'Future' count in the summary bar. A red arrow points from the 'Total' label to the 'Total' count in the summary bar.

Summary Bar: Active: 0 - 0 - 0, Total: 22 - 0 - 22

CPI versus TCPI	Labor last Month Forecast vs Actual	Actual vs FPR Run Rate	Cost Last Month Forecast vs Actual	Commitme... > ETC	EAC Date Changes
Green	Green	Green	Green	Green	Green
Green	Green	Green	Green	Green	Green
Green	Green	Green	Green	Green	Green
Red	Red	Green	Red	Red	Green



Maintain work package (edit)



Display work package (already submitted for approval)



Indicators

# EAC workbench – Actuals

Synergize effort with entry of lagging actual costs

The screenshot shows the CAM EAC Workbench interface. At the top, there's a navigation bar with 'Approver Workbench' and 'CAM EAC Workbench'. Below this, a status bar shows 'CAM: RYAN J. CARR', 'Gate Date: 12/24/2013', and various counts for Active, Future, Complete, and Total. The main section is titled 'Overview' and shows 'NWA 5168304 0010 - Demo'. It includes fields for 'Control Account: ME.4035-01-14-05-250-LBR Work Package: NWA 5168304 0010', 'Status: In Process', 'Current ETC Period: 01/02/2014', 'Last Approved EAC Period: 11/27/2013', 'EV Method: POC 89.4%', 'Last Approved EAC: \$170,000.79', and 'Current EAC: \$180,000.00'. Below this are sections for 'Indicators' and 'Substantiation'. A 'Filter' dropdown is set to 'Labor Planning', with 'Submit' and 'Save' buttons. The main table displays data for the 'Last 6 Months' (Cum. Thru., Jul-13, Aug-13, Sep-13, Oct-13, Nov-13, Dec-13) and includes columns for 'Correction To Actuals', 'Corrected Dec-13', 'To Date', 'Average Actual \$/Hr', and 'Forecast \$/Hr'. The table is divided into sections for '511551-Outsourcing - North' and '2556 -2556-SDCI-Config Mgmt'. A red box highlights the 'Correction To Actuals' column.

Unit ↑	Last 6 Months							Correction To Actuals	Corrected Dec-13	To Date	Average Actual \$/Hr	Forecast \$/Hr
	Cum. Thru.	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13					
511551-Outsourcing - North												
Actual/ETC - Base	\$1,000.00	\$1,000.00	\$1,000.00	\$1,000.00	\$1,000.00	\$1,000.00	\$1,000.00	\$0.00	\$1,000.00	\$1,000.00		
Actual/ETC - Total	\$1,000.00	\$1,000.00	\$1,000.00	\$1,000.00	\$1,000.00	\$1,000.00	\$1,000.00	\$0.00	\$1,000.00	\$1,000.00		
511551-Outsourcing - North												
Actual/ETC - Base	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00		
Actual/ETC - Total	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00		
511551-Outsourcing - North												
Actual/ETC - Base	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$532.88	\$0.00	\$532.88	\$532.88		
Actual/ETC - Total	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$564.11	\$0.00	\$564.11	\$564.11		
2556 -2556-SDCI-Config Mgmt												
Actual/ETC - Base	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00		
Actual/ETC - Total	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00		



# EAC Workbench – Entering ETC

Preloaded with prior ETC, real time costing

**CAM EAC Workbench**

CAM: RYAN Gate Date: 12/24/2013 Active: 20 - 0 - 20 Future: 2 - 0 - 2 Complete: 0 - 0 - 0 Total: 22 - 0 - 22 Web Links

Overview NVIA 5168304 0010

Control Account: ME.4035-01-14-05-250-LBR Work Package: NVIA 5168304 0010

Status: In Process Current ETC Period: 01/02/2014 Last Approved EAC Period: 11/27/2013  
EV Method: POC 89.4% Last Approved EAC: \$170,000.79 Current EAC: \$100,070.35

Indicators

Substantiation

Filter Labor Planning Submit Save

Unit ↑	Current							Future			
	Average Actual \$/Hr	Forecast \$/Hr	ETC Chosen Rate	Open Commitme...	ETC Start	ETC Finish	Loading Curve	Jan-14	Feb-14	ETC Total	EAC
Summary											
Actual/ETC - Hours								368.00 hrs	368.00 hrs	0.0000	1,000.48 hrs
Actual/ETC - Base								\$28,171.09	\$20,487.95	\$48,659.04	\$100,070.29
Actual/ETC - Total								\$28,171.09	\$20,487.95	\$48,659.04	\$100,070.29
511537-Computer - 0030											
Actual/ETC - Base				\$0.00	01/02/2014	02/24/2014		\$437.19	\$317.94	\$755.13	\$755.13
Computer charge - 0001											
Actual/ETC - Base				\$0.00	12/24/2013	12/24/2013		\$0.00	\$0.00	\$0.00	\$0.00
511551-Outsourcing - North -											
Actual/ETC - Base				\$12,487.95	01/02/2014	02/24/2014		\$12,487.95	\$12,487.95	\$24,975.90	\$24,975.90

