STEEM Update:

Portfolio Management with STEEM over the web

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Abstract

Did you know that you can use ACEIT and the web for portfolio management? Portfolio management organizes a series of projects into a single portfolio providing insight into overall costs, time lines, resources, risks, and other critical factors. This allows executives to regularly review entire portfolios, spread resources appropriately and adjust projects to produce the highest overall returns and enables program offices to gain control of their projects and deliver meaningful value to the overall organization. Implementing portfolio management provides immediate values; you and your management can

- Balance required funding to available budget by adjusting system/component quantities,
- Assess impacts of adding new systems, resource sharing, parts, and warehousing,
- Manage within your available budget which includes O&S, Military Personnel, Development, Production, etc, and
- View program-level impacts across a broad range of system components.

A collection of ACE estimates can provide the project cost information to use in portfolio analyzes. An estimate library can be made available for managers to select from and perform management analyses through a web browser. This allows the manager to work with ACE session results without ACEIT experience or training.

System Trade Economic Effectiveness Model, STEEM was developed to provide initial Excel based capability. Recently, the Excel based tool was migrated over to a browser based web tool providing several advantages. This presentation will demonstrate STEEM on the web. It will discuss the basic building blocks that make portfolio analysis over the web possible. You will see what the browser looks like, how users interact with it, and learn about the benefits it can provide to your user base.

Presentation Outline

- STEEM Background
- STEEM Capabilities
- Key Concepts Employed in STEEM

STEEM Overview

What is Portfolio Management?

- **Portfolio management organizes a series of projects into a single portfolio providing insight into overall costs, time lines, resources, risks, and other critical factors**
  - Allows executives to regularly review entire portfolios, spread resources appropriately and adjust projects to produce the highest overall returns
  - Enables program offices to gain control of their projects and deliver meaningful value to the business
- **Program office portfolios can be managed like a financial portfolio; riskier strategic investments (high-growth stocks) are balanced with more conservative investments (cash funds), and the mix is constantly monitored to assess which projects are on track, which need help and which should be shut down**
  - Critical when overseeing several programs
  - Enables visibility into the overall project/program mix to ensure that key projects are not squeezed by those with less overall value
- **Implementing portfolio management provides immediate value**
  - Balance required funding to available budget by adjusting system/component quantities
  - Assess impacts of adding new systems, resource sharing, parts, and warehousing
  - Manage within your available budget which includes O&S, Military Personnel, Development, Production, etc
  - View program-level impacts across a broad range of system components

STEEM Background

- **Background: In September 2003, DAPR-FDA recognized the need for an estimating tool that enables rapid Army-level cost, quantity, and funding trades, that has validated underlying models, that produces reliable, high-resolution estimates with reproducible results, and that allows affordability assessments.**
- **System Trade Economic Effectiveness Model**
  - Supports rapid **procurement** budget, cost, and quantity drills across multiple programs or within one program
  - Uses ACEIT-based Program Office Estimates, Army Cost Positions, and Weapon System Review Estimates
  - Web based model supporting user-friendly, top-level System of System (***portfolio***) analysis
- **Evolution**
  - 2003 - 2005: STEEM Prototype – layered application on ACE Executive
  - 2006 - 2007: Layered application on POST
  - 2007 - 2008: Browser-based, web-centric solution

