



*Logistics Engineering Center  
Cost Analysis Strategy  
Assessment*

Introduction

2012



# Agenda

This presentation answers the following questions:

- What is CASA?
- Who uses CASA?
- When is CASA used?
- How does CASA work?
- What does CASA produce?
- How do I obtain CASA?





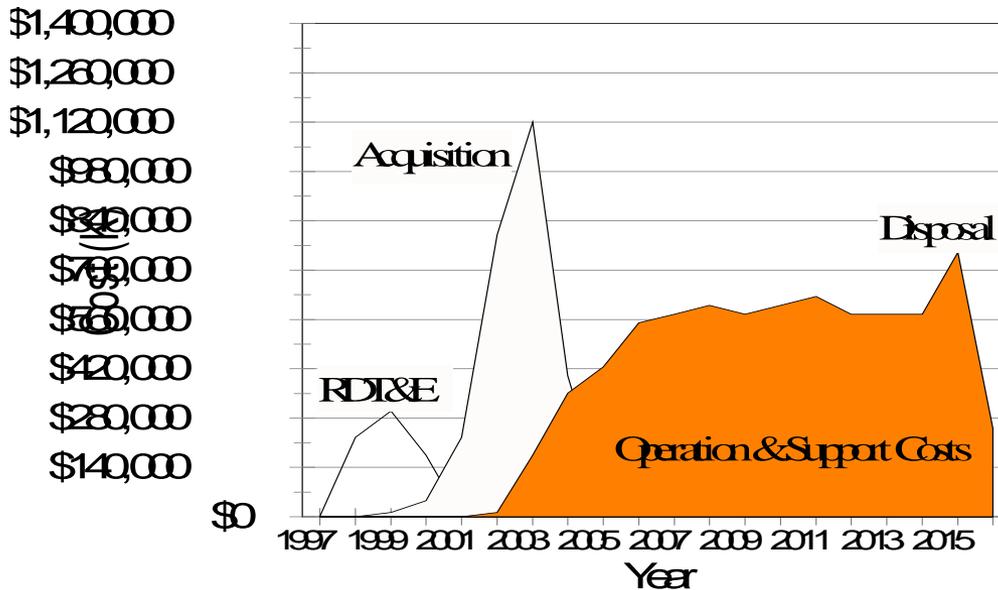
# What is CASA?

- Life Cycle Cost (LCC) Decision Support Tool
  - Estimates Total Cost of System Ownership Based on User's Input: RDT&E, Acquisition/Production, O&S, and Disposal
  - Covers Entire Life of System, From its Initial Research Costs to Those Associated With Yearly Maintenance (i.e., Spares, Training, Support Equipment, Manpower, Etc.)
  
- Secondary Calculations Include Operational Availability and Optimization of Line Replaceable Unit (LRU) Spares Quantities and Allocation



# What is CASA?

## Life Cycle Cost



While low price may be an attractive decision factor, usually the cost to maintain and operate a system is the dominant cost over the life cycle.



# What is CASA?

- Uses Standard Engineering LCC and Logistics Equations for Computation of Costs and Resource Requirements

$$TCCS_v = \sum_{i=1}^{N(CMM_v)} [F(v = Y(CMM_v))](CMM_v)(CSTCMM_v)$$

Example: Contractor Services Cost equation



# What is CASA?

There are four main types of cost estimation used in defense acquisitions:

- Analogy – subjective and imprecise comparison of a new system to an existing system.
- Parametric – uses statistical analysis to compare aspects of many similar systems to create a cost estimating relationship, but constrained to statistical correlations among available data.
- Engineering – detailed, but sometimes timely and expensive, bottom-up analysis that includes all materials, parts, and labor to identify cost drivers during system development.
- Actual Cost – costs are extrapolated based on identical systems using actual costs from completed portions of development.



# Who Uses CASA?

From January 2010 through October 2011, CASA received over 730 new registrations. A sampling of those registrations are included in the list below:

Organization / Location	Estimated Number of Registrants
U.S. Army - AMCOM	63
U.S. Army - USAMC	45
U.S. Army - TACOM	39
U.S. Army - CECOM	28
U.S. Army - FORSCOM	9
U.S. Army - Contractors (various)	> 300
U.S. Navy	120
U.S. Air Force	44
U.S. Marines	37



# *When Is CASA Used?*

## *Technology Development Phase*

Technology Development costs contribute toward the establishment of a final design that is ready to be produced.

