



UNCLASSIFIED

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# Developing Cost Estimates for Business Transformation Projects

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# Purpose / Objectives

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**Purpose:** To discuss cost estimating techniques for business transformation projects

**Training objectives:** When the session is completed, you should understand how to

- **Work as team member (RM) to develop a cost estimate for a LSS/CPI project**
- **Categorize the types of financial benefits**
- **Access authoritative sources for key cost elements**
- **Document a cost estimate**
- **Get assistance when needed**

***Note: This guidance applies to all process improvement efforts, whether or not the LSS methodology is used.***



# Expectations

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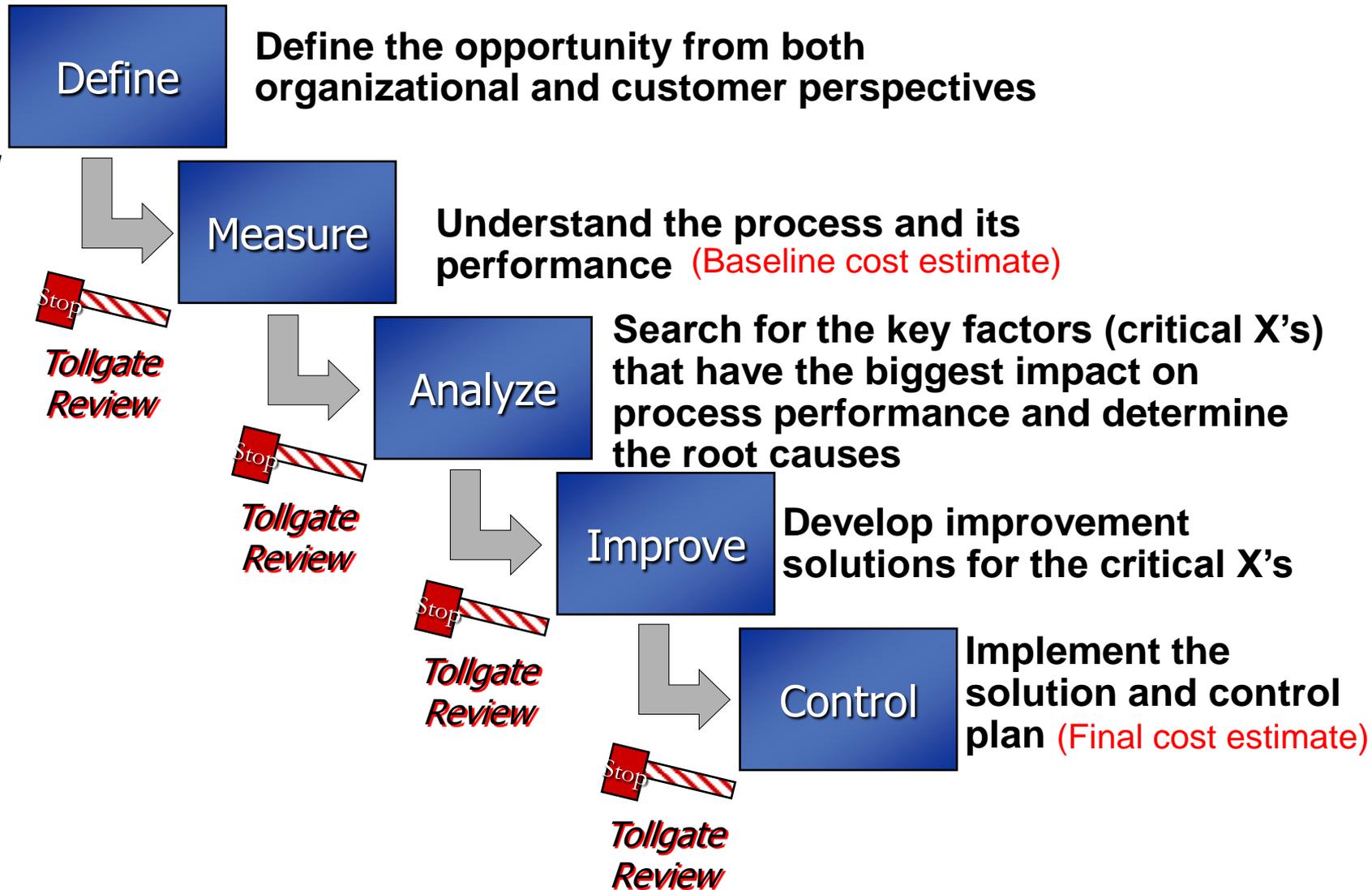
**This training is aimed at individuals who will work together on a project team to develop project cost estimates. Attendees should be familiar with ...**

- The LSS DMAIC process**
- The PowerSteering software**
- The Cost & Performance Portal  
(<https://cpp.army.mil>)**

**Shortly after completing the training, attendees are encouraged to ...**

- Experiment with PowerSteering**
- Establish user accounts on supporting websites and explore the sites**

# Lean Six Sigma Improvement Process





# Outline

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- **Role of the Resource Manager**
- **Tollgate reviews (cost estimates, financial validation)**
- **Power Steering – What, where, why, how**
- **Importance of accurate, reliable cost estimates**
- **Cost estimating guidelines**
- **What's involved in cost estimating?**
- **Authoritative resources for data**
- **Six-step cost estimating process**
- **Additional Data Required in PowerSteering**
- **Documentation and reviews of cost estimates**
- **Tips and suggestions**
- **Practical Exercise – Fort Swampy**
- **Examples - Review**



# Resource Manager

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## Definition

- **Team member who is the resource management subject matter expert**
- **Will help develop and validate financial benefits estimates resulting from CPI project**
- **Someone who is knowledgeable and/or performs resource management functions in the organization**

**Examples: Budget, Program, and Management Analysts**



# Role of the Project RM

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**Assists the project team to:**

- **Determine Project Feasibility**
- **Decide type of financial benefit that will result**
- **Develop cost estimates**
- **Identify information, data sources, and approach**
- **Monitor implementation to realize true benefits**
- **Ensure accurate cost data is entered into PowerSteering**
- **Additional data elements required in PowerSteering**
- **Enter data for multiple funding sources**
- **Document, document, document!**



# Role of the Project RM

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## As a Critical Team Member, the RM

- Should participate from project outset
- Not necessarily full-time but enough to understand process under review and how it is changing
- Must be at Kick-off and process mapping meetings and Measure and Control Tollgates
- RM must be available to work with the Project Leader when needed. If this is a problem, bump it up to the Project Sponsor and, if necessary, to the Deployment Director.



# Role of the RM at Tollgates

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## Define Tollgate

- **Develop feasibility assessment – based on charter and available information**
- **Determine if potential benefits warrant commitment of resources to Measure Phase**
- **Provide feasibility assessment to the Belt and Project Sponsor**

# Role of the RM at Tollgates

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## Measure Tollgate



- Approve baseline cost estimate
- Develop Rough Order of Magnitude (ROM) estimate of revised process and implementation costs
- Ensure “Working Estimate” is posted in PS
- Make tollgate recommendation to Project Sponsor
- Electronically approve tollgate



# Role of the RM at Tollgates

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## Analyze and Improve Tollgates

If financial estimate is revised:

- Approve any changes to “Working Estimate”
- Ensure cost estimate is complete and developed IAW guidance
- Make sure working estimate is updated in PS
- Make tollgate recommendation to Project Sponsor

# Role of the RM at Tollgates

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## Control Tollgate



- **Ensure final estimate is complete and developed IAW guidance**
- **Approve final financial benefits estimate**
- **Ensure “Final Estimate” is posted in PS**
- **Electronically approve tollgate**



# Role of the Project Leaders

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## The Sponsor and Belt

- **Sponsor appoints a resource manager (RM) to the team – Belt may suggest candidate.**
- **Belt is responsible for overall project, cost estimates, and financial reporting of the project**



# Basic Guidelines

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- **Use current dollars – also known as inflated dollars**
- **Use authoritative data sources where available**
- **Ensure apples-to-apples comparison between baseline process and revised process**
  - **Use full fiscal year costing (or complete cycle)**
  - **Use common set of cost elements**
  - **Use common unit of measure – enter whole dollars, not millions or thousands**
  - **Ensure that the baseline cost and the estimated cost address the same business process**



# Constant vs. Current Dollars

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- **Constant (uninflated) dollars must be used in comparing courses of action for decision-making purposes.**
- **Current (inflated) dollars are used to develop the POM and budget.**
- **PowerSteering data is used to generate reports on the POM and budget impact of LSS projects, therefore, data in PowerSteering must be in current dollars.**



# Dollars - Inflation

Inflation Calculator | Find US Dollar's Value from 1913-2010 - Windows Internet Explorer

http://www.usinflationcalculator.com/

File Edit View Favorites Tools Help

Inflation Calculator | Find US Dollar's Value from ...

RSS FEED COMMENTS

## US Inflation Calculator

Easily calculate how the buying power of the US dollar has changed from 1913-2010; get inflation rates, and inflation news.

HOME ABOUT INFLATION NEWS INFLATION FAQ'S INFLATION AND PRICES TERMS & PRIVACY

Search this website... GO

The US Inflation Calculator measures the buying power of the dollar over time. To begin, just enter any two dates between 1913 and 2010, an amount, and click 'Calculate'.

### Inflation Calculator

If in  (enter year)

I purchased an item for \$

then in  (enter year\*)

that same **item would cost**: **\$140.68**

Rate of inflation change: **603.4%**

\*How calculator works. Always uses latest available US government CPI data, which was updated Jan. 14, 2011. 2011 comparisons available with next US government release on Feb. 17, 2011.

### US Inflation Jumps as Consumer Prices Climb in December 2010

January 14, 2011 · Filed Under [Federal Reserve](#), [Inflation](#) · [Comment](#)

Americans paid extra for nearly everything last month as the cost of living picked up more than expected, newly released US inflation data from the government shows.

Consumer prices advanced 0.5 percent in December 2010, capping six straight monthly gains. Many forecasters were pegging an inflation rate that hovered closer around 0.4 percent. Consumer prices were up 0.1 percent in November, but back then energy prices were in check as they had risen by the smallest amount in five months.