Typical STEEM Analysis

- **Our portfolio consists of four aircraft systems (called Components)**

Small Cargo Plane

Medium Cargo Plane

Medium UAV

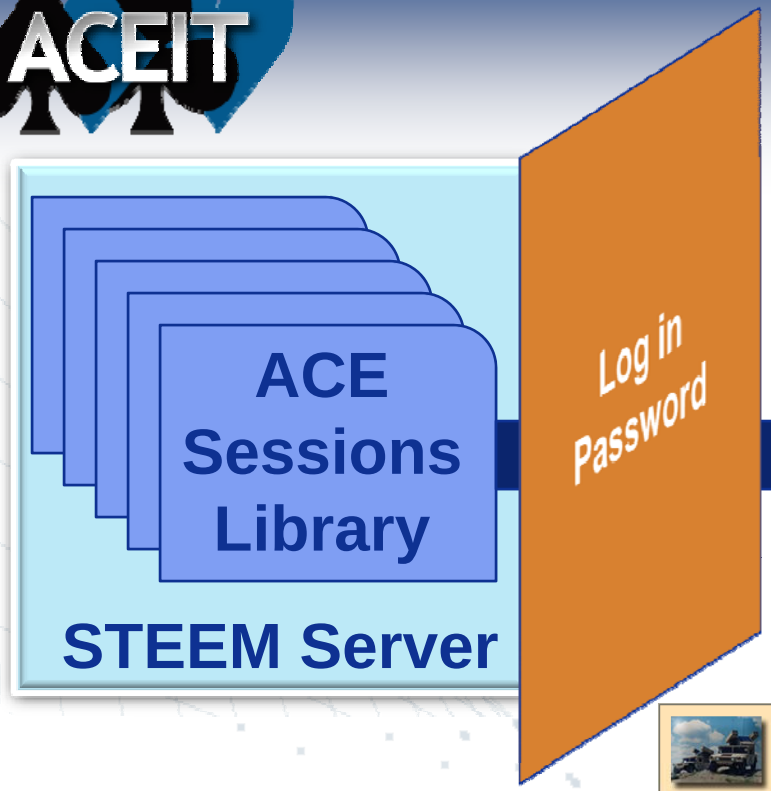
Large UAV

- **For our analysis we will look at the following:**
  - What is the portfolio scenario cost estimate?
    - Look at different purchase schedules for each component in the scenario
  - How does my portfolio budget compare to the scenario cost estimate?
    - Is the estimate for my set quantities above or below budget
  - If I have a set portfolio budget, how many component units can I purchase?
    - If I get a 10% budget cut how does that effect my quantities
- **We have ACE sessions to estimate each component.**

Benefits of a Web Solution

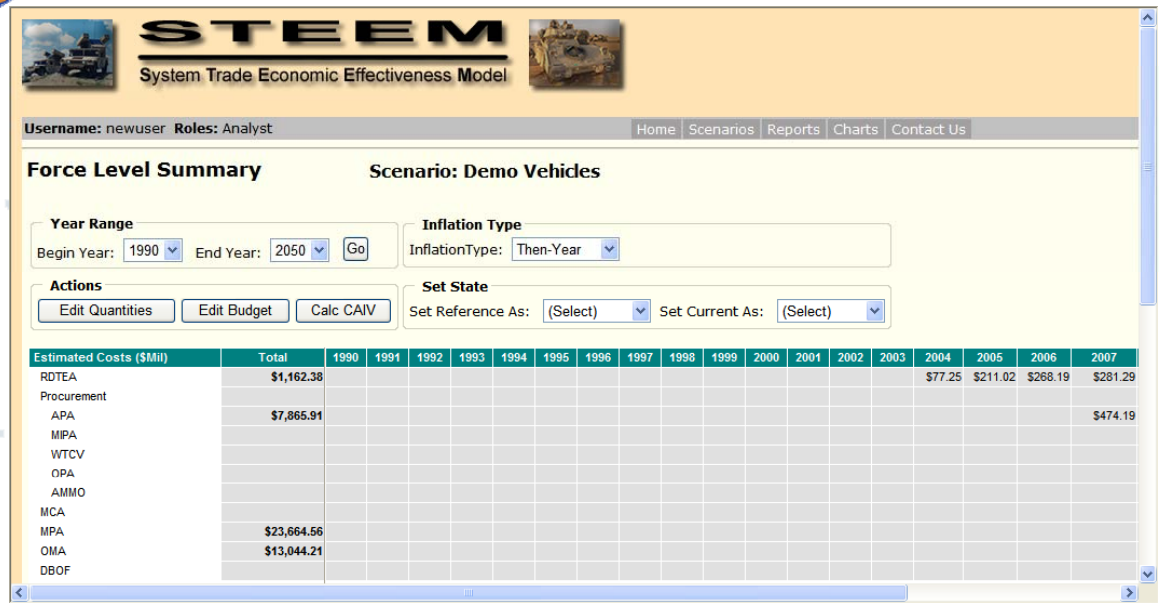
- **Rapid software updates with easy deployment to users**
  - Maintain estimate library on server
    - No need to copy library to user machines
    - New models can be provided with no impact on users
    - Could allow programs to “submit model” updates directly
  - Software updates without impact on user (no client machine impact)
- **Supports multiple users with shared budget drills**
  - Secure multi-user access
    - Can support digital certificates and CAC access
    - Role-based: e.g., Administrator, Analyst, etc.
    - Could be organized around workgroups
  - Estimates can be published and shared with other users
- **Minimal training, no ACEIT experience or training required**

STEEM Architecture



Select sessions from the library for a portfolio scenario analysis via a web browser

- **STEEM is accessed via the web**
- **STEEM offers different types of access for different groups of users**



