Logistics Requirements Funding Summary (LRFS) Cost Estimating Tool (CET)

A Quick Cost Estimator for Logisticians

SCEA Conference – San Diego CA
June 2010

Booz | Allen | Hamilton

Agenda

- Background
  - What is an LRFS?
  - Booz Allen Task Specifics
  - LRFS Relationship to LCCE & POM
  - Challenges in Developing an LRFS
  - Why do you need the LRFS CET?
- LRFS CET Development
  - Ground Rules and Assumptions
  - The Five-Step LRFS Cost Element Definition Process
  - Data Collection/Cost Model Development
  - High Level Process Map
- LRFS CET Overview
  - User Interface
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- Summary
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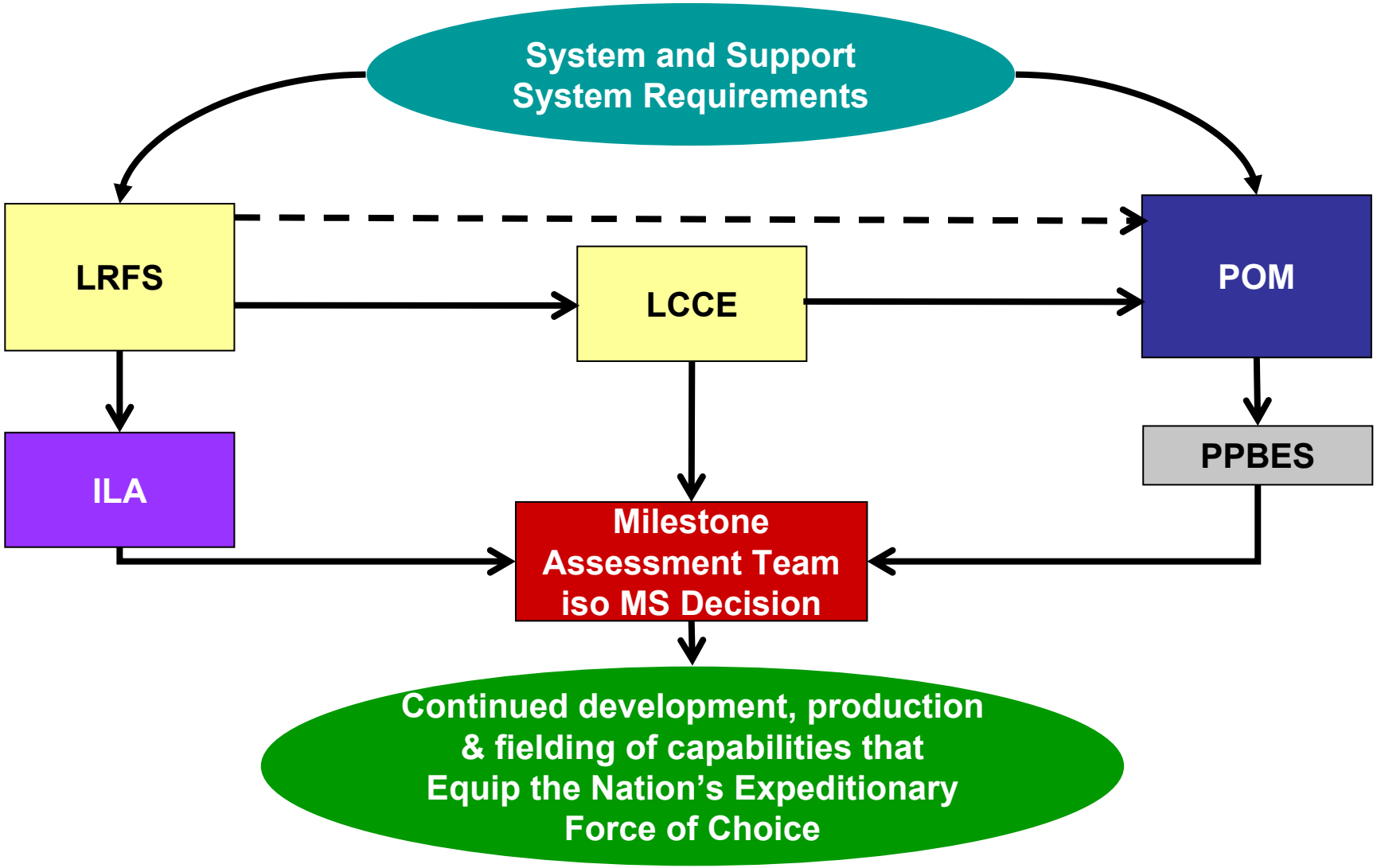
Background

Background – What is an LRFS?