Most items the government tracks actually ticked only modestly higher in December 2010

#### CATEGORIES

- Federal Reserve
- Inflation
- Inflation Rates
- Interest Rates
- Site Information
- Uncategorized

#### RESOURCE LINKS

- Bureau of Labor Statistics
- Reserve Monetary Policy
- Reuters Inflation News
- Silver Coins Calculators

#### ARCHIVES

- January 2011
- December 2010
- November 2010
- October 2010
- September 2010
- August 2010
- July 2010
- June 2010
- May 2010
- April 2010
- March 2010
- February 2010
- January 2010
- December 2009
- November 2009
- October 2009
- September 2009
- August 2009

#### CURRENT CPI AND INFLATION RATE

Inflation Rate **1.5%**

Consumer Price Index (CPI) **219.179**

(Released Jan. 14, 2011, for Dec. 2010)

#### BUSINESS & INFLATION: EBAY AUCTIONS

Gold to Combat Inflation

- Silver to Combat Inflation
- Your Money or Your Life Book
- Motley Fools - More Thank You Think Book
- The Millionaire Next Door Book
- The Courage to be Rich by Suze Orman Book

#### RECENT POSTS

- US Inflation Jumps as Consumer Prices Climb in December 2010
- Consumer Prices Edge Up in November 2010, Annual US Inflation Rate at 1.1%
- US Inflation Calculator and Inflation Rates Updates in November
- US Inflation Remains Tame, October 2010 Consumer Prices Rise 0.2%
- Core US Inflation Slowest in Decades, September 2010 Consumer Prices Rise 0.1%
- Fed Ready to Boost US Inflation, FOMC

Internet | Protected Mode: On 100%



# What's Involved?

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- Understanding two aspects of cost estimating
  - When the cost estimate should be developed
  - What should be included in the estimate
- Developing a thorough understanding of the process that's under review
- Identifying data sources
- Developing the estimate and documenting the rationale
- Posting data to PowerSteering



# When to Develop the Estimate?

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- **General guideline – Develop the cost estimate as soon as there is sufficient information to support the estimate**
- **Specific guidance – Two cost estimates are required for each project:**
  - **The Working Estimate is developed and entered in PowerSteering at the Measure tollgate**
  - **The Final Estimate is developed and entered in PowerSteering at the Control tollgate**

# What To Cost?

**Develop three parts to the cost estimates:**

**- Baseline process cost (recurring cost)**

*What the process will cost if we carry out existing plans but don't execute the LSS project*

**- Revised process cost (recurring cost)**

*What the process will cost as a result of the project*

**- Implementation cost (one-time, non-recurring cost)**

*What it will cost to conduct the project, redesign the process, and put the redesigned process in place*



# Why Accurate, Reliable Estimates?

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## Cost estimates will be used to:

- Identify resources that are available for use elsewhere (in the case of savings)
- Describe, for both internal and external audiences, the benefits of the Army's BT/LSS programs

## What happens if we have bad data?

- Commanders / managers will make bad resource allocation decisions
- The Army will lose credibility with important external agencies – OSD, OMB, Congress



# More Implementation Cost

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- **Implementation cost includes the following:**
  - New/improved hardware or software
  - One-time training in new procedures
  - One-time development of new policy documents
  - Building modifications, rearrangement of machinery
  - Travel costs directly related to the project
  - Contractors brought on board to support a specific project
  - Contract Termination Fee
  
- **But does not include:**
  - Deploying and managing the LSS program
  - Software used to support the program or multiple projects
  - Compensation for government personnel on the project team
  - Contractors who support the program or multiple projects



# PowerSteering Computations

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***After you enter data in PowerSteering and save your work, the software computes and displays financial benefits using these formulas:***

Baseline process cost  
- Revised process cost

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Gross savings or cost avoidance

Gross savings or cost avoidance  
- Implementation cost

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Net savings or cost avoidance



# Authoritative Resources

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- **Army-Military Civilian Cost System (AMCOS)**  
<https://www.osmisweb.army.mil/amcos/> (CAC enabled: use AKO P/W to set up account)
- **U.S. Department of State Allowance Rates**  
[http://aoprals.state.gov/Web920/allowance.asp?menu\\_id=95](http://aoprals.state.gov/Web920/allowance.asp?menu_id=95)
- **European Host Nation Employees**  
[http://www.per.hqusareur.army.mil/CPD/Pay\\_Information/Default.aspx](http://www.per.hqusareur.army.mil/CPD/Pay_Information/Default.aspx)
- **OMB Inflation Indices**  
[http://cost.tacom.army.mil/inflation\\_disc.htm](http://cost.tacom.army.mil/inflation_disc.htm)
- **President's Budget**  
<http://www.asafm.army.mil/cabsweb/reports/rates/default-staticreports.htm>
- **PowerSteering**  
Login thru AKO with CAC
- **Contract information – contact local budget or contract office**



# Personnel Costs USAREUR

## Civilian Employees:

<http://www.asafm.army.mil/cabsweb/reports/rates/default-staticreports.htm>

### Rates for President's Budget FY12 (#2617)

#### Civilian Cost Factors in support of the PB

Version 2617 reflects RMD Guidance 702 released December 2010.

Pay raise assumptions:

FY 11 - 1.4%

FY 12 - 0.0%

FY 13 and beyond - 2.3%

Foreign currency adjustments were applied according to the RMD guidance.

Oa	Roc	Ctype	RateGroup	FY 2011 Avg Wy Rate	FY 2012 Avg Wy Rate	FY 2013 Avg Wy Rate	FY 2014 Avg Wy Rate	FY 2015 Avg Wy Rate	FY 2016 Avg Wy Rate	FY 2017 Avg Wy Rate	FY 2018 Avg Wy Rate
89	***	101	1	133,422	133,890	136,191	139,323	142,527	145,809	149,169	152,600
89	***	101	3	110,227	110,614	112,514	115,102	117,750	120,461	123,236	126,071
89	***	102	3	63,260	63,698	64,433	65,915	67,431	68,979	70,565	72,188
89	***	110	1	76,311	76,578	77,894	79,686	81,518	83,395	85,317	87,279
89	***	110	3	60,509	60,721	61,764	63,185	64,638	66,126	67,650	69,206
89	***	124	3	96,278	96,615	98,275	100,535	102,848	105,215	107,640	110,116
89	***	206	3	131,221	131,681	133,943	137,024	140,176	143,403	146,708	150,082



# Rate Groups

## Definitions of OA, ROC, CTYPE and Rate Group

Definitions of *OA*, *ROC*, and *CTYPE* can be found in DFAS-IN Manual 37-100. *Rate Groups* are derived via a crosswalk from the Army's accounting structure into the following categories:

Rate Group 1 = AMHA (Army Management Headquarters Account)

Rate Group 2 = BASOPS (Base Support)

Rate Group 3 = all other (Mission and other Activities)

Beginning with the POM FY03-08, Rate Group 3 has been further parsed into:

Rate Group 4 = RDTE-Mission

Rate Group 5 = MCA-Mission

Rate Group 6 = AWCF-Mission

Rate Group 3 = Other-Mission

Questions may be addressed to: CCS Help



# Civilian Types

## Civilian Type (CTYPE) (Field 11)

The CTYPE identifies the type of civilian position associated with the Schedule 8 entry. See Table 9-6.

*Table 9-6. Civilian Type Data Element Descriptions*

CTYPE	RC	Description
101	CUDH	Graded (GS) Employees
102	CUDH	Federal Wage Grade System
105	CFDH	Koreans (Direct Hire)
110	CFDH	Other Direct Hire Foreign Nationals
121	CUDH	Senior Civilian Scale (SES/DISES/DISL/SL/ST)
124	CUDH	Military Technician – Graded (GS) Scale
125	CUDH	Military Technician – Wage Scale
130	CUDH	HQDA Interns
202	CFIH	German Nationals
204	CFIH	Korean Service Corps
205	CFIH	Japanese Master Labor Contract (MLC)
206	CFIH	Other Indirect Hire Foreign National
888	CCME	Contractor Manyear Equivalent
991	CNAF	USMA Mixed Funded Program
999	CNAF	NAF (UFM) Manpower



# Personnel Costs USAREUR

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## Example: Host Nation Employees:

- Determine pay grade and get monthly/annual wage/salary rates from CPD website:

[http://www.per.hqusareur.army.mil/CPD/Pay\\_Information/Default.aspx](http://www.per.hqusareur.army.mil/CPD/Pay_Information/Default.aspx)

- Add 30% for fringe benefits (Germany)



# Six-Step Cost Estimating Process

- 1. Determine the best cost estimating approach**
- 2. Create a repository for supporting documentation**
- 3. Determine how the business process is performed**
- 4. Categorize the financial benefit**
- 5. Develop and document the cost estimate**
- 6. Enter data in PowerSteering**



# Step 1

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## Determine Best Cost Estimating Approach

### ✓ Preferred approach:

- **Get data directly from official financial systems**
- **Unfortunately, most business processes cannot be uniquely identified in the accounting system**

### ✓ Most common approach:

- **Get data from financial and non-financial systems**
- **Use official rates and cost factors**
- **Apply your knowledge of the business process**



## Step 2

# Create Repository for Supporting Documentation

## *Why is supporting documentation needed?*

- **First and foremost: Memory is perishable ... you'll need a written document to remind yourself of the assumptions and rationale that support the estimate**
- **During implementation, if actual benefits are at variance with estimated benefits, the supporting documentation can help identify the root causes**
- **Other teams conducting similar projects can use the supporting documentation as a point of departure**
- **Internal and external reviewers can use the supporting documentation during “attestation reviews” of the financial data.**



## Step 2 Cont'd

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***Where and how do you keep supporting documentation?***

- **In PowerSteering, attach a file to the project that captures your data and your rationale.**
- **Use whatever file format works for you**
- **There is a Business Transformation workbook for this purpose. Tailor it to your project but use caution in editing cells that contain formulas or links to other cells in the file.**



# Step 2 Cont'd

## Business Transformation Financial Workbook

Yearly	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY
Name						
Cost Avoidance						
⊕ Baseline Process Cost (CA)	\$100,000	\$105,000	\$110,000	\$115,000	\$120,000	\$1
⊕ Process Cost After Improvement (CA)	\$90,000	\$94,500	\$99,000	\$103,500	\$108,000	\$1
⊕ <b>Gross Cost Avoidance</b>	\$10,000	\$10,500	\$11,000	\$11,500	\$12,000	\$1
⊕ Implementation Cost (CA)	\$10,000	\$10,000	\$0	\$0	\$0	\$0
⊕ <b>Net Cost Avoidance</b>	\$0	\$500	\$11,000	\$11,500	\$12,000	\$1
.						
Savings						
⊕ Baseline Process Cost (Sav)						
⊕ Process Cost After Improvement (Sav)						
⊕ <b>Gross Savings</b>	\$0	\$0	\$0	\$0	\$0	\$0
⊕ Implementation Cost (Sav)						
⊕ <b>Net Savings</b>	\$0	\$0	\$0	\$0	\$0	\$0
.						
Revenue Generation						
⊕ Revenue Generation After Improvement						
⊕ Baseline Revenue Generation						

## Step 3

### Determine How the Process is Performed

*Once you do this, the rest of the cost estimating process is easy*

- Describe or diagram the baseline process, using:
  - Project team and associated subject matter experts
  - Project charter
  - Value stream analysis
- For each step in the process, ask detailed questions to determine the resources involved
- Do the same for the revised process
  - Reflect phased implementation if applicable
- And do the same for implementation activities



# Sample Project Charter

## Problem/Goal Statement

**Problem:** In FY07, USAREUR disbursed \$1,283,779,679 in vendor payments and paid \$157,653 in interest penalties, an average of \$123 per million dollars disbursed. In FY08 USAREUR disbursed \$847,052,802 and paid \$184,546 in interest penalties, averaging \$218 per million dollars disbursed. At the current rate, USAREUR can expect to pay significantly more interest payment penalties in future fiscal years. The Joint Reconciliation Program (JRP) has mandated a goal of less than \$70 per one million dollars disbursed. USAREUR is not meeting this goal.