STEEM Capabilities

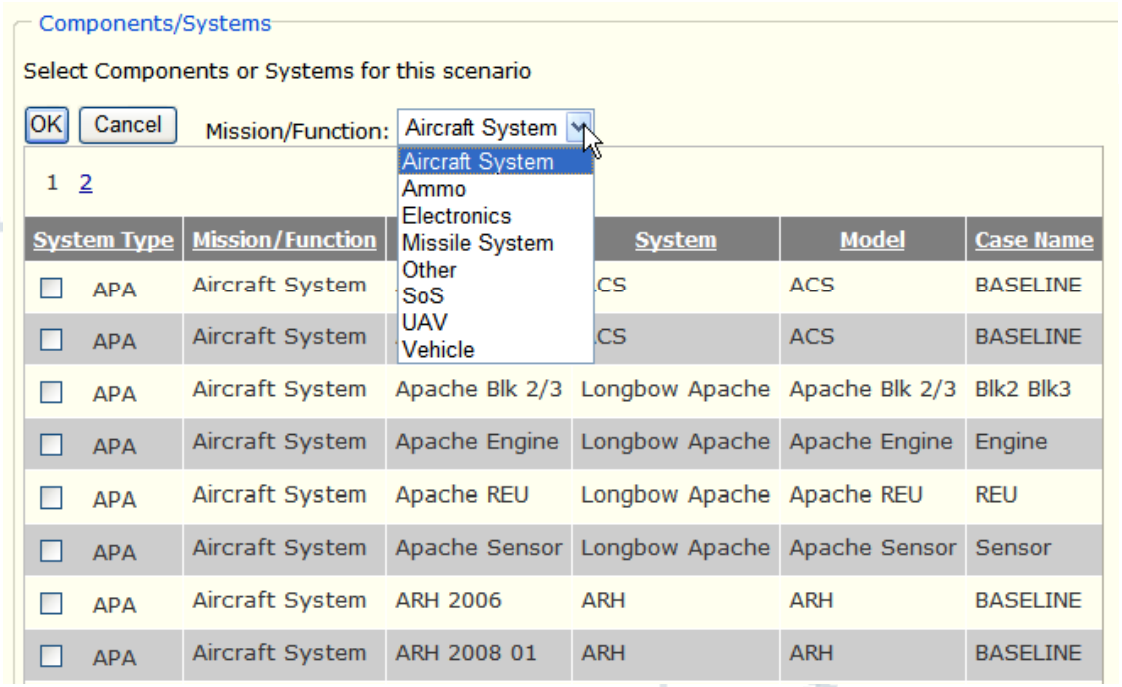
General Operations

- **Define and Create a Scenario**

- **Analyzing the Scenario - There are three main types of analysis that you can do with STEEM**
  - **Quantity analysis – allows you to change the number of quantities for each component in the scenario and calculate a new scenario cost estimate**
  - **Budget analysis – allows you to enter a new budget for the scenario or the components in the scenario and compare the new budget to the scenario estimate**
  - **CAIV analysis – allows you to perform a cost as an independent variable analysis to see how many model units you can procured given a set budget for the scenario or individual components**

Define the Scenario

- **What is a scenario?**
  - A scenario is a system trade space analysis
  - Each scenario is made up of two or more components/systems
  - The models for the components/systems are picked from the STEEM model library



  - Each scenario is saved in a scenario library on the web server so that you or your group can access it again later to continue or review the analysis

Creating a Scenario

-Enter a name for your scenario
-This name is used in the scenarios list

-Base Year for scenario analysis and results

-Check to share scenarios with other users
-Uncheck to keep the scenario private

Components/Systems

Add/Edit Components | Remove All Components

Appropriation	Mission/Function	Common Name	System	Model	Case Name
APA	Aircraft System	Medium Cargo Helicopter	Medium Cargo Helicopter	Medium Cargo Helicopter	Medium Cargo Helicopter
APA	Aircraft System	Small Cargo Helicopter	Small Cargo Helicopter	Small Cargo Helicopter	Small Cargo Helicopter
APA	UAV	Large UAV	Large UAV	Large UAV	Large UAV
APA	UAV	Medium UAV	Medium UAV	Medium UAV	Medium UAV

Force Level Summary Shows the Overall Scenario

- View scenario summary
- Sheet includes five sections

Force Level Summary **Scenario: UAVs**

Year Range Begin Year: 2004 End Year: 2014 Go

Inflation Type InflationType: Then-Year

Actions Edit Quantities | Edit Budget | Calc CAIV

Set State Set Reference As: (Select) Set Current As: (Select)

Estimated Costs ($Mil)	Total	2004	2005	2006	2007	2008	2009	2010	2011
RDTEA	$503.40	$16.91	$49.50	$83.80	$120.64	$112.79	$73.73	$44.42	$1.62
Procurement									
APA	$2,098.46				$39.40	$113.08	$520.95	$459.44	$439.00
MIPA									
WTCV									
OPA									
AMMO									
MCA									
MPA	$681.61						$1.82	$10.54	$70.72
OMA	$610.33						$2.70	$14.85	$93.34
DBOF									