- Definition: The Logistics Requirements Funding Summary (LRFS) is a breakdown of product support functions and sub-functions to establish a required level of product support. It identifies product support requirements and the funds available to meet those requirements. (source: Defense Acquisition University)
  - LRFS displays requirements versus funding for all ILS elements and related disciplines, by fiscal year and appropriation, and is traceable to logistics support plans.
  - LRFS supports Independent Logistics Assessment (ILA) review process to ensure support funding requirements for each ILS element are appropriately identified, funding is available, and shortfalls identified.

Background- LRFS Relationship to LCCE & POM



Background – Booz Allen Task Specifics

- Sponsored by Marine Corps Systems Command (MARCORSYSCOM) AC/LCL and AC/PROG
- Reviewed current DoD, Navy/USMC policies and guidance
- Conducted a market survey of existing tools relating to LRFS development
- Conducted data collection and cost estimating methodology development including compiling rates and factors from various sources

Phase I - to be completed in May 2010 –
Developed ten (10) logistics modules that include:

- Maintenance Planning
- Supply Support
- Support Equipment
- ILS Management
- Product and Technical Data
- Design Interface
- AIT / IUID
- Facilities
- Manpower and Personnel
- Training and Training Systems

Phase II - to be completed in May 2011 –
Develop six (6) final logistics modules that include:

- Performance Based Logistics
- Human Systems Integration
- Packaging, Handling, Storage, & Transportation
- Environment, Safety, & Occupational Health
- Computer Resources Support
- Configuration Management

Background – Challenges in Developing an LRFS

- Lack of cost estimating knowledge in developing LRFSs
- Lack of familiarity of financial management standards by the logistician
- Lack of standardization in Cost Element Structure (CES) and lack of sufficient supporting details
- Lack of sufficient data in conducting estimate (i.e., actuals, cost estimating factors, CERs, etc.)
- Inconsistent allocation of costs to their appropriate cost element (recurring/nonrecurring or functional elements)
- Inaccurate use of phasing, escalation factors, and appropriations
- Inconsistent review process

Background – Why do you need the LRFS CET?

LRFS Cost Estimating Tool (CET) is an Excel based user-friendly tool designed to allow program managers and logisticians to quickly generate LRFSs for all types of Marine Corps programs. The LRFS CET includes a library of cost models for all the ILS elements and related disciplines and incorporate statutory and regulatory requirements. The LRFS CET enables users to:

- Provide a more efficient, effective and accurate means of developing LRFSs
- Provide visibility of logistics support requirements
- Inform resource and assessment sponsors of logistics support requirements
- Serve as the format for presentation of support and associated funding requirements throughout program development at all acquisition milestone decision forums
- Tailorable to meet the program's support objectives
- Support LCCE, POM submission and budgetary decisions
- Assist in evaluating a weapon system's logistics costs associated with different proposals in a source selection

LRFS CET Development

LRFS CET Development – Ground Rules and Assumptions (1 of 2)

- Tool Must Be Excel-based
  - Users are familiar with Excel applications
  - Tool needs to run on existing USMC computers and software
  - Excel is powerful and integrates with VBA well
- Tool Must Be User-Friendly
  - Visual Basic user interface will guide users through the LRFS development process
  - User interface supports “Turbo Tax” approach for quick cost estimating
  - Tool will collect the information needed that is readily available to users
- Tool Must Be Designed for Non-Cost Estimators
  - Logisticians using the tool will have little or no cost estimating experience
  - Tool must have existing repository of cost models to develop estimate
  - Tool must provide documentation for cost models to allow users to defend estimates
  - Tool must provide a standard process for estimation within USMC

LRFS CET Development – Ground Rules and Assumptions (2 of 2)

- Tool Must Incorporate New Cost Element Structures (CES) for each LRFS Module
  - Original CES does not include all logistic cost elements for a program
  - Original CES is not standardized or defendable
  - CES must reflect the requirements included in the ILA Checklist
  - CES must be approved by SMEs and IPT members. Extensive SME/IPT participation is required