ETC Entry Area

# EAC Workbench - ETC Modeling

Modeling feature increases productivity

The screenshot displays the CAM EAC Workbench application. The main window shows project details for 'CAM: RYAN' with a 'Gate Date' of 12/24/2013. A 'Labor Planning' dialog box is open, allowing users to select a parameter (BCWR, CPI, CPI 3 Month, CPI \* SPI, Custom PF, Run Rate, Current ETC, or Custom Entry) and set its 'Perf Factor' and 'Hours'. The 'Distribution Method' can be set to BAC, ACWP, or Prior ETC. The background shows a table with columns for 'Actual/ETC - Hours', 'Actual/ETC - Base', and 'Actual/ETC - Total'.

Parameter	Perf Factor	Hours	Distribution Method
<input checked="" type="radio"/> BCWR	1	220.439	<input checked="" type="radio"/> BAC
<input type="radio"/> CPI	1.628	135.571	<input type="radio"/> ACWP
<input type="radio"/> CPI 3 Month	0.37	595.781	<input type="radio"/> Prior ETC
<input type="radio"/> CPI * SPI	1.455	151.504	
<input type="radio"/> Custom PF	0	0	
<input type="radio"/> Run Rate		141.65	
<input type="radio"/> Current ETC		632.653	
<input type="radio"/> Custom Entry		0	

# Approval Utility

## Electronic approvals perform data management

Approver Workbench

Approver: THOMAS

Overview

Expand Approve

Approve EAC

Approve Actual Only

Reject

Description	CAM Name	Approval Status	Current ETC D...	New EAC	Last Month EAC	EAC Change	Revised Actuals	CAM Notes
ME.4035-01-03-01-200-LBR				\$ 1,125.09	\$ 1,188.28	-\$ 63.19	\$ 0.00	
ME.4035-01-03-01-400-LBR				\$ 1,975.74	\$ 2,153.21	-\$ 177.47	\$ 0.00	
ME.4035-01-03-02-400-MTL				\$ 0 58.19	\$ 2,115.50	-\$ 415.31	\$ 0.00	
ME.4035-01-03-03-400-MTL				\$ 11	\$ 13	\$ 2	\$ 0.00	
ME.4035-01-03-01-300-LBR				\$ 00	\$ 3,376.37	-\$ 386.37	\$ 0.00	
ME.4035-01-03-02-200-LBR				\$ 00	\$ 11,666.76	-\$ 107,118	\$ 0.00	
ME.4035-01-03-02-300-LBR				\$ 2,718.82	\$ 7,388.82	-\$ 4,670.00	\$ 0.00	
ME.4035-01-03-02-200-LBR				\$ 10,718	\$ 1,870.2	-\$ 9,847.8	\$ 0.00	
ME.4035-01-03-02-300-LBR				\$ 9,018.88	\$ 9,447	-\$ 428.12	\$ 0.00	
NWA 5189044 0010 - Rig D...		Submitted		\$ 1,080.04	\$ 3,357.38	-\$ 2,277.34	\$ 0.00	My analysis is g...
NWA 5189044 0061 - Rig D...		Program Approved		\$ 79.6	\$ 3,119.1	-\$ 3,039.5	\$ 0.00	One MILLION do...
ME.4035-01-03-07-200-LBR				\$ 33.35	\$ 1,119.39	-\$ 1,086.04	\$ 0.00	
ME.4035-01-03-07-300-LBR				\$ 34.59	\$ 1,011.1	-\$ 976.51	\$ 0.00	
ME.4035-01-03-07-400-MTL			04/03/2014	\$ 0	\$ 1,911.1	-\$ 1,911.1	\$ 0.00	
NWA 5189047 0010 - HPC...		Program Approved	04/03/2014	\$ 0	\$ 1,910.1	-\$ 1,910.1	\$ 0.00	
ME.4035-01-03-09-200-LBR				\$ 1,017	\$ 5,194.1	-\$ 4,177.1	\$ 0.00	
ME.4035-01-03-01-450-LBR			02/02/2015	\$ 0	\$ 2,572.3	-\$ 2,572.3	\$ 0.00	
ME.4035-01-03-01-250-LBR			01/02/2014	\$ 5.7	\$ 113,114	-\$ 107,408.3	\$ 0.00	
ME.4035-01-03-01-350-LBR			03/03/2014	\$ 0	\$ 212,134	-\$ 212,134	\$ 0.00	
ME.4035-01-03-07-250-LBR			01/21/2014	\$ 1	\$ 101,137	-\$ 101,136	\$ 0.00	
ME.4035 UNASSIGNED			01/21/2014	\$ 3	\$ 11,531.5	-\$ 11,528.5	\$ 0.00	
ME.4035.01.02			01/02/2014	\$ 4,431	\$ 1,115.14	-\$ 3,315.86	\$ 0.00	
ME.4035.01.04				\$ 3,711	\$ 2,251.1	-\$ 1,460	\$ 0.00	
ME.4035.01.05				\$ 3,403.15	\$ 1,115.14	-\$ 2,288.01	\$ 0.00	