**Goal:** Reduce USAREUR vendor payment interest penalties by 70%.

## Business Impact

**Financial Benefits:** Estimated cost savings will be based on the reduction of interest penalty payments for USAREUR and operational benefits based on reduction of NVA process steps and the reduction of time associated with rework and errors.

**Financial Impact:** At current increase level, 2009 would save \$215,919. At 10% increase each year, FY 09 to FY 11, savings would be: \$714,692

- Expenses: Unknown
- Investments: None
- Revenues: TBD

## Core Team

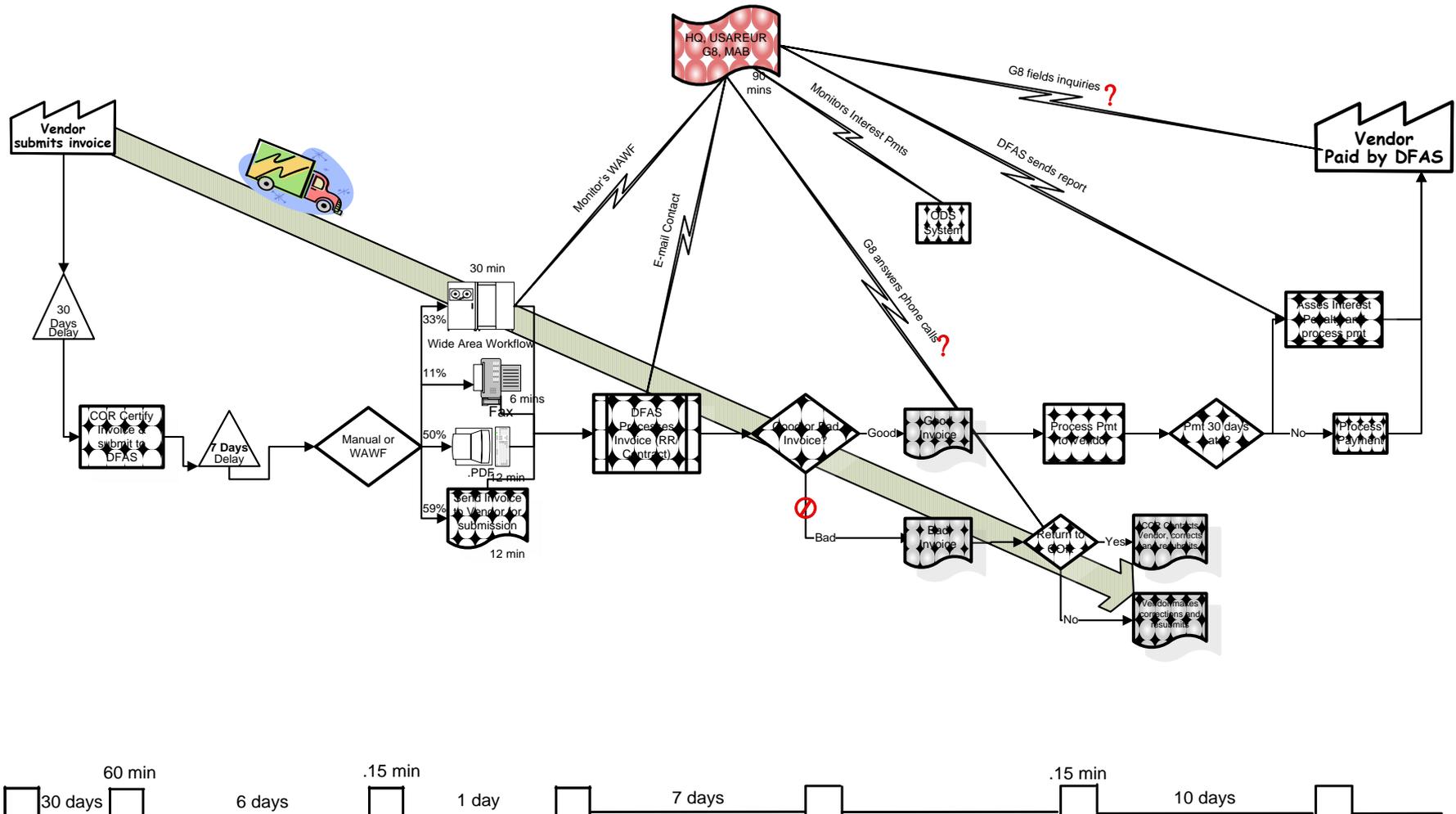
- ◆ Project Sponsor/Owner: Mr. William Staley
  - ◆ Deployment Director: Ms. Finocchiario
  - ◆ Black Belt Project Leader: Ms. Karolyn Emery
  - ◆ Master Black Belt: Ms. Angela Long/Mr. Hung Nguyen
- | Core Team          | Role        | % Contrib. | LSS Training             |
|--------------------|-------------|------------|--------------------------|
| ◆ Lynette Berdel   | RM          | 10         | AT (Awareness Training)? |
| ◆ Audrey Schneider | SME         | 30         | Not Trained              |
| ◆ Tamara Knight    | MOB/SME     | 10         | Not Trained              |
| ◆ Judy O'Conner    | COR/LOG     | 20         | Not Trained              |
| ◆ Dale Richardson  | COR/HQs     | 20         | Not Trained              |
| ◆ Steve Hooper     | COR/7/JCIS  | 20         | AT                       |
| ◆ Angie Moshhammer | Contract/IT | 15         | AT                       |
| ◆ David Hutchins   | SME/DFAS-E  | 10         | GB Trained               |
| ◆ Erik Burton      | SME/DFAS-E  | 10         | GB Trained               |
| ◆ Merline Remo     | SME/DFAS-E  | 10         | GB Trained               |
- Extended Team**
- ◆ Richard Candella SME/DFAS-R 05 BB Trained

## Tollgate Review Schedule

Tollgate	Scheduled	Revised	Complete
<b>Define:</b>	09/10/08	09/19/08	09/19/08
<b>Measure:</b>	09/26/08	11/20/08	XX/XX/08
<b>Analyze:</b>	10/03/08	XX/XX/08	XX/XX/08
<b>Improve:</b>	10/03/08	XX/XX/08	XX/XX/08
<b>Control:</b>	11/07/08	XX/XX/08	XX/XX/08

- ◆ Review high-level schedule milestones here:
  - Phase Completions
  - Tollgate Reviews
  - Trials

# Sample Value Stream Map



# Step 3 (Cont)

## Questions on the Process

**Where is the work done – what organizations/agencies are involved?**

**Address the entire process under revision**

- **Personnel Costs**

- **How many civilian and military personnel work on the process?**
- **What are their ranks and grades?**
- **What percentage of their time do they spend on the process**

- **Other Costs**

- **What is the dollar value of the contracts that support the process?**
- **What supplies and materials are used?**
- **What do we pay to repair and maintain the equipment?**
- **Does the process require unique software or other IT resources?**
- ***etc, etc, etc.***



# Step 4

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## Categorize the Financial Benefit

**Determine the type of financial benefit the project will generate**

- **Types of financial benefits**
  - **Cost reduction**
    - Savings
    - Cost avoidance
  - **Revenue generation**



# Step 4 (Cont) Financial Benefit Types

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1. **Cost Reduction\***: A reduction in the number of dollars needed to meet a customer-established requirement by executing a certain process or function

**\*All cost reductions are either savings or cost avoidance**



# Step 4 (Cont) Financial Benefit Types

- **Savings:** Cost reductions that enable a manager to remove programmed or budgeted funds and apply them to other uses
- **Cost avoidance:** All cost reductions that are not savings

- ❑ ***Savings do not have to be removed ... the point is that the funding could be removed***
- ❑ ***Benefits are viewed from a process-wide perspective: an initiative that reduces costs in one organization or appropriation but increases costs elsewhere represents a financial benefit only if there is a net cost reduction***



# Step 4 (Cont) Financial Benefit Types

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## 2. Revenue generation:

**An increase in the dollars that flow into the Army, over and above appropriated funds and customer funding received through a revolving fund**



# Step 5

## Develop and Document the Cost Estimate

- **Identify appropriate cost elements**
  - **Cost elements are the things that cost money – personnel, contracts, software licenses, supplies and material, etc**
  - **Document the cost elements in a financial workbook (Excel or Word document) to make it easier for you to develop and explain the cost estimate**
- **Estimate the workload factors for the process. For example:**
  - **How many items or transactions do we handle?**
  - **What percentage of a person's time is devoted to the process?**



# Step 5 (Cont)

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- **Determine the cost of the resources**
  - **baseline, revised, and implementation**
- **Document what you do and your rationale**
  - **In some cases, the educated guesses and assumptions of subject matter experts will be the best source of data.**
  - **Documentation will enable you or someone else to explain how the assumptions and other data were used to develop the estimate.**

# Step 5 (Cont) Personnel Costs

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## Should they be Burdened?

- In all cases, include basic compensation and personnel benefits (from CEAC)
- The question: What about overhead for personnel (general supplies, facilities, etc)?
- Guidance:
  - Assume for a moment that the financial benefit is savings (as opposed to cost avoidance) and ask this question: If a decision-maker wants to take the money from the program or budget and use it elsewhere, would the support costs be available for reallocation?
  - If yes, include the support costs in the cost estimate; if no, exclude these costs.



# Step 5 (Cont) Personnel Costs

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- For example:

**Situation 1:** Five hundred people work in a cluster of buildings. A LSS project eliminates two staff positions in one building.

**Answer:** *This will have no measurable impact on facilities costs, so the personnel cost should not be burdened for facilities*

**Situation 2:** Same as situation 1, except that the project eliminates the need for all 500 positions, the buildings will be shut down, and the DPW determines that facilities costs will measurably decrease as a result

**Answer:** *The personnel costing should include a burden for facilities costs (or the reduced facilities cost can be shown as a separate cost element)*



# Step 6

## Enter Data in PowerSteering

Metric: **Financial Benefits [NEW]** [info](#)

Project Mentors: [Joseph Romito](#)

Updated: 05/18/2009 – There are no versions.