LRFS CET Development – Five-Step LRFS Cost Element Definition Process

DOD SecNav 5000.2D

Defense Acquisition Guidebook

Step 1	Step 2	Step 3	Step 4	Step 5
Identify Activities & Funding Requirements For Each Logistics Document	Identify methodologies & questions for each activity	Consolidate	Review Methodologies & Definitions (Project Team)	Review Methodologies & Definitions (IPT)

USMC ILA Checklist

USMC ILA Checklist Activities → Activity Methodologies And Questions

AC LCL Logistics Roadmap

AC LCL Logistics Roadmap Activities → Activity Methodologies And Questions

Existing LRFS Template

Existing LRFS Template Activities → Activity Methodologies And Questions

Major Tasks And Sub-Tasks → Major Tasks And Sub-Tasks → Major Tasks And Sub-Tasks

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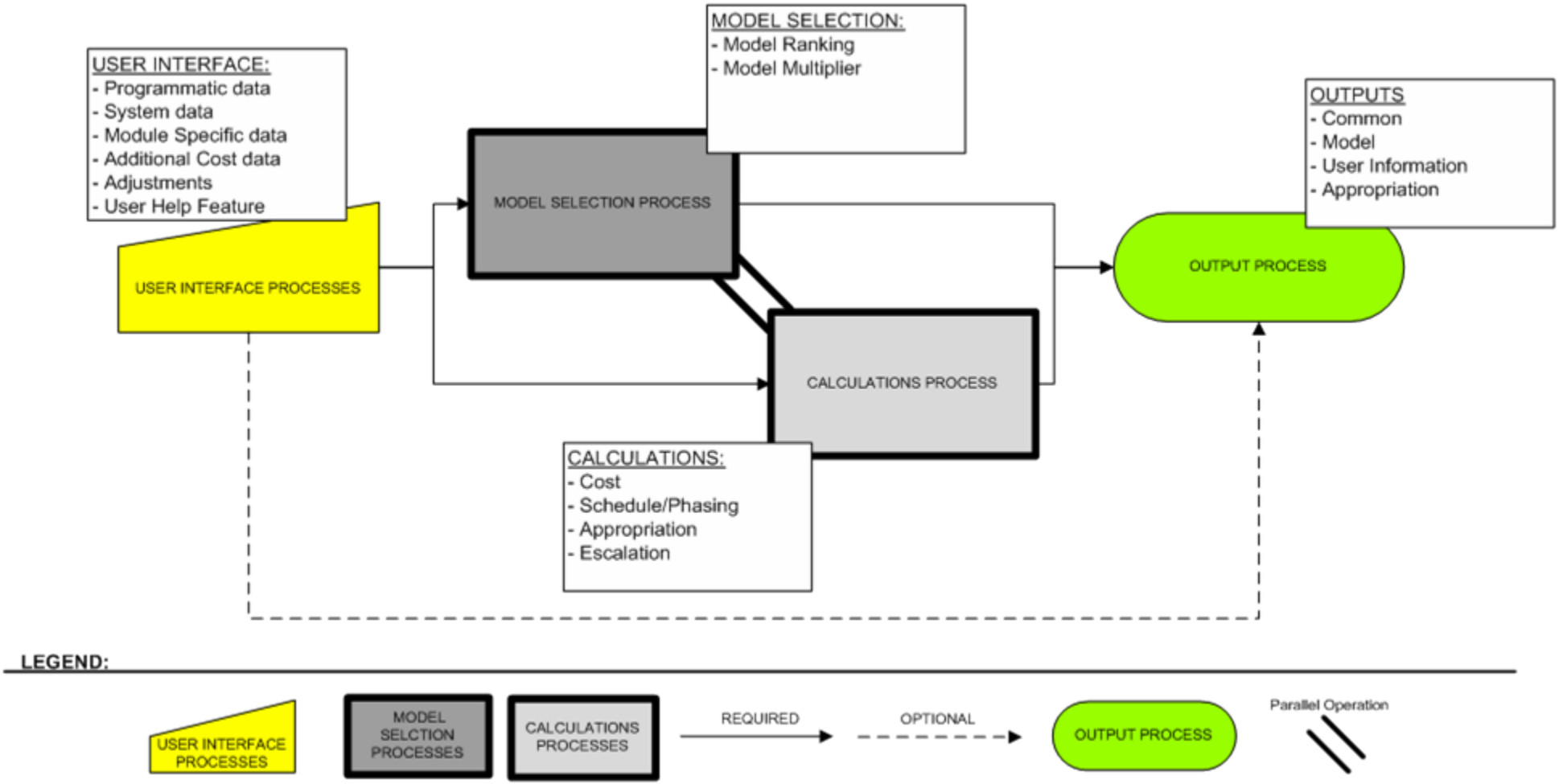
LRFS CET Development – Data Collection/Cost Model Development