Estimated Costs - Shows a summary by appropriation for all the components

Budget ($Mil)	Total	2004	2005	2006	2007	2008	2009	2010	2011
Total	$2,098.46				$39.40	$113.08	$520.95	$459.44	$439.00
Medium UAV	$916.98						$219.02	$184.02	$175.62
Small UAV	$1,181.48				$39.40	$113.08	$301.93	$275.41	$263.38

Budget - shows the budget rows for each component

Production Quantities By WS	Total	2004	2005	2006	2007	2008	2009	2010	2011
Medium UAV	250						50	50	50
Small UAV	400				5	25	100	100	100

Production Quantities – shows production quantities for the components

Estimated Costs ($Mil)	Total	2004	2005	2006	2007	2008	2009	2010	2011
Total	$2,098.46				$39.40	$113.08	$520.95	$459.44	$439.00
Medium UAV	$916.98						$219.02	$184.02	$175.62
Small UAV	$1,181.48				$39.40	$113.08	$301.93	$275.41	$263.38

Estimated Costs - shows the quantity driven procurement cost total for each component

Unit Procurement Cost ($K)	Total	2004	2005	2006	2007	2008	2009	2010	2011
Medium UAV	$3,667.94						$4,380.40	$3,680.49	$3,512.49
Small UAV	$2,953.70				$7,879.13	$4,523.26	$3,019.30	$2,754.12	$2,633.79

Unit Procurement Costs - shows the average unit cost for each component

Basic Quantity Analysis

- Enter different quantity schedules for each component
- Calculate new scenario cost estimates

Force Level Summary **Scenario: Demo Vehicles**

Year Range Begin Year: 2005 End Year: 2022 Go

Inflation Type InflationType: Then-Year

Actions Calculate Cancel

Set State Set Reference As: (Select) Set Current As: (Select)

Budget ($Mil)	Total	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Total	$7,865.91	$474.19	$436.93	$866.23	$797.07	$772.42	$532.00	$525.11	$404.15	$402.18	$335.64	$383.65
Medium Cargo Helicopter	$5,172.52	$153.97	$164.88	$330.86	$309.36	$299.30	$293.76	$290.65	$337.92	$336.19	$335.64	$383.65
Small Cargo Helicopter	$1,239.80	$293.73	$248.24	$237.82	$231.69	$228.32						
Large UAV	$536.61	$26.48	$23.81	$78.53	$72.01	$69.19	$67.64	$66.74	$66.23	$65.99		
Medium UAV	$916.98			$219.02	$184.02	$175.62	$170.60	$167.72				

Production Quantities By WS	Total	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Medium Cargo Helicopter	885	15	20	50	50	50	50	50	60	60	60	70
Small Cargo Helicopter	250	50	50	50	50	50						
Large UAV	74	2	2	10	10	10	10	10	10	10		
Medium UAV	250			50	50	50	50	50				

Estimated Costs ($Mil)	Total	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Total	$7,865.91	$474.19	$436.93	$866.23	$797.07	$772.42	$532.00	$525.11	$404.15	$402.18	$335.64	$383.65
Medium Cargo Helicopter	$5,172.52	$153.97	$164.88	$330.86	$309.36	$299.30	$293.76	$290.65	$337.92	$336.19	$335.64	$383.65
Small Cargo Helicopter	$1,239.80	$293.73	$248.24	$237.82	$231.69	$228.32						
Large UAV	$536.61	$26.48	$23.81	$78.53	$72.01	$69.19	$67.64	$66.74	$66.23	$65.99		
Medium UAV	$916.98			$219.02	$184.02	$175.62	$170.60	$167.72				

New quantity input sections

Enter new yearly quantities

Quantity Inputs	Total	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Medium Cargo Helicopter	885	15	20	50	50	50	50	50	60	60	60	70
Small Cargo Helicopter	250	50	50	50	50	50						
Large UAV	74	2	2	10	10	10	10	10	10	10		
Medium UAV	250			50	50	50	50	50				

Enter New Quantities

A common quantity drill is to slip or remove the first year's planned quantities

Enter new quantities

- Type new quantities in each fiscal year

Quantity Inputs	Total	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Medium Cargo Helicopter	885	0	20	50	50	50	50	50	60	60	60	70
Small Cargo Helicopter	250	0	50	50	50	50						
Large UAV	74	0	2	10	10					10		
Medium UAV	250			50	50							

Type directly in cells

Results View

Estimated Costs ($Mil)	Total	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
RDTEA	$1,178.05	$308.83	$303.30	$204.01	$49.18	$1.62						
Procurement												
APA	$7,554.77	$2.23	$519.33	$895.44	$814.88	$784.64	$535.40	$527.79	$406.65	$404.25	$337.18	$385.18
MIPA												
WTCV												