**Properties** [Edit Properties](#)

Ready for Rollup: No

Locked: No

View: [Final Est](#) • From:  • To:

Yearly	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	PROJECT TOT.
<b>Name</b>									
-									
<b>Cost Avoidance</b>									
<input type="checkbox"/> Baseline Process Cost (CA)		\$100,000	\$105,000	\$110,000	\$115,000	\$120,000	\$125,000	\$130,000	\$805,000
<input type="checkbox"/> Process Cost After Improvement (CA)		\$90,000	\$94,500	\$99,000	\$103,500	\$108,000	\$112,500	\$117,000	\$724,500
<input type="checkbox"/> <b>Gross Cost Avoidance</b>	\$0	\$10,000	\$10,500	\$11,000	\$11,500	\$12,000	\$12,500	\$13,000	\$80,500
<input type="checkbox"/> Implementation Cost (CA)		\$10,000	\$10,000	\$0	\$0	\$0	\$0	\$0	\$20,000
<input type="checkbox"/> <b>Net Cost Avoidance</b>	\$0	\$0	\$500	\$11,000	\$11,500	\$12,000	\$12,500	\$13,000	\$60,500
-									
<b>Savings</b>									
<input type="checkbox"/> Baseline Process Cost (Sav)									\$0
<input type="checkbox"/> Process Cost After Improvement (Sav)									\$0
<input type="checkbox"/> <b>Gross Savings</b>	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<input type="checkbox"/> Implementation Cost (Sav)									\$0

# Step 6 (Cont) Where Power Steering Fits

- ❑ Project cost estimates are developed outside PowerSteering – that’s the focus of this briefing.
  - ❑ Baseline process cost
  - ❑ Revised process cost
  - ❑ Implementation cost
  
- ❑ Once developed, cost data are entered into PowerSteering:
  
- ❑ PowerSteering serves as a repository for project cost data and uses the data to compute and display financial benefits.

Metric: **Financial Benefits [NEW]** [info](#) Properties [Edit Proper](#)

Project Mentors: [Joseph Romito](#) Ready for Rollup: No

Updated: 07/17/2009 – There are no versions. Locked: No

---

View: **Final Est** From: 10/01/2007 To: 09/30/2015 Go

Yearly Name	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	PROJECT TO
<b>Cost Avoidance</b>									
⊗ Baseline Process Cost (CA)		\$100,000	\$105,000						
⊗ Process Cost After Improvement (CA)		\$90,000	\$84,500						
⊗ Gross Cost Avoidance	\$0	\$10,000	\$20,500						
⊗ Implementation Cost (CA)		\$10,000	\$0,000						
⊗ Net Cost Avoidance	\$0	\$0	\$20,500						
<b>Savings</b>									
⊗ Baseline Process Cost (Sav)									
⊗ Process Cost After Improvement (Sav)									
⊗ Gross Savings	\$0	\$0	\$0						
⊗ Implementation Cost (Sav)									
⊗ Net Savings	\$0	\$0	\$0						
<b>Revenue Generation</b>									
⊗ Revenue Generation After Improvement									\$0

- User enters cost data in the rows that are not in bold font
- PowerSteering computes and displays benefits on the bold font rows

# Step 6 (Cont) Power Steering

- To enter data, click on the plus sign for the applicable row.
- This causes each of your Appropriation Types to appear on a separate row.
- Enter data in the correct sections.
- When you save your work, PowerSteering will compute and display the benefits.

View: Final Est • From: 10/01/2007 • To: 09/30/2015

Yearly	FY 2008	FY 2009	FY 2010	FY 2011
Name				
Cost Avoidance				
<input type="checkbox"/> Baseline Process Cost (CA)		\$100,000	\$105,000	\$110,000
<input type="checkbox"/> Process Cost After Improvement (CA)		\$90,000	\$94,500	\$99,000
<input type="checkbox"/> Gross Cost Avoidance	\$0	\$10,000	\$10,500	\$11,000
<input type="checkbox"/> Implementation Cost (CA)				
<input type="checkbox"/> Net Cost Avoidance				
Savings				
<input type="checkbox"/> Baseline P				

Name	FY 2008	FY 2009	FY 2010	FY 2011
Cost Avoidance				
<input type="checkbox"/> Baseline Process Cost (CA)		\$100,000	\$105,000	\$110,000
Army direct-funded appropriations		\$100,000	\$105,000	\$110,000
Non-appropriated funds				
<input type="checkbox"/> Process Cost After Improvement (CA)		\$90,000	\$94,500	\$99,000
<input type="checkbox"/> Gross Cost Avoidance	\$0	\$10,000	\$10,500	\$11,000
<input type="checkbox"/> Implementation Cost (CA)		\$10,000	\$10,000	\$0
<input type="checkbox"/> Net Cost Avoidance	\$0	\$0	\$500	\$11,000
Savings				

# Step 6 (Cont) Power Steering

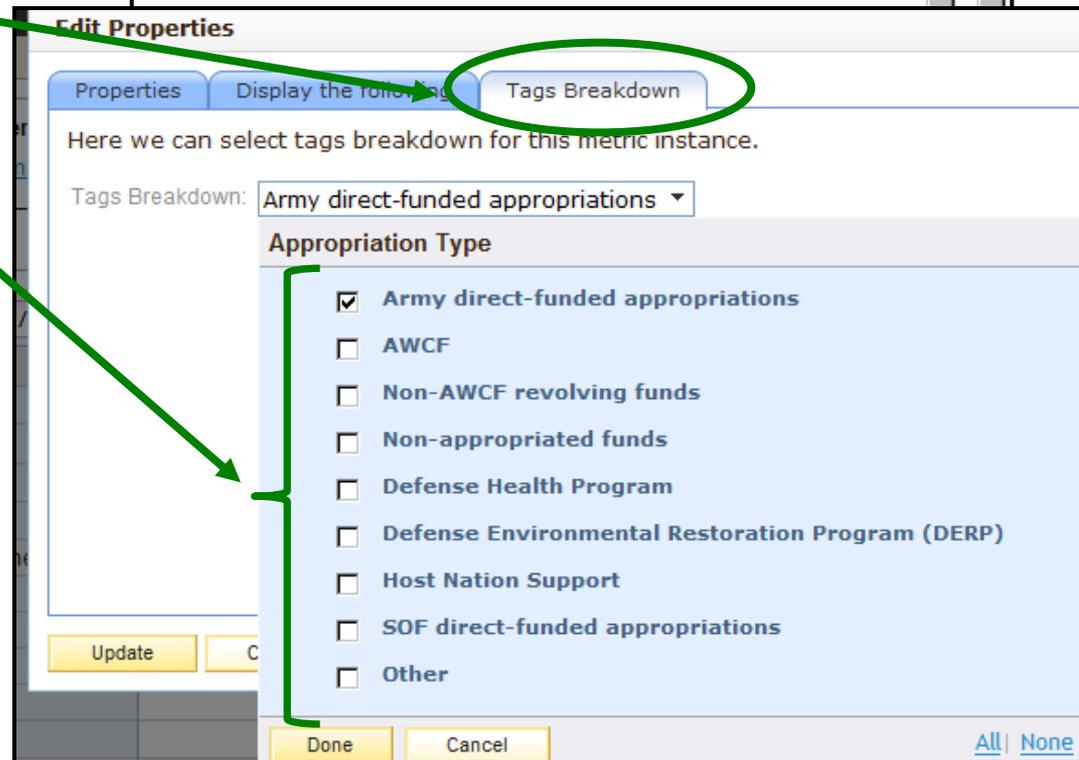
- To enter Appropriation Types:
  - First, select Edit Properties
- To enter Appropriation Types:
  - First, select Edit Properties
  - Then select Tags Breakdown
- Then select the Appropriation Types that apply to your project



**Properties**  
Ready for Rollup: No  
Locked: No

[Edit Properties](#)

	FY 2012	FY 2013	FY 2014	FY 2015	PROJECT TOT.



**Edit Properties**

Properties | Display the following | **Tags Breakdown**

Here we can select tags breakdown for this metric instance.

Tags Breakdown: Army direct-funded appropriations ▼

**Appropriation Type**

- Army direct-funded appropriations
- AWCF
- Non-AWCF revolving funds
- Non-appropriated funds
- Defense Health Program
- Defense Environmental Restoration Program (DERP)
- Host Nation Support
- SOF direct-funded appropriations
- Other

Update | Cancel

Done | Cancel

[All](#) | [None](#)

# Step 6 (Cont) Power Steering

- To enter data, click on the plus sign for the applicable row.
- This causes each of your Appropriation Types to appear on a separate row.
- Enter data in the correct sections.
- When you save your work, PowerSteering will compute and display the benefits.

View: Final Est • From: 10/01/2007 • To: 09/30/2015 Go

Yearly	FY 2008	FY 2009	FY 2010	FY 2011
<b>Cost Avoidance</b>				
<input type="checkbox"/> Baseline Process Cost (CA)		\$100,000	\$105,000	\$110,000
<input type="checkbox"/> Process Cost After Improvement (CA)		\$90,000	\$94,500	\$99,000
<input type="checkbox"/> Gross Cost Avoidance	\$0	\$10,000	\$10,500	\$11,000
<input type="checkbox"/> Implementation Cost (CA)		\$10,000	\$10,000	\$0
<input type="checkbox"/> Net Cost Avoidance	\$0	\$0	\$500	\$11,000
<b>Savings</b>				
<input type="checkbox"/> Baseline Process Cost (Sav)				

<b>Cost Avoidance</b>				
<input type="checkbox"/> Baseline Process Cost (CA)		\$100,000	\$105,000	\$110,000
Army direct-funded appropriations		\$100,000	\$105,000	\$110,000
Non-appropriated funds				
<input type="checkbox"/> Process Cost After Improvement (CA)		\$90,000	\$94,500	\$99,000
<input type="checkbox"/> Gross Cost Avoidance	\$0	\$10,000	\$10,500	\$11,000
<input type="checkbox"/> Implementation Cost (CA)		\$10,000	\$10,000	\$0
<input type="checkbox"/> Net Cost Avoidance	\$0	\$0	\$500	\$11,000
<b>Savings</b>				



# Additional Data Required in PowerSteering

## Management Decision Package (MDEP)

- Describes a particular organization, program, or function and records the resources associated with the intended output.

- Each MDEP applies uniquely to one of the **six** management areas for the Active Army, Guard, and Reserve:

- 1. Missions of Modified Table of Organization and Equipment (MTOE) units.** Links resources to the wartime mission of an org and its MTOE units. Examples include Army divisions, brigades, and corps support commands. Funds for mission-related needs such as: fuel, supplies, unit training, military manpower; can contain civilian manpower and augmentation manpower.
- 2. Missions of Table of Distribution and Allowance (TDA) units and Army-wide standard functions.** Identifies resources required to carry out the mission of a TDA organization and perform standard functions such as health care and CHAMPUS, or printing and publishing.
- 3. Missions of Standard Installation Organizations (SIOs).** Identifies resources to perform specific base operations, such as supply operations, personnel support, and operation of utility services.