# Reporting Utility

Integrated and pre-filtered

The screenshot displays the CAM EAC Workbench interface. The top navigation bar includes 'Approver Workbench' and 'CAM EAC Workbench'. The main content area shows a summary of the work package, including 'Control Account: ME.4035-01-14-05-250-LBR Work Package: NVIA 5168304 0010'. A 'Web Links' menu is visible, containing links to 'CAM Editor', 'Approver Workbench', 'EVMS Reporting', and 'Labor Reports'. A red arrow points from the 'EVMS Reporting' link to a separate window titled 'EVMS Reporting - Windows Internet Explorer provided by CSC for United Technologies Corp'. This window displays a 'Primavera - BAC v. CUM Steps' report. The report includes a table with columns for Project, ME, Start Date, WorkPackage, WorkPackageDesc, EVType, TaskStatus, BAC, Weight, and Delta. The table lists various work packages and their associated costs and weights.

Project	ME	Start Date	WorkPackage	WorkPackageDesc	EVType	TaskStatus	BAC	Weight	Delta
ME.3728	2014-04-03	ME.3728-01-08-05-A00-704-5153649-0250		POC	Not Started	105,068	105,068	0	
ME.3728	2014-04-07	ME.3728-01-01-19-MRD-M2R-5153872-0150		POC	Not Started	17,071	17,345	274	
ME.3728	2014-04-08	ME.3728-01-08-05-A00-704-5153649-0140		POC	Not Started	134,798	134,798	1	
ME.3728	2014-05-17	ME.3728-01-05-02-830-186-5153573-0050		POC	Not Started	299,998	299,999	1	
ME.3728	2014-03-04	ME.3728-01-09-10-A01-300-5165069-0120		POC	Not Started	9,893	9,893	0	
ME.3728	2014-03-08	ME.3728-01-08-09-A00-740-5152995-0280		POC	Not Started	25,000	0	25,000	
ME.3728	2014-04-01	ME.3728-01-08-10-A00-637-5152999-0620		POC	Not Started	30,000	5	29,995	
ME.3728	2014-05-01	ME.3728-06-02-01-817-R7C-5153574-0721		POC	Not Started	607,074	0	607,074	
ME.3728	2014-03-09	ME.3728-01-13-02-822-002-5152798-0784		POC	Not Started	82,000	0	82,000	
ME.3728	2014-05-30	ME.3728-04-01-02-NRD-300-5152956-0123		POC	Not Started	10,469	0	10,469	
ME.3728	2014-03-04	ME.3728-01-05-07-A00-M48-5153795-0130		POC	Not Started	5,328	0	5,328	
ME.3728	2014-03-08	ME.3728-01-03-09-NRL-ICB-5180183-0404		POC	Not Started	61,976	8	61,968	
ME.3728	2014-04-01	ME.3728-01-08-04-MCH-M7L-5171874-0170		POC	Not Started	10,000	0	10,000	

# Key Takeaways

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## Significant Business Improvements:

- Sales forecast – Amount and timing
- Manpower forecast – Tied to affordability
- Funding forecast – Accuracy for gated government funding
- EVMS compliance – Meets or exceeds requirements

## Lessons Learned:

- The human interface is vitally important - User focused design
- System Integration is of extremely high value
- Maximize real time costing, processing and reporting
- Use analytics to drive focus
- Leverage technology to ease workload
- Final answer is CAM generated, not system generated
- Stress test the system
- Tailored user experience