Result - Zero units in 2007

Production Quantities By WS	Total	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Medium Cargo Helicopter	870		20	50	50	50	50	50	60	60	60	70
Small Cargo Helicopter	200		50	50	50	50						
Large UAV	72		2	10	10	10	10	10	10	10		
Medium UAV	250			50	50	50	50	50				

2007 Costs reduced to fixed costs only

Estimated Costs ($Mil)	Total	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Total	$7,554.77	$2.23	$519.33	$895.44	$814.88	$784.64	$535.40	$527.79	$406.65	$404.25	$337.18	$385.18
Medium Cargo Helicopter	$5,087.24		$193.58	$342.78	$315.66	$303.30	$296.69	$292.96	$340.10	$338.00	$337.18	$385.18
Small Cargo Helicopter	$1,029.69		$299.02	$252.71	$242.10	$235.86						
Large UAV	$520.86	$2.23	$26.73	$80.92	$73.10	$69.85	$68.12	$67.11	$66.54	$66.25		
Medium UAV	$916.98			$219.02	$184.02	$175.62	$170.60	$167.72				

Other Quantity Drills

- **There are various types of quantity drills that can be performed**
  - Model quantity reduction
    - Yearly quantities cut across the board for all components in the scenario
  - Model quantity increase to meet new brigade requirements
    - Yearly quantities increased across the board for all components in the scenario
  - Quantities shifted from one component to another
    - Yearly quantities are decreased in one component and increased in another
  - Cut one of the components out of the beginning of the scenario
    - Small Cargo Helicopter quantities cut in the first three years

Budget Analysis

Force Level Summary **Scenario: Demo Vehicles**

Year Range Begin Year: 2005 End Year: 2022 Go

Inflation Type InflationType: Then-Year

Actions Save Budget | Prorate | Cancel

Set State Set Reference As: (Select)

Budget ($Mil)	Total	2007	2008	2009	20
Total	$7,865.91	$474.19	$436.93	$866.23	$
Medium Cargo Helicopter	$5,172.52	$153.97	$164.88	$330.86	$
Small Cargo Helicopter	$1,239.80	$293.73	$248.24	$237.82	$
Large UAV	$536.61	$26.48	$23.81	$78.53	
Medium UAV	$916.98			$219.02	$

- **Budgets are analyzed yearly at the component level**
- **Budgets can be entered for the total scenario and then need to be prorated to the components**
- **There are three ways to enter a new budget**
  - Enter a new total scenario budget as a percentage of the existing total scenario budget for each year
  - Enter a new total scenario budget for each year
  - Enter new component budget(s) for each year

Production Quantities By WS	Total	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Medium Cargo Helicopter	885	15	20	50								
Small Cargo Helicopter	250	50	50	50								
Large UAV	74	2	2	10								
Medium UAV	250			50								

A common budget analysis scenario is to look at the impact of cutting the scenarios budget by 10% annually

Estimated Costs ($Mil)	Total	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Total	$7,865.91	$474.19	$436.93	$866.23	$797.07	$772.42	$532.00	$				
Medium Cargo Helicopter	$5,172.52	$153.97	$164.88	$330.86	$309.36	$299.30	$293.7	$				
Small Cargo Helicopter	$1,239.80	$293.73	$248.24	$237.82	$231.69	$228.32						
Large UAV	$536.61	$26.48	$23.81	$78.53	$72.01	$69.19	$67.64					
Medium UAV	$916.98			$219.02	$184.02	$175.62	$170.60	$				

Enter 90 in each year to cut the budget by 10%

New Budget Values	Protect	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Budget(%)		90	90	90	90	90	90	90	90	90	90	90
Budget($)												
Medium Cargo Helicopter	..											
Small Cargo Helicopter	..											
Large UAV	..											
Medium UAV	..											

Prorating a Scenario Budget Down to the Components

- **After new scenario budgets are entered for each fiscal year the scenario budget must be prorated down to the components within the scenario**
- **All component budgets are cut by 10%**

New Budget Values	Protect	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Budget(%)												
Budget($)												
Medium Cargo Helicopter	..	$138.57	$148.39	$297.77	$278.42	$269.37	$264.38	$261.58	$304.13	$302.57	$302.07	$345.29
Small Cargo Helicopter	..	$264.36	$223.42	$214.04	$208.52	$205.49	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Large UAV	..	$23.83	$21.43	$70.67	$64.81	$62.27	$60.87	$60.07	$59.61	$59.39	$0.00	$0.00
Medium UAV	..	$0.00	$0.00	$197.12	$165.62	$158.06	$153.54	$150.95	$0.00	$0.00	$0.00	$0.00