# MDEP (Cont)

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4. **Acquisition, Fielding, and Sustainment of Weapon and Information Systems.** Contains resources used to develop, buy, field, or sustain new systems. Can also contain resources for research & development activities not related to specific systems.
5. **Special Visibility Programs (SVPs).** Crosses two or more management areas to define and protect resources having high-level interest. May be an issue that is the subject of a report required by Congress, OSD, or the Army leadership. Periodic review by Program Analysis & Evaluation Division (PAED) with ASA (FM), DSCOPS, and proponent agencies determines when to discontinue special visibility; then transfer to permanent management structure.
6. **Short Term Projects (STPs).** Defines and protects resources for a designated project of specified duration. May define an Army Management Review issue, base closure, force structure realignment, or other short-term project. When building POM or budget, can also define a resource programmatic adjustment over time.

**Note: Each MDEP is managed by one PEG**



# MDEP (Cont)

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## Role of MDEPs in Programming, Budgeting, & Execution

### Programming:

- Provide useful visibility
- Allow Managers, Decision-Makers, & Leaders to:
  - Assess program worth
  - Confirm compliance
  - Rank resource claimants.

### Budgeting:

- Convey approved program & priorities into budget estimates
- Assist HQDA Program Evaluation Groups post program changes caused by budget decisions & approved funding

### Execution:

- Posted MDEPs help HQDA principals, MACOM commanders and other operating agencies track program & financial performance
- Feedback helps determine future requirements

**Army Proponent for MDEP – Program Analysis and Evaluation Directorate (PAED), DSN 227-1562**

# Program Evaluation Group (PEG)

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- PEGs are HQDA-level decision-making bodies, subject to existing program and budget guidance.
- PEGs evaluate and validate requirements and make funding/trade-off decisions to determine which programs will be resourced.
- Every MDEP is managed by one PEG.
- Each PEG is co-chaired by a member of the Army Secretariat and the Army Staff. The six PEGs and their co-chairs are as follows:
  - Installations – ASA(I&E) and ACSIM
  - Training – ASA (M&RA) and G-3
  - Equipping – ASA(ALT) and G-8
  - Sustaining – ASA(ALT) and G-4
  - Organizing – ASA(M&RA) and AASA (provisional)
  - Manning – ASA(M&RA) and G-1



# Army Program Element (APE)

- Alpha-numeric code that identifies the collection of resources intended to provide a specific capability.
- Similar to MDEPs, but at a much greater level of detail.
- Designed and quantified to be both comprehensive and mutually exclusive.
- Continually scrutinized to maintain proper visibility of Army programs.
- APEs are based on the Major Force Program (MFP) structure used in the Future Years Defense Program (FYDP).



# Army Program Element (APE) (Cont)

## Major Force Programs

1. Strategic Forces
2. General Purpose Forces
3. Command, Control, Communications, & Intelligence
4. Mobility Forces
5. Guard & Reserve Forces
6. Research & Development
7. Central Supply & Maintenance
8. Training, Medical, & Other General Personnel Activities
9. Administration & Associated Activities
10. Support of Other Nations
11. Special Operations Forces



# Army Program Element (APE) (Cont)

- For most appropriations and manpower, the APE is made up of six numeric or alphanumeric characters which relate to the Army Management Structure Code (AMSCO) and the Office of the Secretary of Defense Program Element (OSDPE).
- The following appropriations have differing APE patterns:
  1. OMA – first 6 digits of AMSCO + 000
  2. Military Pay – AMSCO structure. In PROBE, a 6 digit APE plus PT; Web displays DFAS 4 digit AMSCO + APE\_PT.
  3. Military Construction Army – Budget Activity in first APE position, followed by a right-justified Congressional Project Code.



# Army Program Element (APE) (Cont)

4. **Research, Developing, Testing, & Evaluation - uses 2<sup>nd</sup> through 7<sup>th</sup> position of the Office of the Secretary of Defense Program Element (OSDPE) as the first 6 positions of the APE. Positions 7 through 9 identify the RDTE project for manpower.**
5. **Procurement appropriations - do not use AMSCO or OSDPE. The APE in PROBE reports is the Standard Study Number (SSN).**
6. **Family Housing Operations & Maintenance (AFHO) - uses the first 4 digits of the AMSCO , followed by zeros.**

**Proponent: Army Budget Office (ABO), DSN 222-5878**



# Resource Organization Code (ROC)

- Identifies the Major Army Command, subordinate commands, and separate units or activities receiving resources from HQDA.
- DA Program & Budget Guidance (PBG) and the manpower addendum is distributed based on ROC groupings.
- Requests for resource changes and reprogramming must be submitted by ROC groupings.
- ROC has two components:
  - A two-position operating agency code, used in programming, budgeting and accounting systems. (USAREUR is OA89)
  - A one-position code in position 3 identifying a subordinate activity within the operating agency. A zero (0) in this space is a summary of all ROCs within the OA.

**Proponent: OA – SAFM-BUC-E, AC: 703-614-7414; ROC Detail – MOFI-RR, DSN: 227-6978**



# **Review: 6-Step Cost Estimating Process**

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- 1. Determine the best cost estimating approach**
- 2. Create a repository for supporting documentation**
- 3. Determine how the business process is performed**
- 4. Categorize the financial benefit**
- 5. Develop and document the cost estimate**
- 6. Enter data in PowerSteering**



# Reviewing and Approving Tollgates

---

- **When the project owner requests a tollgate review, designated reviewers, to include the RM will have to log into PowerSteering to approve the action**
- **Gate approval is painless – type one word and click the mouse three times**



# Gate Approval

Home | PowerSteering 7.0 - Windows Internet Explorer  
 https://bt.army.mil/usarmycorp/Home.page  
 File Edit View Favorites Tools Help  
 Links Customize Links AKO Log In  
 U.S. Army Europe and Seven... Army Knowledge Online - hu... Home | PowerSteering 7.0



Logged in as Hung Nguyen (Log out) Help

Home Inbox (3) Browse Important Links Last Visited Search

Announcement from Army ETF LSS Helpdesk on 08/26/2009 03:36 PM  
 PowerSteering will be unavailable for maintenance on 28-Aug-09 from 1700 - 2000 EDT.  
 See www.us.army.mil/suite/page/187912 for latest PowerSteering operational status. Issues with Fiscal Year Financial Data are in progress. IE8 users: Click the Compatibility Mode button next to the address bar to use PowerSteering in IE8.

Ok

**Welcome back, Hung Nguyen**  
 Your last login was 09/02/2009 06:59 AM  
 • You have [1 question](#) in your inbox  
 • You have [2 alerts](#) in your inbox

[Find a person](#) [Create new work](#) [Run a report](#)  
[Find a project or idea](#) [Configure desktop](#)

### My Projects

Show:   Show Projects Only

1 2 3 [31 Items]

Role	Name	Status	% Complete	Due date	Location
Project Owner	<a href="#">Cost Estimating Class (TEST) Demonstration Only</a>	On Track	<input type="text"/>	01/15/2010	
	<a href="#">MANSCEN-TRADOC Instructors Resources Allocation Process</a>	Off Track	<input type="text"/>	01/30/2009	
Team Member	<a href="#">Combined Arms Training Strategy (CATS) Development Process</a>	Deferred	<input type="text"/>	03/14/2008	
Gate Approver	<a href="#">Collective Training Directorate (CTD) Task Management</a>	Deferred	<input type="text"/>	03/03/2008	
	<a href="#">Combined Arms Research Library (CARL) Civilian Awards Process</a>	Deferred	<input type="text"/>	06/11/2007	
	<a href="#">Combined Arms Training Strategy (CATS) Development Process</a>	Deferred	<input type="text"/>	03/14/2008	
	<a href="#">Command Group Evaluations Process</a>	Deferred	<input type="text"/>	06/11/2007	
	<a href="#">Cost Estimating Class (TEST) Demonstration Only</a>	On Track	<input type="text"/>	01/15/2010	
	<a href="#">Improve BOLC III Student Process Cycle Time for In-Processing</a>	Off Track	<input type="text"/>	06/30/2008	
	<a href="#">JMTC - Reduce Cost of Homestation 25m Ranges throughout USAREUR (a-B4)</a>	Deferred	<input type="text"/>	09/26/2008	
	<a href="#">MANSCEN/FLW Civilian Hiring Process Cycle Time</a>	Deferred	<input type="text"/>	03/31/2009	
	<a href="#">Reduce Interest Penalties within USAREUR</a>	Off Track	<input type="text"/>	01/30/2009	
	<a href="#">Staffing Process for CAC Weekly Update</a>	Off Track	<input type="text"/>	03/27/2008	
	<a href="#">Streamline PBD Fleet Management Process</a>	Deferred	<input type="text"/>	05/01/2008	
	<a href="#">Supply procurement and accountability</a>	Deferred	<input type="text"/>	10/31/2007	

Export: [PDF](#) | [Excel](#) | [CSV](#) | [Word](#)

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# Gate Approval

My Inbox | PowerSteering 7.0 - Windows Internet Explorer

https://bt.army.mil/usarmycorp/person/Inbox.epage?sp=0

File Edit View Favorites Tools Help

Links Customize Links AKO Log In

U.S. Army Europe and Seven... Army Knowledge Online - hu... My Inbox | PowerSteerin... X

Home Inbox (3) Browse » Important Links Last Visited Search

My Inbox

Questions (1) Alerts (2) Status Reports Due (0)

Announcement from [Army ETF LSS Helpdesk](#) on 08/26/2009 03:36 PM  
PowerSteering will be unavailable for maintenance on 28-Aug-09 from 1700 - 2000 EDT.  
See [www.us.army.mil/suite/page/187912](http://www.us.army.mil/suite/page/187912) for latest PowerSteering operational status. Issues with Fiscal Year Financial Data are in progress. IE8 users: Click the Compatibility Mode button next to the address bar to use PowerSteering in IE8.

Ok

Submit Reset

1. [Hung Nguyen](#) has requested approval of Gate [1. Define](#) in Gated Project [Cost Estimating Class \(TEST\) Demonstration Only](#) on 09/02/2009 .