- Data Collection Efforts target the collection of two types of cost models:
  - Level of Effort (LOE) Cost Models
    - Cost Models are based on Logistician SME input
  - Non-LOE Cost Models
    - Cost Models are Developed for
      - Initial Spares
      - Replenishment Spares (Consumables and Reparables)
      - Petroleum, Oil and Lubricants (POL)
      - Demilitarization/Disposal
      - Support Equipment
      - Facilities Costs
    - Data Sources for Cost Models include:
      - Program Cost Data
      - President's Budget Data
      - Individual Studies Developed
      - US Army and USMC Databases (i.e., VAMOSC, OSMIS, etc.)
- Cost data supports development of Rates, Factors and Cost Estimating Relationships

LRFS CET Development - High Level Process Map



LRFS CET Overview

LRFS CET Overview – User Interface

Programmatic Inputs

Gathers key inputs from user about the LRFS estimate being generated including:

- Estimate Name
- Mil-881 Category
- Acquisition Category
- Commodity Type
- Program Schedule
- LRFS Schedule
- Support Strategy
- Jointness / Lead Service

System Level Inputs

Gathers key inputs from user about the program/system including:

- Program Status
- Fielding Schedule
- System Costs

Module Selection Inputs

Allows the user to select a specific cost module and provide key inputs for that module including:

- Module Questionnaire
- Module Specific Information

Cost Elements

Allows the user to further review and refine the estimate for the module they have selected with key inputs and operations including:

- Review Cost Elements by Roadmap Phase
- Model Selection Customization
- Additional Costs
- User Review Status
- Appropriations Customization

Estimate Outputs

Allows the user to save and/or export results in various configurations including:

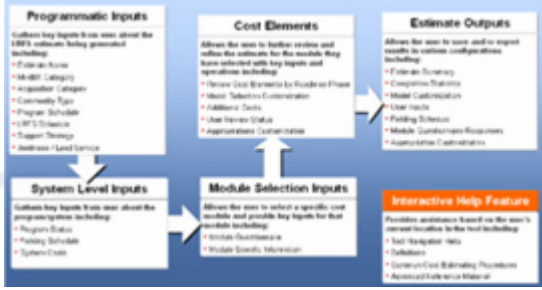
- Estimate Summary
- Completion Statistics
- Model Customization
- User Inputs
- Fielding Schedule
- Module Questionnaire Responses
- Appropriation Customization

Interactive Help Feature

Provides assistance based on the user's current location in the tool including:

- Tool Navigation Help
- Definitions
- Common Cost Estimating Procedures
- Advanced Reference Material