New component budgets are 10% lower

- **Protecting a Component during Proration**
  - In some scenario situations the proration should excluded one or more components in the scenario.
  - Common situations for protecting a component's funding are:
    - A component is further along in the acquisition cycle and its programs budget is already approved by congress
    - A model is labeled "high profile" and all efforts are being made to limit changes to it
    - You only want budget cuts to come out of a subset of the components in the scenario

CAIV Analysis

How many units can be purchased if the portfolio budget is cut 10%

Force Level Summary **Scenario: Demo Vehicles**

- Runs the model to calculate how many units can be procured for the estimate cost to match the budget
- Answers "How much can I buy?" questions

Year Range Begin Year: 2005 End Year: 2022 Go

Inflation Type InflationType: Then-Year

Actions Edit Quantities | Edit Budget | Calc CAIV

Set State Set Reference As: (Select) Set Current As: (Select

Estimated Costs ($Mil)	Total	2007	2008	2009	2010	2011	2012					
RDTEA	$1,085.13	$281.29	$201.73	$76.85	$44.42	$1.62						
Procurement												
APA	$7,865.91	$474.19	$436.93	$866.23	$797.07	$772.42	$532.00	$525.11	$404.15	$402.18	$335.64	$383.65
MIPA												
WTCV												
OPA												
AMMO												
MCA												
MPA	$6,566.46			$17.57	$50.45	$122.93	$211.22	$306.57	$397.10	$478.43	$534.43	$595.39
OMA	$4,406.12			$25.24	$52.82	$116.67	$172.95	$225.07	$262.36	$322.93	$358.24	$390.36
DBOF												

Current estimate for the units in each component

New 10% budget cut

Budget ($Mil)	Total	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Total	$7,079.32	$426.76	$393.24	$779.60	$717.37	$695.19	$478.79	$472.60	$363.74	$361.96	$302.07	$345.29
Medium Cargo Helicopter	$4,655.25	$138.57	$148.39	$297.77	$278.42	$269.37	$264.38	$261.58	$304.13	$302.57	$302.07	$345.29
Small Cargo Helicopter	$1,115.83	$264.36	$223.42	$214.04	$208.52	$205.49						
Large UAV	$482.95	$23.83	$21.43	$70.67	$64.81	$62.27	$60.87	$60.07	$59.61	$59.39		
Medium UAV	$825.29											

How many units can you procure with the new budget?

Production Quantities By WS	Total	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Medium Cargo Helicopter	885	15	20	50	50	50	50	50	60	60	60	70
Small Cargo Helicopter	250	50	50	50	50	50						
Large UAV	74	2	2	10	10	10	10	10	10	10		
Medium UAV	250			50	50	50	50	50				

CAIV Calculation Results

Estimated Costs ($Mil)	Total	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
RDTEA	$1,085.13	$281.29	$201.73	$76.85	$44.42	$1.62						
Procurement												
APA	$7,110.47	$432.37	$396.08	$782.14	$720.14	$697.87	$479.31	$473.07	$365.97	$364.11	$302.23	$346.99
MIPA												
WTCV												
OPA												
AMMO												
MCA												
MPA	$5,786.69			$16.98	$46.76	$111.24	$189.24	$272.48	$350.17	$420.07	$469.04	$523.76
OMA	$3,947.82											
DBOF												

Budget and Estimate as close as possible in order to procure whole units

Budget ($Mil)	Total	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Total	$7,079.32	$426.76	$393.24	$779.60	$717.37	$695.19	$478.79	$472.60	$363.74	$361.96	$302.07	$345.29
Medium Cargo Helicopter	$4,655.25	$138.57	$148.39	$297.77	$278.42	$269.37	$264.38	$261.58	$304.13	$302.57	$302.07	$345.29
Small Cargo Helicopter	$1,115.83	$264.36	$223.42	$214.04	$208.52	$205.49						
Large UAV	$482.95	$23.83	$21.43	$70.67	$64.81	$62.27	$60.87	$60.07	$59.61	$59.39		
Medium UAV	$825.29			$197.12	$165.6			$150.95				