Request Comments:

Approve?  Approve  Reject

Comments:

Submit Reset

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# Reviews of Financial Data

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- **Army Audit Agency will review financial and operational data for selected projects**
  - **The AAA review is not an audit, not an inspection**
  - **The review is an “attestation” review to determine whether**
    - **The estimated financial and operational benefits are reasonable and reliable**
    - **The cost estimate was developed in accordance with HQDA guidance**
    - **Supporting documentation is available to explain how the estimate was developed**
- **Commanders are encouraged to use local Internal Review staff and resource managers to review additional projects**
  - **Suggested focus:**
    - **Projects whose financial benefits will be publicized externally**
    - **Projects with savings that will be reapplied elsewhere**



# Project Review Questions

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- **Did a resource manager assist the project team?**
  - **Was the team aware of, and did it use, the published guidance?**
  - **Did the team properly apply the definitions of savings, cost avoidance, and revenue generation?**
  - **Did the team properly use the PowerSteering tabs for the projected and final estimates?**
  - **Did the team develop and maintain supporting documentation and attach the documentation to PowerSteering?**
- ✓ Does the supporting documentation adequately explain how the team developed the cost data?
  - ✓ Did the team comply with guidance on personnel costing and inflation?
  - ✓ Did the team properly identify costs by fiscal year?
  - ✓ Are the estimated financial benefits consistent with the estimated operational benefits?
  - ✓ Are the financial and operational benefits in PowerSteering reliable? If not, what is a reliable estimate?



# Recent Observations/Lessons

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- The financial management guidance applies to all process improvement work, whether it is done using LSS or some other approach.
  - Cost estimates are required for all process improvement projects.
  - Where the guidance is keyed to LSS tollgates, use your judgment in applying the guidance to your project. Try to comply with the apparent intent of the guidance.
- **A budget cut does not equate to a financial benefit. There has to be an underlying process improvement.**
- Enter cost data in the year in which the costs will be incurred.
- Enter cost data for all years from the current year through the end of the program year (the “POM period”).
- Very few process improvement efforts lead to one-time benefits. Benefits will almost always be recurring.



# Tips and Suggestions

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- For more details, read the Army Lean Six Sigma Financial Guidebook:
  - Current version (7) is at: <https://cpp.army.mil>
  - Establish an account, log in, then click on *Lean Six Sigma (LSS) Financial Guidance* in the upper left corner of the screen
  - Use the *Resources and Tools* tab to get the *Appendices* to include the *BT Financial Workbook* and a list of *Acronyms*
- Practice with the PowerSteering financial templates
- If you have questions: Send e-mail to the Help Desk at [BTFinancial@conus.army.mil](mailto:BTFinancial@conus.army.mil)
- For military, civilian, LN, and contractor personnel rates, use the AMCOS site at: <https://www.osmiswe.army.mil/amcos/>
- Subscribe to “*Resource Management Information about Business Transformation*” by sending an email to [listserv@ardalsrv01.hqda.pentagon.mil](mailto:listserv@ardalsrv01.hqda.pentagon.mil)

# Exercise

## Fort Swampy Alarm Monitoring System



- ✓ Budget Cut?
- ✓ Revenue Generation?
- ✓ Cost Avoidance?
- ✓ Cost Savings
  
- ✓ List Factors Involved





# Cost Estimating Exam

## Exercise Scenario: Fort Swampy Alarm Monitoring Systems

**Setting:** It is now 1 October 2007. The location for this project is Fort Swampy, an installation located in the Washington-Baltimore metropolitan area.

**Current Situation:** Fort Swampy has two alarm monitoring functions that are performed in a single building. The functions are located in two adjacent rooms separated by a wall. The security manager believes that the installation could save money by combining the two monitoring functions into a single operation.

One side of the facility is operated under a contract with the ABC Security Company. It costs \$150,000 in FY08. The contract has four option years, with price growth as follows: 3% per year for two years (FY09-FY10) and 4% for the following two years (FY11-FY12). After FY12, a new contract would have to be negotiated. The government may terminate the contract at any time during the year, but must pay a termination fee if this happens. The fee is \$20,000 if 9 -11 months remain on the contract, \$15,000 if 6 - 8 months remain, and \$10,000 if five or fewer months remain. The contract period of performance runs from 1 October to 30 September.

The other side of the facility is operated by three GS-3 civilian employees.

The security manager, who is a GS-11, performs functions throughout the installation. She estimates that she currently spends four hours per week (10% of her time) overseeing and supervising the monitoring facility.

The installation pays a contractor, the XYZ Maintenance Company, to perform maintenance on all alarm systems. The contract costs \$2500 in FY08. This contract has four option years, with price growth as follows: 3% per year for two years (FY09-FY10) and 4% per year for the following two years (FY11-FY12). After FY12, a new contract would have to be negotiated. If the contract is terminated at the government's request, there is no termination fee, but the government is required to pay the full annual amount on the contract.

Each year the installation buys back-up tapes and logbooks that are required under the current monitoring procedures. The cost in FY08 is \$195.

All costs are funded with OMA dollars.



# CPI/LSS Team Solution

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## Fort Swampy Alarm Monitoring Systems

An opening will be constructed in the existing wall, enabling the government employees to monitor all alarms. The alarm monitoring contract would be terminated. The employees would not require any additional training. At the same time, the personnel staffing requirement would be increased to a total of four GS-3s in order to provide better coverage of the 24/7 monitoring requirement, annual leave, etc.

The Boden Construction Company has submitted a proposal of \$50,000 to build the opening in the wall and complete the associated wiring. The company states that it can complete the project within 90 days of contract award. The installation projects that a contract can be awarded 30 days from the day a decision is made to proceed with the proposed alternative.

A new alarm monitoring system will be installed that will eliminate the need for back-up tapes and logbooks, and for the annual maintenance contract with the XYZ Maintenance Company. This system, which is built and sold by the Acme Detection System Company, will cost \$48,500, to include delivery and installation, and will require annual software updates beginning 12 months from the date of installation. The cost of the software upgrade contract in FY09 would be \$3,500. Acme has a backlog of orders and has projected that the system could be shipped and installed by 1 June 2008.

The security manager estimates that the new arrangement will reduce the amount of time she has to spend overseeing and supervising the monitoring facility to three hours per week.





# Set-Up Info

<b>Project Setup Information:</b>	<b>Entry Date:</b>	
<b>Person Constructing This Cost Estimate:</b>		
<b>Name (Last, First, Mi):</b>		
<b>Organization:</b>	Ft. Swampy Resource Mgmt Ofc	
<b>Organization Address:</b>	123 Elm St.	
<b>City:</b>	Ft. Swampy	
<b>State:</b>	Virginia	
<b>ZIP code:</b>	22222	
<b>Commercial Phone:</b>	703-555-1212	
<b>DSN:</b>	999-1212	
<b>Email Address:</b>		

<b>Resource Manager:</b>	
<b>Name (Last, First, Mi):</b>	Same as above.
<b>Organization:</b>	
<b>Organization Address:</b>	
<b>City:</b>	
<b>State:</b>	
<b>ZIP code:</b>	
<b>Commercial Phone:</b>	
<b>DSN:</b>	
<b>Email Address:</b>	





# Cost Avoidance Implementation

Projected Estimate								
FY	2008	2009	2010	2011	2012	2013	2014	
Implementation Costs (Cost Avoidance)								
<b>Total:</b>								
Projected Net Cost Avoidance (Gross Cost Avoidance - Implementation Costs):								
<b>Total:</b>								



# Savings

Savings								
FY:	2008	2009	2010	2011	2012	2013	2014	Supporting Information
<b>Baseline Process Cost (Savings):</b>								
<b>Total:</b>								
<b>Projected Process Cost After Improvement (Savings):</b>								
<b>Total:</b>								
<b>Projected Gross Savings (Baseline -Cost after Improvement Estimate):</b>								
<b>Total:</b>								
<b>Projected Implementation Cost (Savings):</b>								
<b>Total:</b>								
<b>Projected Net Savings: (Gross Savings - Implementation cost)</b>								
<b>Total Savings:</b>								



# Summary

FY:	2008	2009	2010	2011	2012	2013	2014	
Baseline Process Cost (Cost Avoidance):								
Baseline Process Cost (Savings):								
<b>Total:</b>								
Total Projected Process Cost after Improvement (Cost Avoidance + Savings)								
FY:	2008	2009	2010	2011	2012	2013	2014	
Projected Process Cost After Improvement (Cost Avoidance):								
Projected Process Cost After Improvement (Savings):								
<b>Total:</b>								
Projected Net Financial Benefits								
FY:	2008	2009	2010	2011	2012	2013	2014	
Projected Net Cost Avoidance:								
Projected Net Savings:								
Projected Net Increase In Revenue Generation:								
<b>Total Projected Net Financial Benefits:</b>								



# Staffing Costs for Exercise

http://www.amcos.osmisweb.com/app/lite/default.asp - Microsoft Internet Explorer

AMCOS Lite

Home | Data | Cost Details | Applications | FeedBack | Help | Exit

AMCOS Lite allows you to view costs for specified personnel. The costs are displayed both by individual element, and by appropriation-level aggregations for each grade and MOS.

Version: Full-Update: 1-JAN-07 Pay Tables, 2006 Inventory, FY 07 Budget Materials

Component: Civilian General Schedule      Cost Summary

Group/CMF: All Army      Default

Skill/MOS:     

Locality: Washington-Baltimore-Northern Virginia, DC-MDPA-VA-WV @ 1.1869

APPN	GS1	GS2	GS3	GS4	GS5	GS6	GS7	GS8	GS9	GS10	GS11	GS12	GS13	GS14	GS15
Amy-Funded Civilian	24,629.34	29,519.82	32,918.13	37,676.55	42,689.43	48,854.51	52,980.58	61,357.24	64,949.87	74,772.19	79,689.72	96,345.75	115,375.48	136,325.69	163,360.52
Gov't-Funded Civilian	2,768.46	3,318.17	3,700.10	4,235.03	4,798.50	5,401.49	5,955.28	6,896.86	7,300.69	8,404.76	8,957.52	10,829.74	12,968.77	15,323.68	18,362.53
Totals:	27,397.80	32,837.99	36,618.23	41,911.58	47,487.93	54,345.99	58,935.86	68,254.09	72,250.56	83,176.95	88,647.23	107,175.49	128,344.25	151,649.37	181,723.04

Cost

View:  Filter by Cost Summary     All Cost Factors

Category	Element	GS1	GS2	GS3	GS4	GS5	GS6	GS7	GS8	GS9	GS10	GS11	GS12	GS13	GS14	GS15
Compensation	Avg Cost of Base Pay (Civilian)	19,659.38	23,563.00	26,275.56	30,073.79	34,075.11	38,996.14	42,289.61	48,975.94	51,843.61	59,683.88	63,609.10	76,904.10	92,093.81	108,816.48	130,395.93
Compensation	Avg Cost of Holiday Pay	18.24	21.86	24.37	27.90	31.61	36.17	39.23	45.43	48.09	55.36	59.00	71.33	85.42	100.93	120.95
Compensation	Avg Cost of Overtime Pay	298.40	357.65	398.82	466.47	517.20	591.90	641.89	743.37	786.90	905.90	965.48	1,167.28	1,397.83	1,651.65	1,979.19