LRFS CET Overview

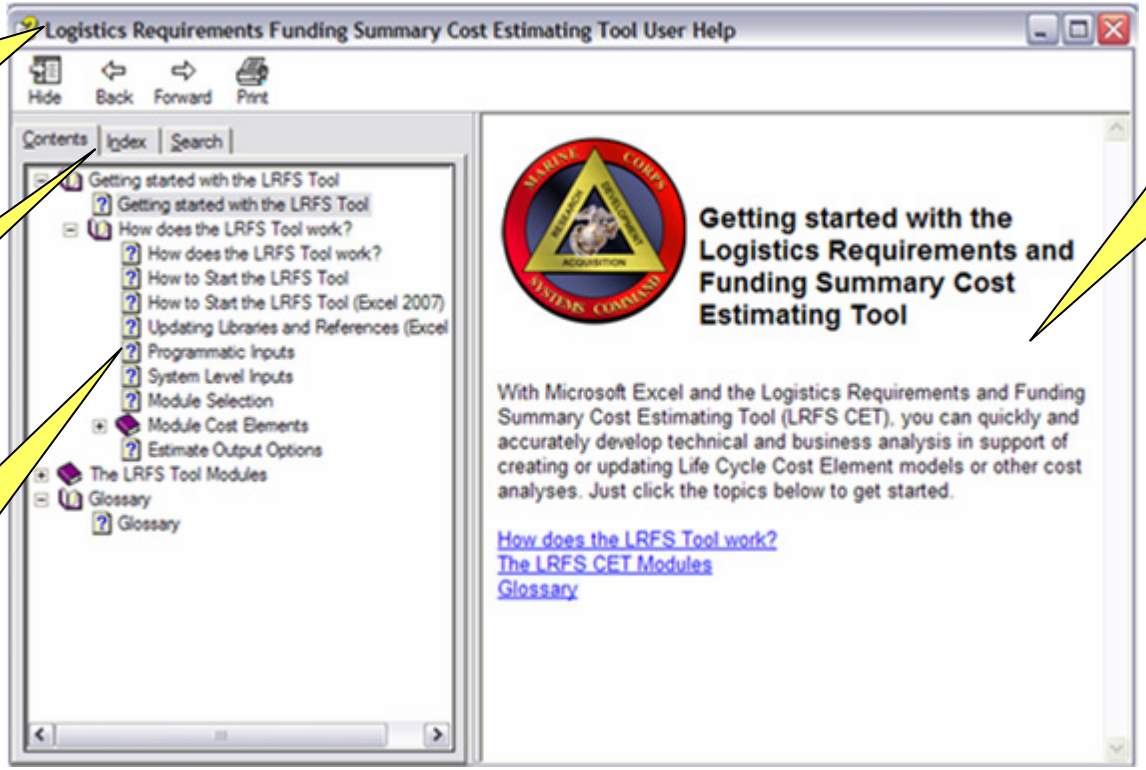


Interactive Help Feature

Can be accessed from any form in the tool at any time without interrupting the estimate by clicking "help" button

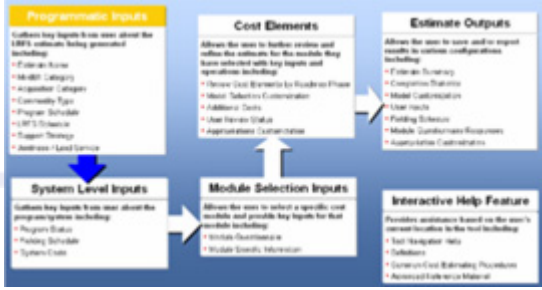
Browse or search capability

Detailed information available down to the cost element level



Automatically navigates user to appropriate topic based on location in the tool

LRFS CET Overview

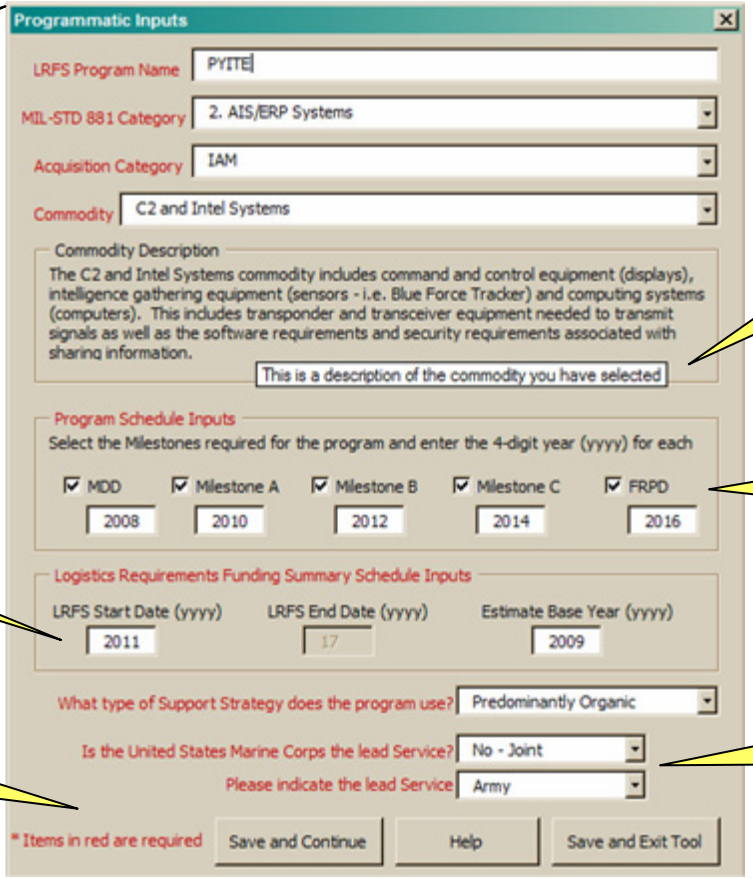


Programmatic Inputs Interface

Interface prompts user to provide basic program information

LRFS schedule is automatically generated based on user provided start date and base year