New quantities

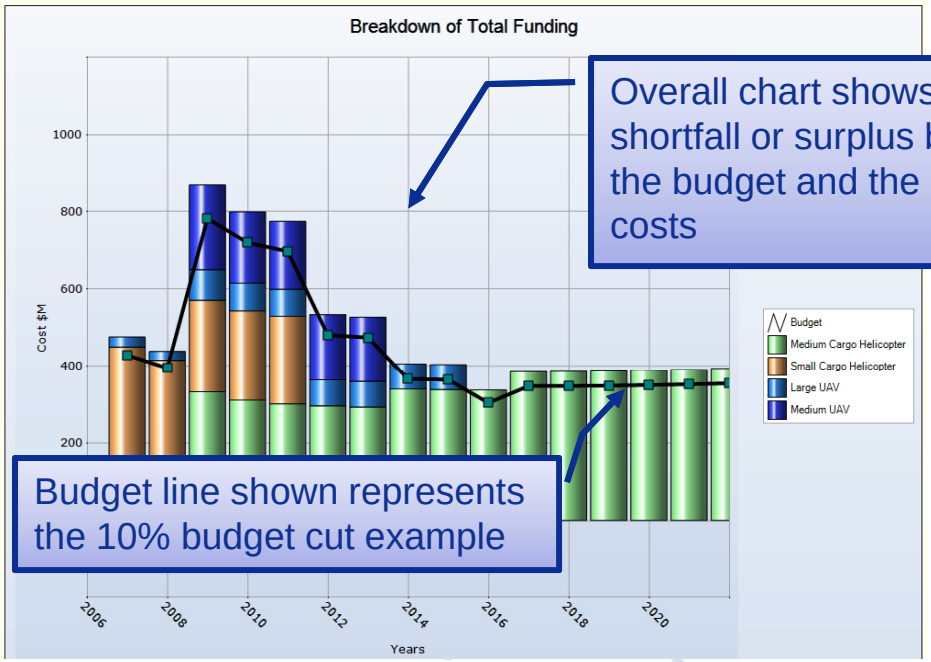
Production Quantities By WS	Total	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Medium Cargo Helicopter	767	13	17	43	43	43	43	43	52	52	52	61
Small Cargo Helicopter	220	44	44	44	44	44						
Large UAV	67	2	2	9	9	9	9	9	9	9		
Medium UAV	215			43	43	43	43	43				

New component estimates for the new quantities

Estimated Costs ($Mil)	Total	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Total	$7,110.47	$432.37	$396.08	$782.14	$720.14	$697.87	$479.31	$473.07	$365.97	$364.11	$302.23	$346.99
Medium Cargo Helicopter	$4,656.50	$138.59	$146.35	$296.54	$277.14	$268.05	$263.04	$260.21	$304.44	$302.80	$302.23	$346.99
Small Cargo Helicopter	$1,127.90	$267.30	$225.92	$216.37	$210.74	$207.64						
Large UAV	$501.25	$26.48	$23.81	$72.45	$66.73	$64.19	$62.80	$61.98	$61.53	$61.32		
Medium UAV	$824.63			$196.79	$165.54	$157.99	$153.47	$150.88				

STEEM Reports

Totals By System **Scenario: Demo Vehicles**

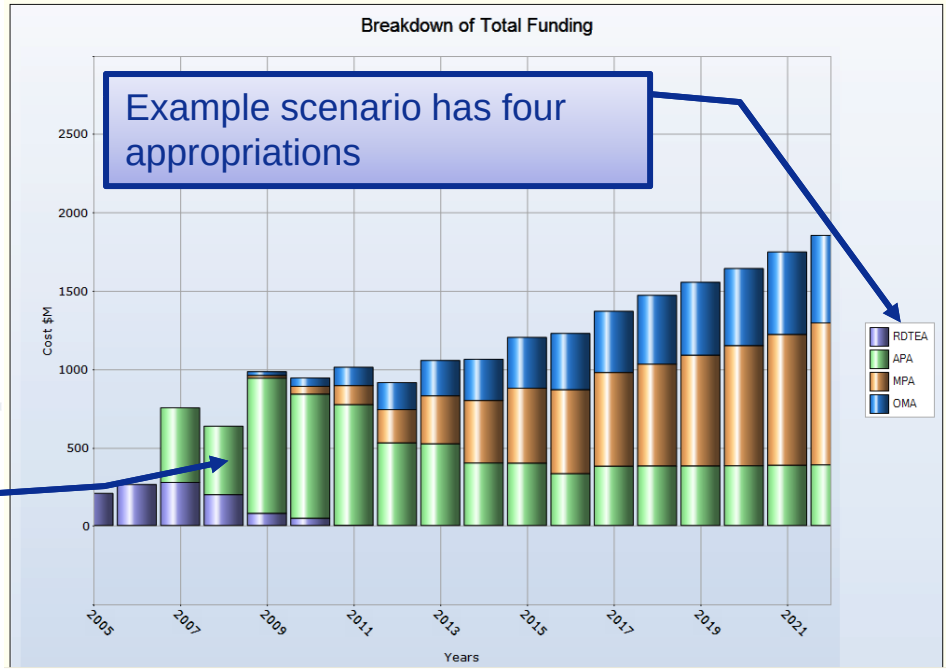


Overall chart shows the shortfall or surplus between the budget and the estimated costs

Budget line shown represents the 10% budget cut example

- **Reports offer visualization of the scenario analysis**
- **Summary reports for by system/component and appropriation**
- **Additional reports could be designed and added to the STEEM software**