# Inflation Indices

## Operation and Maintenance Army (OMA) Appropriation

Fiscal Year	Yearly Esc. Factor	Base Year 2005		Base Year 2006		Base Year 2007		Base Year 2008		Fiscal Year
		COMPOUND	COMPOSITE	COMPOUND	COMPOSITE	COMPOUND	COMPOSITE	COMPOUND	COMPOSITE	
1982	1.0760	0.5719	0.5782	0.5547	0.5608	0.5412	0.5472	0.5285	0.5343	1982
1983	1.0400	0.5947	0.6001	0.5768	0.5821	0.5628	0.5679	0.5496	0.5546	1983
1984	1.0380	0.6174	0.6264	0.5988	0.6076	0.5842	0.5927	0.5705	0.5788	1984
1985	1.0340	0.6383	0.6451	0.6191	0.6257	0.6040	0.6104	0.5899	0.5961	1985
1986	1.0280	0.6563	0.6637	0.6365	0.6437	0.6210	0.6280	0.6064	0.6133	1986
1987	1.0270	0.6739	0.6839	0.6537	0.6633	0.6377	0.6472	0.6228	0.6320	1987
1988	1.0300	0.6942	0.7080	0.6733	0.6867	0.6569	0.6700	0.6415	0.6543	1988
1989	1.0420	0.7234	0.7382	0.7016	0.7160	0.6845	0.6985	0.6685	0.6821	1989
1990	1.0410	0.7530	0.7643	0.7304	0.7414	0.7126	0.7233	0.6959	0.7063	1990
1991	1.0430	0.7854	0.7966	0.7618	0.7727	0.7432	0.7538	0.7258	0.7362	1991
1992	1.0300	0.8090	0.8188	0.7846	0.7941	0.7655	0.7748	0.7476	0.7566	1992
1993	1.0240	0.8284	0.8408	0.8035	0.8155	0.7839	0.7956	0.7655	0.7770	1993
1994	1.0200	0.8449	0.8578	0.8195	0.8320	0.7995	0.8117	0.7808	0.7927	1994
1995	1.0190	0.8610	0.8704	0.8351	0.8442	0.8147	0.8236	0.7956	0.8043	1995
1996	1.0200	0.8782	0.8887	0.8518	0.8619	0.8310	0.8409	0.8116	0.8212	1996
1997	1.0180	0.8940	0.8990	0.8671	0.8720	0.8460	0.8507	0.8262	0.8308	1997
1998	1.0070	0.9003	0.9067	0.8732	0.8794	0.8519	0.8579	0.8319	0.8378	1998
1999	1.0080	0.9075	0.9174	0.8802	0.8898	0.8587	0.8681	0.8386	0.8478	1999
2000	1.0140	0.9202	0.9300	0.8925	0.9021	0.8708	0.8801	0.8503	0.8595	2000
2001	1.0180	0.9368	0.9435	0.9086	0.9151	0.8864	0.8928	0.8656	0.8719	2001
2002	1.0080	0.9442	0.9550	0.9159	0.9263	0.8935	0.9037	0.8726	0.8825	2002
2003	1.0100	0.9537	0.9723	0.9250	0.9431	0.9025	0.9201	0.8813	0.8985	2003
2004	1.0200	0.9728	0.9915	0.9435	0.9617	0.9205	0.9382	0.8989	0.9162	2004
2005	1.0280	1.0000	1.0202	0.9699	0.9896	0.9463	0.9654	0.9241	0.9428	2005
2006	1.0310	1.0310	1.0528	1.0000	1.0211	0.9756	0.9962	0.9527	0.9729	2006
2007	1.0250	1.0568	1.0780	1.0250	1.0456	1.0000	1.0201	0.9766	0.9962	2007
2008	1.0240	1.0821	1.1039	1.0496	1.0708	1.0240	1.0446	1.0000	1.0202	2008
2009	1.0230	1.1070	1.1284	1.0737	1.0945	1.0476	1.0678	1.0230	1.0427	2009
2010	1.0220	1.1314	1.1523	1.0974	1.1177	1.0706	1.0904	1.0455	1.0649	2010
2011	1.0210	1.1551	1.1758	1.1204	1.1404	1.0931	1.1126	1.0675	1.0865	2011
2012	1.0200	1.1782	1.1993	1.1428	1.1632	1.1149	1.1348	1.0888	1.1082	2012
2013	1.0200	1.2018	1.2233	1.1657	1.1865	1.1372	1.1575	1.1106	1.1304	2013
2014	1.0200	1.2258	1.2477	1.1890	1.2102	1.1600	1.1807	1.1328	1.1530	2014
2015	1.0200	1.2504	1.2727	1.2128	1.2344	1.1832	1.2043	1.1555	1.1761	2015
2016	1.0200	1.2754	1.2981	1.2370	1.2591	1.2068	1.2284	1.1786	1.1996	2016



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# Inflation Indices

Civilian Pay (GS)

Fiscal Year	Yearly Esc. Factor	Base Year 2005		Base Year 2006		Base Year 2007		Base Year 2008		Fiscal Year
		COMPOUN D	COMPOSIT E	COMPOUN D	COMPOSIT E	COMPOUN D	COMPOSIT E	COMPOUN D	COMPOSIT E	
1982	1.0481	0.4663	0.4663	0.4519	0.4519	0.4412	0.4412	0.4291	0.4291	1982
1983	1.0399	0.4850	0.4850	0.4699	0.4699	0.4588	0.4588	0.4463	0.4463	1983
1984	1.0300	0.4995	0.4995	0.4840	0.4840	0.4726	0.4726	0.4597	0.4597	1984
1985	1.0361	0.5176	0.5176	0.5015	0.5015	0.4896	0.4896	0.4763	0.4763	1985
1986	1.0090	0.5222	0.5222	0.5060	0.5060	0.4940	0.4940	0.4806	0.4806	1986
1987	1.0225	0.5340	0.5340	0.5174	0.5174	0.5051	0.5051	0.4914	0.4914	1987
1988	1.0224	0.5459	0.5459	0.5290	0.5290	0.5164	0.5164	0.5024	0.5024	1988
1989	1.0358	0.5655	0.5655	0.5479	0.5479	0.5349	0.5349	0.5204	0.5204	1989
1990	1.0371	0.5865	0.5865	0.5683	0.5683	0.5548	0.5548	0.5397	0.5397	1990
1991	1.0398	0.6098	0.6098	0.5909	0.5909	0.5769	0.5769	0.5612	0.5612	1991
1992	1.0418	0.6353	0.6353	0.6156	0.6156	0.6010	0.6010	0.5846	0.5846	1992
1993	1.0383	0.6596	0.6596	0.6392	0.6392	0.6240	0.6240	0.6070	0.6070	1993
1994	1.0363	0.6836	0.6836	0.6624	0.6624	0.6467	0.6467	0.6291	0.6291	1994
1995	1.0285	0.7031	0.7031	0.6813	0.6813	0.6651	0.6651	0.6470	0.6470	1995
1996	1.0245	0.7203	0.7203	0.6980	0.6980	0.6814	0.6814	0.6628	0.6628	1996
1997	1.0285	0.7408	0.7408	0.7178	0.7178	0.7008	0.7008	0.6817	0.6817	1997
1998	1.0285	0.7619	0.7619	0.7383	0.7383	0.7208	0.7208	0.7012	0.7012	1998
1999	1.0340	0.7878	0.7878	0.7634	0.7634	0.7453	0.7453	0.7250	0.7250	1999
2000	1.0450	0.8233	0.8233	0.7978	0.7978	0.7788	0.7788	0.7576	0.7576	2000
2001	1.0360	0.8529	0.8529	0.8265	0.8265	0.8069	0.8069	0.7849	0.7849	2001
2002	1.0425	0.8892	0.8892	0.8616	0.8616	0.8412	0.8412	0.8183	0.8183	2002
2003	1.0423	0.9268	0.9268	0.8980	0.8980	0.8767	0.8767	0.8529	0.8529	2003
2004	1.0410	0.9648	0.9648	0.9349	0.9349	0.9127	0.9127	0.8878	0.8878	2004
2005	1.0365	1.0000	1.0000	0.9690	0.9690	0.9460	0.9460	0.9202	0.9202	2005
2006	1.0320	1.0320	1.0320	1.0000	1.0000	0.9763	0.9763	0.9497	0.9497	2006
2007	1.0243	1.0571	1.0571	1.0243	1.0243	1.0000	1.0000	0.9728	0.9728	2007
2008	1.0280	1.0867	1.0867	1.0530	1.0530	1.0280	1.0280	1.0000	1.0000	2008
2009	1.0248	1.1136	1.1136	1.0791	1.0791	1.0535	1.0535	1.0248	1.0248	2009
2010	1.0230	1.1392	1.1392	1.1039	1.1039	1.0777	1.0777	1.0484	1.0484	2010
2011	1.0230	1.1654	1.1654	1.1293	1.1293	1.1025	1.1025	1.0725	1.0725	2011
2012	1.0230	1.1922	1.1922	1.1553	1.1553	1.1279	1.1279	1.0972	1.0972	2012
2013	1.0230	1.2197	1.2197	1.1818	1.1818	1.1538	1.1538	1.1224	1.1224	2013
2014	1.0230	1.2477	1.2477	1.2090	1.2090	1.1803	1.1803	1.1482	1.1482	2014
2015	1.0230	1.2764	1.2764	1.2368	1.2368	1.2075	1.2075	1.1746	1.1746	2015
2016	1.0230	1.3058	1.3058	1.2653	1.2653	1.2353	1.2353	1.2016	1.2016	2016



# Solution

## Working Estimate of Net Financial Benefits

FY:	2008	2009	2010	2011	2012	2013	2014
Net Cost Avoidance:	\$1,519	\$2,335	\$2,388	\$2,443	\$2,500	\$2,557	\$2,616
Net Savings:	\$1,469	\$115,197	\$118,950	\$124,443	\$130,176	\$132,655	\$135,182
Net Increase In Revenue Generation:							
<b>Total Net Financial Benefits:</b>	<b>\$2,988</b>	<b>\$117,532</b>	<b>\$121,338</b>	<b>\$126,886</b>	<b>\$132,675</b>	<b>\$135,212</b>	<b>\$137,797</b>

**\$774,428**



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# REVIEW



# Example 1

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- ✓ **Current situation:** An installation is performing a business process to meet established customer requirements.
- ✓ **Process improvement:** Through discussion with the customer, the installation determines that the current level of performance is no longer required. The customer agrees to lower the requirement, and the installation is able to reduce the need for supplies and material by \$3M per year while still satisfying the revised requirement.
- ✓ **Result:** *The cost reduction of \$3M is a savings.*