Throughout the tool, "Tool Tips" provide quick information to the user on each data field

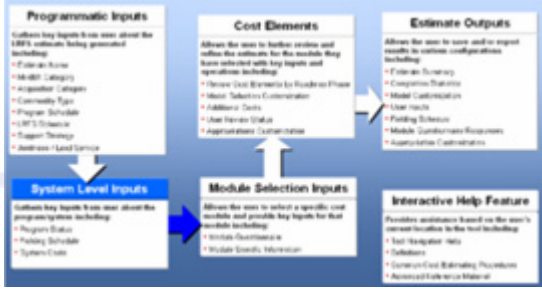


User is provided with on-screen explanation of the commodity selected

Tool allows user to provide program schedule dates and can accommodate omitted Milestones

User can specify support specifics including strategy, joint program status, and lead service

LRFS CET Overview



System Level Inputs Interface

Interface prompts user to provide basic information on the system

Tool can calculate an automatically phased fielding schedule or user may enter a specific schedule manually

User can specify the status of the program and view an on-screen explanation of the program type selected

Although not required, the user may specify any or all of three types of system unit costs

System Level Inputs

Step 1- To identify the program, select **New System**, **Upgraded System**, or **Modified System**

Program Status: New System

Status Description: A system that is not an upgrade or a modification to any existing systems. Costs can be expected to be higher, as various analyses and documents are required for new starts.

Step 2- The program production schedule may either be manually entered or automatically phased by the LRFS CET. If available, select **Use Manually Entered Schedule** to enter the fielding schedule. If automatically phasing the fielding, select **Use Automatically Phased Schedule** and provide the inputs below to automatically phase a total Approved Acquisition Objective.

Fielding Selection: Use Automatically Phased Schedule

Total number of units to be fielded	1	First Year of Fielding (yy)	12
Operational Service Life (yrs)	20	Last Year of Fielding (yy) BY2009$	18

Step 3- Three types of cost may be entered for the the system. To enter a cost, select a checkbox and provide a cost in dollars. More than one cose may be entered if available. A cost is not required, but this information will increase the accuracy of your estimate.

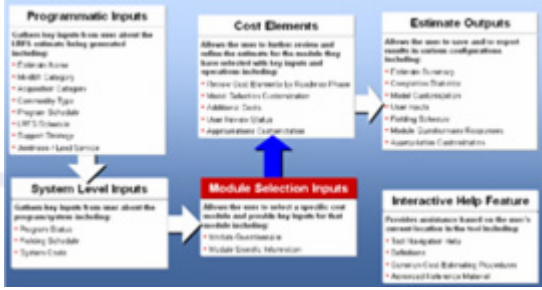
Costs

Roll-Away Cost	Average Unit Procurement Cost	Program Aquisition Unit Cost
	35,000,000	