In CASA, these costs are throughput costs and can be broken down by percentages using the following RDT&E cost elements:

System/Project Management

System Test and Evaluation

Training

Data

Demonstration and Validation

Research and Development

Software

Other



# *When Is CASA Used?*

## *Engineering Manufacturing Development (EMD) / Production & Deployment*

The EMD/Production Deployment costs are the initial investment costs to the user to procure the systems and the supporting items necessary to make the systems operational. CASA can assess the following EMD/Production & Deployment costs:

Production Tooling and Test Equipment	Spares Reusable Containers
Production Start-up	Technical Data
System Acquisition	Initial Training
System Shipping and Storage Container	Training Device
Pre-Production Engineering	New or Modified Facilities
Pre-Production Units Refurbished	Initial Item Management
Installation	Initial Software Development
Support Equipment	Miscellaneous Acquisition
Hardware Spares	Warranty Price



# *When Is CASA Used?*

## *Operation & Support (O&S)*

The total O&S cost is the cost of operation, maintenance, and support of the systems and associated support equipment at all maintenance levels over the life of the system. CASA considers:

Operation Labor

Repair Labor

Support Equipment Maintenance

Recurring Training

Repair Parts and Materials

Repair Consumables

Condemnation Spares

Technical Data Revisions

Transportation

Recurring Facilities

Recurring Item Management

Software Maintenance

Contractor Services

Engineering Changes

Miscellaneous O&S

Recurring Warranty



# *When Is CASA Used?*

## *Disposal*

Disposal costs may be significant and must be addressed in any acquisition decision. In CASA these costs can be entered under Miscellaneous O&S cost input data group.

Examples include, but are not limited to:

Demilitarization

Environmental Clean-up



# How Does CASA Work?

## Capabilities and Features

- Stand Alone Windows 32-Bit Program
  - User Friendly Input Screens
  - Import/Export Functions for Use With EXCEL
  - Fully integrated XML import/export features
  - 1388-2B importer
  - Built-In Help File and User's Manual
  - Easy to Read Output Reports
- Modeling Capabilities
  - 1-10 Levels of Maintenance
  - Analyze Over 65,000 Hardware Items
  - Can Model Different Acquisition Scenarios
    - New, Mature, Retro-Fit



# How Does CASA Work?

## *Types of Analyses*

- LCC Estimates
  - System
  - Sub-System
  - Item
- Trade-Off Analysis
- Support Concept Analysis
- Production Rate and Quantity Analysis
- Warranty Analysis
- Spares Provisioning
- Reliability Growth Analysis
- Operational Availability Analysis



# How Does CASA Work?

## Data Tree Format

Untitled - Cost Analysis Strategy Assessment (CASA)

File View Data Reports Help

New Open Save Answer Add Delete Print Help

Casa Data Inputs

Beginning Questions

Question	Answer	Units	Limits
? Name of CASA Study	CASA Study N...	none	
? Starting Year for CASA Study	2012	years	Greater than or...
? Length of Study in Months for CASA Study	12	Months	Greater than or...
? Number of Maintenance Levels for CASA Study	2	none	Greater than or...
? Name of Maintenance Level 1	Level1	none	
? Name of Maintenance Level 2	Level2	none	



CASA Data Tree Window

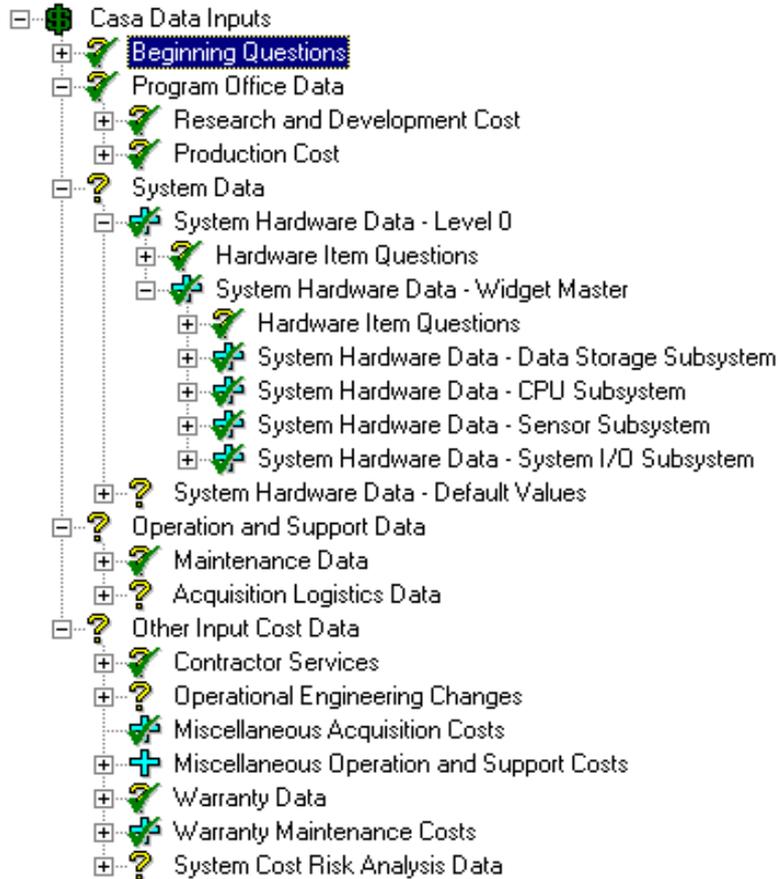


CASA Data Tree Summary View - shows a summary of information stored in highlighted branch of the Data Tree



# How Does CASA Work?

## Data Tree Format



The symbols are as follows:



Indicates lower level data is available.  
Click to expand branch.