## Example 2

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- ✓ **Current situation**: An organization is required by Army policy to maintain a 10-day supply of repair parts in its warehouses.
- ✓ **Process improvement**: The organization unilaterally decides to reduce its warehouse staff. With the reduced staff the organization is able to maintain only an eight-day supply of parts. This change is not coordinated with Army policy-makers, who believe that this creates an unacceptable level of risk to mission accomplishment.
- ✓ **Result**: *There is no valid cost reduction, because the organization is no longer able to meet the customer-established performance requirement. This is simply a budget cut.*

## Example 3

- ✓ **Current situation**: Ten Army civilians are engaged in performing a business process.
- ✓ **Process improvement**: The manager determines that the process could be performed more effectively with a mix of six civilians and four military personnel. HQDA approves the additional military spaces. This reduces the organization's OMA costs by the cost of four civilians. The increased MPA costs are borne by HQDA.
- ✓ **Result**: *Since savings are defined from an Army-wide, process-wide perspective, there would be a savings only if the four civilian positions that are eliminated cost more than the four military positions that are added.*

## Example 4

- ✓ **Current situation**: Throughout the Army, each of 20,000 employees devotes 10 hours per week to processing OERs.
- ✓ **Process improvement**: The Army develops new software that reduces the time per employee to six hours per week. The 20,000 employees also perform other functions that require them to remain in the workforce, so there is no opportunity to reduce total manpower costs.
- ✓ **Result**: *There is a cost avoidance equal to the cost of four man-hours per week for each of the 20,000 employees, minus the cost of developing and deploying the improved software.*

# Example 5

- ✓ **Current situation:** At an installation, each of 20 employees spends five hours per week on a given process. They use supplies and materials that cost \$800K per year.
- ✓ **Process improvement:**
  - ➔ The installation improves the process so that it requires only three hours per week from each employee. The employees also perform other functions that require them to remain in the workforce, so there is no opportunity to reduce total manpower costs.
  - ➔ The improved process reduces the requirement for supplies and materials to \$600K. These supplies and materials are purchased on a contract where the funding can be reduced.



## Example 5 (Cont)

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- **Result:**
- ***There is a cost avoidance equal to the cost of two man-hours per week for each of the 20 employees.***
- ***There is a savings of \$200K resulting from the reduced purchase of supplies and materials.***



# Example 6

- ✓ **Current situation**: Because of increasing costs of supplies and materials, an installation determines that it needs additional funding of \$500K to perform a given process. The increased requirement is not yet funded.
- ✓ **Process improvement**: The installation finds a way to reduce waste in the process, thus decreasing the amount of supplies and material needed. The unfunded requirement is reduced from \$500K to \$300K.
- ✓ **Result**: *The \$200K decrease is a cost avoidance rather than a savings because it reduces a resource requirement but does not enable the Army to remove and reapply programmed or budgeted resources.*



# Example 7

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- ✓ **Current situation**: An installation is not using the sale and outlease program.
- ✓ **Process improvement**: The installation identifies acreage that can be brought into the program. The initiative is projected to produce a revenue stream of \$3M per year.
- ✓ **Result**: *The \$3M increase is revenue generation.*



# Examples of Financial Benefits

## Index to Examples

No.	Type of Financial Benefit	Distinguishing Features
1	Savings	✓ Legitimately lowers a customer requirement
2	No financial benefit	✓ Reduces expenditures but fails to accomplish mission
3	Potential savings	✓ Requires viewing benefits from Army perspective rather than local perspective
4	Cost avoidance	✓ Makes more efficient use of people who do not leave the rolls
5	Savings and cost avoidance	✓ Makes more efficient use of people who do not leave the rolls ✓ Reduces contract cost
6	Cost avoidance	✓ Reduces the dollar value of a UFR
7	Revenue generation	✓ Makes use of sale/outlease program



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# Cost Estimating for Process Improvement

## QUESTIONS?

Did we accomplish your goals & objectives?



# Sample Cost Estimate



## Projected Cost Avoidance



Estimated Financial Benefits (\$K)								
	FY10	FY11	FY12	FY13	FY14	FY15	FY16	Total Cost Avoidance
Cost Avoidance	\$ 123,811	\$ 125,173	\$ 127,176	\$ 129,338	\$ 131,536	\$ 133,773	\$ 136,047	\$ 906,553

REDUCE VENDOR PAYMENT PENALTIES WITHIN USAREUR								
FISCAL YEAR	2010	2011	2012	2013	2014	2015	2016	Totals
Inflation Factor (Taken from DA Inflation Indices 01/07/2010)	1.079	1.011	1.016	1.017	1.017	1.017	1.017	
Baseline Disbursements (Monthly average from Oct 07 thru Feb 09 = \$66,833,697 x 12 = \$802,004,394 Average Annual Disbursement.)	\$809,272,433	\$810,123,649	\$831,710,631	\$845,044,466	\$859,715,322	\$874,390,488	\$889,194,101	\$9,927,144,495
Baseline Penalties (Average monthly penalty from Oct 07 thru Feb 09)	\$ 254	\$ 264	\$ 264	\$ 264	\$ 264	\$ 264	\$ 264	
Forecast Annual Penalty Without Change (Disbursement x \$264/\$1,000,000)	\$ 218,655	\$ 215,985	\$ 219,440	\$ 222,171	\$ 226,965	\$ 230,823	\$ 234,747	\$ 1,564,766
Forecast Penalties (Average monthly penalty from July 09 thru Dec 09, after first improvement was implemented in June 09)	\$ 111	\$ 111	\$ 111	\$ 111	\$ 111	\$ 111	\$ 111	
Forecast Annual Penalty With Improvements (Disbursement x \$111/\$1,000,000)	\$ 89,824	\$ 90,812	\$ 92,265	\$ 93,833	\$ 95,428	\$ 97,051	\$ 98,701	\$ 657,913
Projected Cost Avoidance	\$ 123,811	\$ 125,173	\$ 127,176	\$ 126,338	\$ 131,536	\$ 133,773	\$ 136,047	\$ 906,853
Less One-time Purchase of Date Stamps	\$ 300							\$ 300
Total Projected Cost Avoidance								\$ 906,553

Approved: Audrey M. Schneider  
 Audrey M. Schneider, Resource Manager

7 June 2010  
 Date



## Rates for President's Budget FY12 (#2617)

### Civilian Cost Factors in support of the PB

Version 2617 reflects RMD Guidance 702 released December 2010.

Pay raise assumptions:

FY 11 - 1.4%

FY 12 - 0.0%

FY 13 and beyond - 2.3%

Foreign currency adjustments were applied according to the RMD guidance.

Oa	Roc	Ctype	RateGroup	FY 2011 Avg Wy Rate	FY 2012 Avg Wy Rate	FY 2013 Avg Wy Rate	FY 2014 Avg Wy Rate	FY 2015 Avg Wy Rate	FY 2016 Avg Wy Rate	FY 2017 Avg Wy Rate	FY 2018 Avg Wy Rate
89	***	101	1	133,422	133,890	136,191	139,323	142,527	145,809	149,169	152,600
89	***	101	3	110,227	110,614	112,514	115,102	117,750	120,461	123,236	126,071
89	***	102	3	63,260	63,698	64,433	65,915	67,431	68,979	70,565	72,188
89	***	110	1	76,311	76,578	77,894	79,686	81,518	83,395	85,317	87,279
89	***	110	3	60,509	60,721	61,764	63,185	64,638	66,126	67,650	69,206
89	***	124	3	96,278	96,615	98,275	100,535	102,848	105,215	107,640	110,116
89	***	206	3	131,221	131,681	133,943	137,024	140,176	143,403	146,708	150,082

### Definitions of OA, ROC, CTYPE and Rate Group

Definitions of OA, ROC, and CTYPE can be found in DFAS-IN Manual 37-100. *Rate Groups* are derived via a crosswalk from the Army's accounting structure into the following categories:

Rate Group 1 = AMHA

Rate Group 2 = BASOPS

Rate Group 3 = all other



# Rates for President's Budget FY08 (#2127)

## Civilian Cost Factors in support of the PB

Version 2127 reflects the changes OSD issued in PBD 610 to adjust Foreign Currency Exchange Rates and changes to Civilian Pay raise assumptions for FY 07 and out as follows:

FY07 uses 2.2%

FY 08 uses 3.0%

FY 09 and beyond uses 2.3%.

Foreign currency adjustments were applied as directed by the PBD 610.

OA	ROC	CTYPE	Rate Group	FY 2007 Avg WY Rate	FY 2008 Avg WY Rate	FY 2009 Avg WY Rate	FY 2010 Avg WY Rate	FY 2011 Avg WY Rate	FY 2012 Avg WY Rate	FY 2013 Avg WY Rate
89	***	***	1	109,939	113,884	116,252	118,925	121,661	123,990	127,322
89	***	***	3	58,985	61,101	62,372	63,807	65,274	66,524	68,311
89	***	101	1	115,051	119,179	121,658	124,455	127,318	129,755	133,242
89	***	101	3	88,440	91,614	93,518	95,670	97,870	99,744	102,423
89	***	102	3	52,311	54,085	55,307	56,578	57,880	58,982	60,574
89	***	110	1	36,901	38,225	39,020	39,917	40,835	41,617	42,735
89	***	110	3	41,458	42,945	43,838	44,846	45,877	46,756	48,012
89	***	121	1	223,626	231,651	236,466	241,905	247,470	252,208	258,984
89	***	121	3	241,299	249,957	255,154	261,023	267,026	272,138	279,451
89	***	124	3	94,307	97,689	99,721	102,015	104,362	106,359	109,217
89	***	202	1	78,506	83,909	85,653	87,623	89,638	91,355	93,809
89	***	202	3	49,690	53,110	54,214	55,461	56,736	57,823	59,376
89	***	206	3	87,384	90,520	92,402	94,527	96,701	98,553	101,201



## Official Rates for FY09-13 Cycle (POM 09) (#2175)

OA	ROC	CTYPE	Rate Group	FY 2008 Avg WY Rate	FY 2009 Avg WY Rate	FY 2010 Avg WY Rate	FY 2011 Avg WY Rate	FY 2012 Avg WY Rate	FY 2013 Avg WY Rate	FY 2014 Avg WY Rate
89	***	101	1	118,368	120,829	123,608	126,451	128,871	132,334	135,378
89	***	101	3	88,332	90,168	92,242	94,364	96,171	98,754	101,025
89	***	102	3	51,802	52,971	54,190	55,436	56,491	58,016	59,350
89	***	110	1	42,774	43,664	44,669	45,696	46,571	47,822	48,922
89	***	110	3	46,482	47,449	48,540	49,656	50,607	51,966	53,162
89	***	124	3	72,172	73,672	75,366	77,100	78,576	80,688	82,543
89	***	206	3	71,055	72,532	74,201	75,907	77,361	79,439	81,266