* Items in red are required

Return to Programmatic Inputs | Save and Continue to Module Selection | Help

LRFS CET Overview

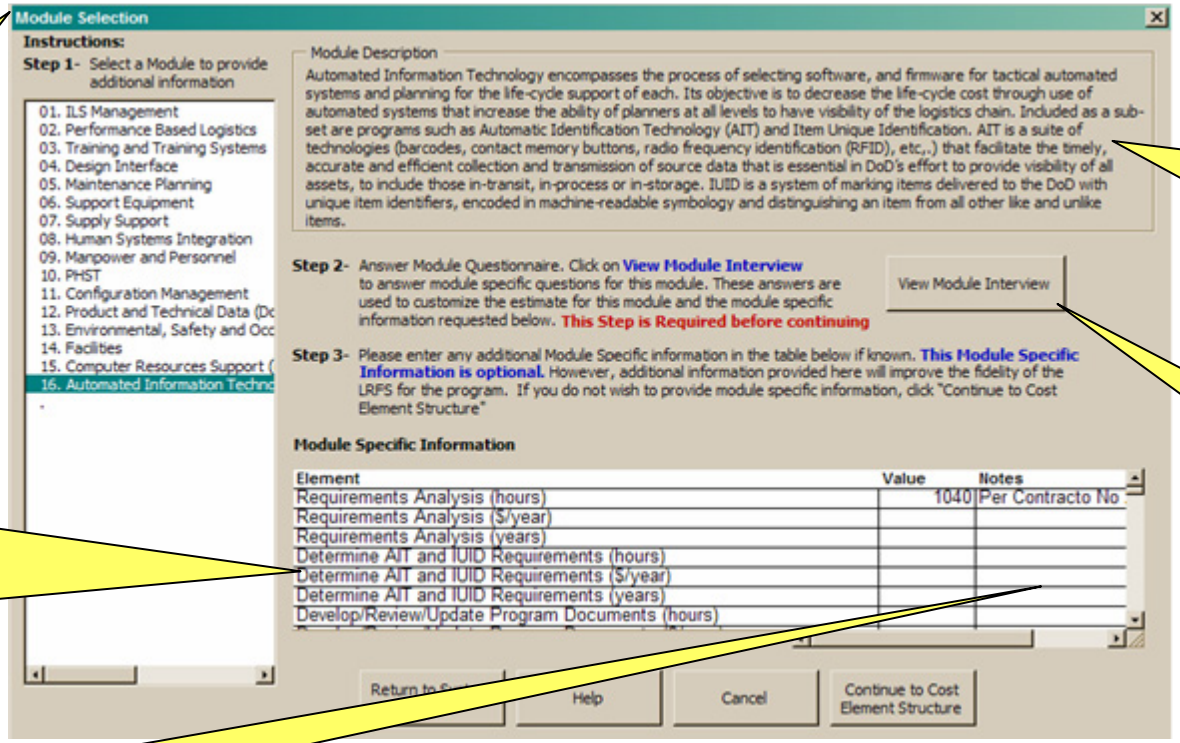


Module Selection Interface

Interface allows user to review and refine module level information

Opportunity is given to provide module specific information based on responses to module questionnaire

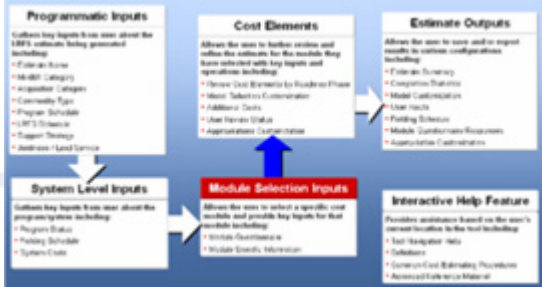
Available throughout the tool, users can provide notes for future user reference in the tool and outputs



User is provided with an on-screen explanation of the cost module selected

User has the opportunity to answer a module specific questionnaire to refine the estimate

LRFS CET Overview



Module Interview

Dynamic Interface displays a separate Module Interview for the cost module selected

Module Specific Questions- AIT

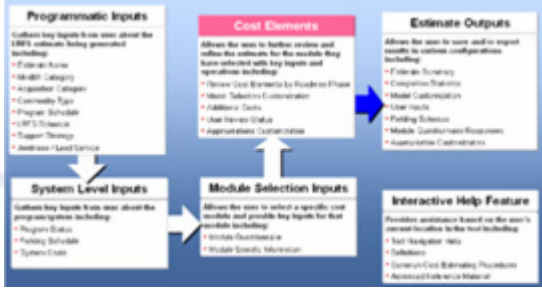
Instructions:

Step 1- Please answer the following additional Module Specific questions below if known. **If the required information is not available, select N/A** However, additional information provided here will improve the fidelity of the LRFS for the program. When all questions are completed, click "Continue to Cost Element Structure"

	Yes	No	N/A
1. Is the UAC greater than $5K, or designated as DoD serially managed/controlled inventory/mission essential?	◉	○	○
1.1 Does the system PEI include any embedded subassembly, components or parts that are DoD serially managed?	◉	○	○
1.1.1 Has the Program Office designated the item as requiring IUID?	◉	○	○
2. Will RFID capabilities be utilized?	◉	○	○
3. How many individual components require IUID markings?	50		
	Yes	**No**	**N/A**
4. Do legacy items associated with the system require Virtual UII assignment?	○	○	○
4.1 How many legacy systems require Virtual UII assignment?	50		
5. Which of the following best represents the Initial Maintenance Concept?	Interim Contractor Logistics Support		