Click on the minus sign to collapse branch.



The plus symbols (checked/unchecked) represent data elements in which you can add, delete, copy, or import items. You right click to display a popup menu and then you select the option you want.



This question has not been answered.

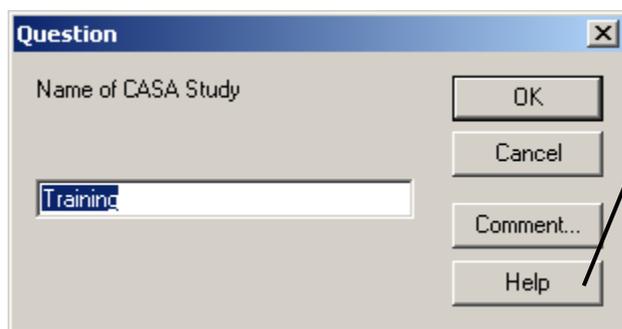


This question has been answered.



# How Does CASA Work?

## Extensive Help System



Help is available from each question within CASA. As shown in the screenshot above, press the “Help” button to display the data element definition. Help is also available from the main screen using the Help Menu.



# How Does CASA Work?

## Extensive Help System

The screenshot shows a help window titled 'General' with a search bar and a list of search results. The search term is 'Acquisition Cost Equatio'. The search results list 'Acquisition Cost Equ' as the top result. The main content area displays the title 'Acquisition Costs - New or Modified Facilities Cost Equation' and the following equation:

$$TCNF_y = \sum_{n=1}^N [T(YRFACIL_n = y)](NSQFT_n)(CSTNSQFT_n)$$

Where:

YRFACIL<sub>n</sub> = The year in which the cost of the nth new or modified facility will be incurred.

NSQFT<sub>n</sub> = The number of square feet in the nth new or modified facility.

CSTNSQFT = The average cost per square foot for the nth new

All equations utilized by CASA are available within the help system with a full explanation for each variable calculated.



# What Does CASA Produce?

## Large Selection of User Reports

- Total Life Cycle Costs (LCC)
- Constant Yearly Costs
- Inflated Yearly Costs
- Net Present Value Costs
- Operational Availability (AO) and Optimization of LRU Spares
- Sensitivity Analysis
- Maintenance Actions per Location per Item
- Support Equipment Usage
- Input Data Report
- Comparison
  - Evaluate Two CASA Data Files at Once
- Summation Report
  - Add Two or More Separate CASA Data Files



# What Does CASA Produce?

Multiple sensitivity options available for analysis:

Sensitivity Options 23

Spares Quantity  
 Change  Constant

Sensitivity Parameters (Percent of Baseline)

<input type="checkbox"/> Condemnation Portion	40	70	140	200
<input type="checkbox"/> Material Cost per Repair	40	70	140	200
<input type="checkbox"/> Mean Time Between Failure (MTBF)	40	70	140	200
<input type="checkbox"/> Mean Time To Repair (MTTR)	40	70	140	200
<input type="checkbox"/> Not Repair This Station (NRTS)	40	70	140	200
<input type="checkbox"/> Re-Test OK Portion (RTOK)	40	70	140	200
<input type="checkbox"/> Spares Turn Around Time (TAT)	40	70	140	200
<input type="checkbox"/> Unit Cost	60	80	125	150
<input type="checkbox"/> Available Support Equipment Hours	40	70	140	200
<input type="checkbox"/> Maintenance Labor Rate (MLR)	60	80	125	150
<input type="checkbox"/> Maint. Personnel Turnover Rate (TOR)	40	70	140	200
<input type="checkbox"/> Shipping Cost per Pound	40	70	140	200
<input type="checkbox"/> Spares Confidence Level (CL)	0.85	0.9	0.95	0.99
<input type="checkbox"/> Percent Labor for RTOK	40	70	140	200
<input type="checkbox"/> Production Quantity Slope	0.8	0.9	0.95	1
<input type="checkbox"/> Production Rate Slope	0.8	0.9	0.95	1
<input type="checkbox"/> System Operation Hours per Month	40	70	140	200
<input type="checkbox"/> All				

OK Cancel Help



# How Do I Obtain CASA?

## Technical Support and Contact Information

LEC Smartdesk

(256) 955-9847; DSN 645-9847

E-Mail: [logsa.powerlog.help@conus.army.mil](mailto:logsa.powerlog.help@conus.army.mil)

On the web: <https://www.logsa.army.mil/lec/casa>





[HTTPS://WWW.LOGSA.ARMY.MIL](https://www.logsa.army.mil)