Totals By Appropriation **Scenario: Demo Vehicles**



Example scenario has four appropriations

Each appropriation stacked on top of one another

Key Concepts Employed in STEEM

ACE Session Technologies

- **STEEM uses ACEIT technologies in the background**
  - ACE sessions used as estimating objects for system components, projects, or programs
  - ACEIT API allows running of ACE sessions based on input changes and the capability to retrieve and consolidate calculated costs of multiple excursions from multiple ACE models

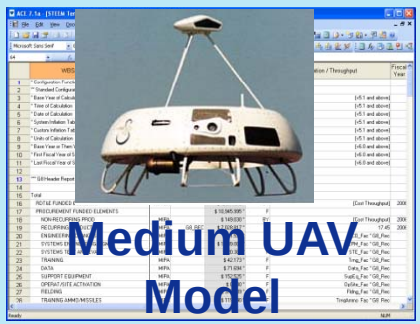
- **Each ACE session in the STEEM Library contains a set of STEEM template rows. These rows indentify items like:**
  - The top level session WBS
  - The session buy quantity
    - For sessions with multiple quantity rows logic is added to have a single quantity row feed into the true sessions quantity rows
  - Budget by Appropriation

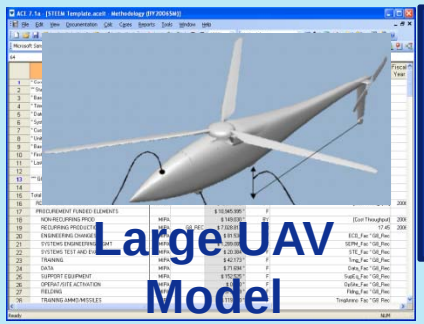
Model Architecture for the Typical STEEM Analysis

STEEM Server


Small Cargo Plane Model

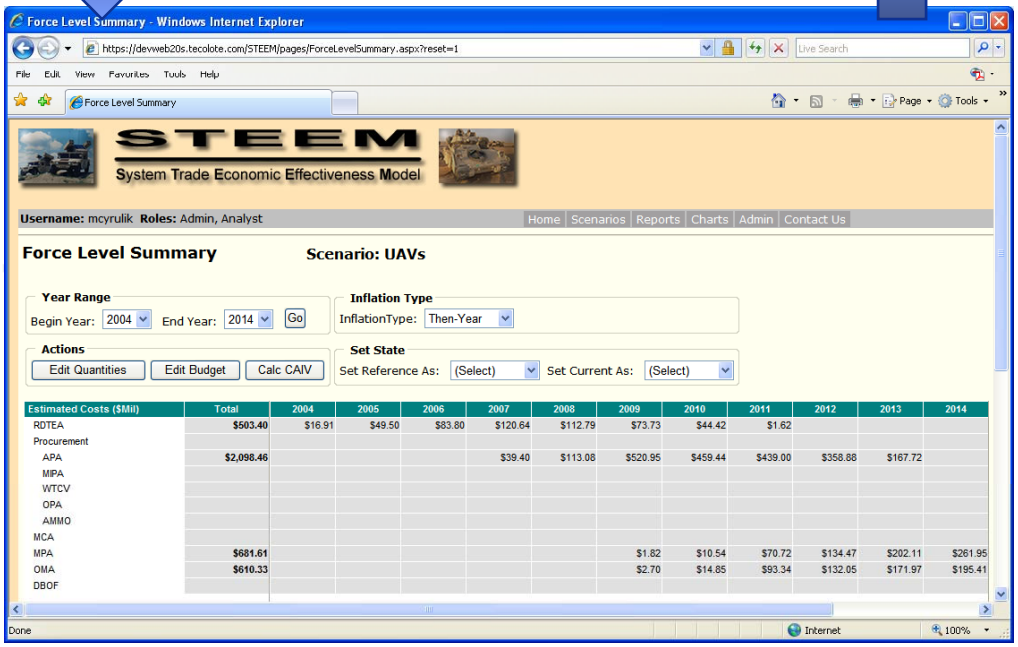

Medium Cargo Plane Model


Medium UAV Model


Large UAV Model

User Scenarios: All Scenarios stored on the server

- Users Log into server with secure passwords and/or CAC
- Generate Scenarios and Perform Analysis
- Scenarios stored on the server where analysis and results can be shared with multiple users



Conclusion

- STEEM offers a powerful combination of two technologies; a web browser powered by background ACE models.
- STEEM server offers benefits for component model access, configuration, and dissemination.
- The web browser allows STEEM to be used by a wide audience (ACE experience is not required).
- STEEM provides a solution for bringing the results of multiple ACE models together.
- STEEM is just one example of using ACE over the web. Variations can be developed for other analysis types.