Return to Module Selection | Help

LRFS CET Overview



Cost Element Interface

Dynamic Interface displays specific information for cost module selected

User selected organization of cost elements by AC LCL Roadmap phase allows focus on specific elements at any given time

Cost element list allows user to quickly navigate and identify reviewed and overridden cost elements

User is provided with an on-screen explanation of the cost element selected

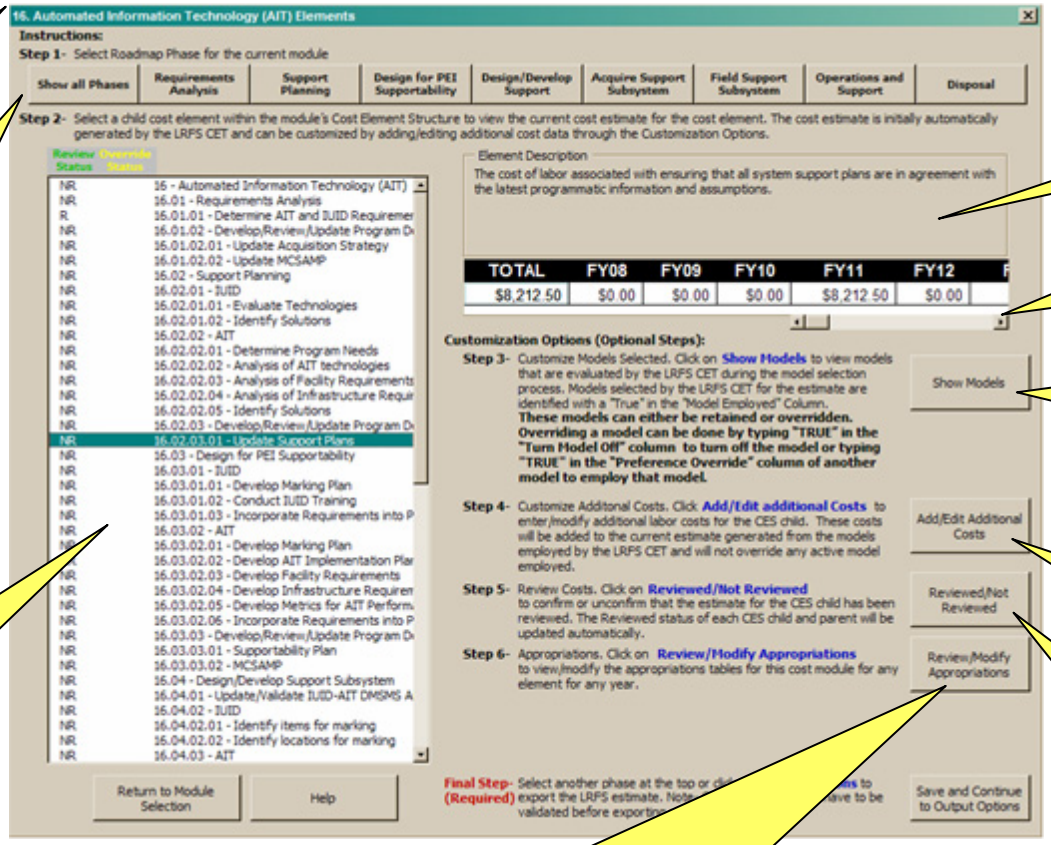
Summary row displays phased costs for each cost element

Model override feature allows advanced users to control cost models

Additional cost feature allows advanced users to add specific costs

Confirmation feature allows users to flag reviewed cost elements

Appropriation feature allows users to customize the appropriation for each cost element



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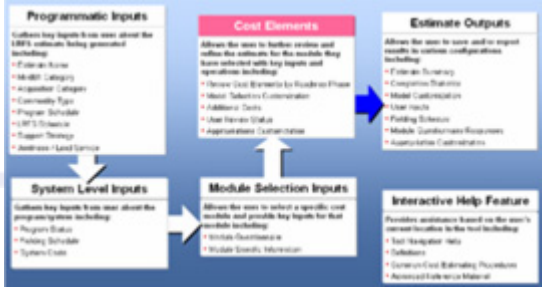
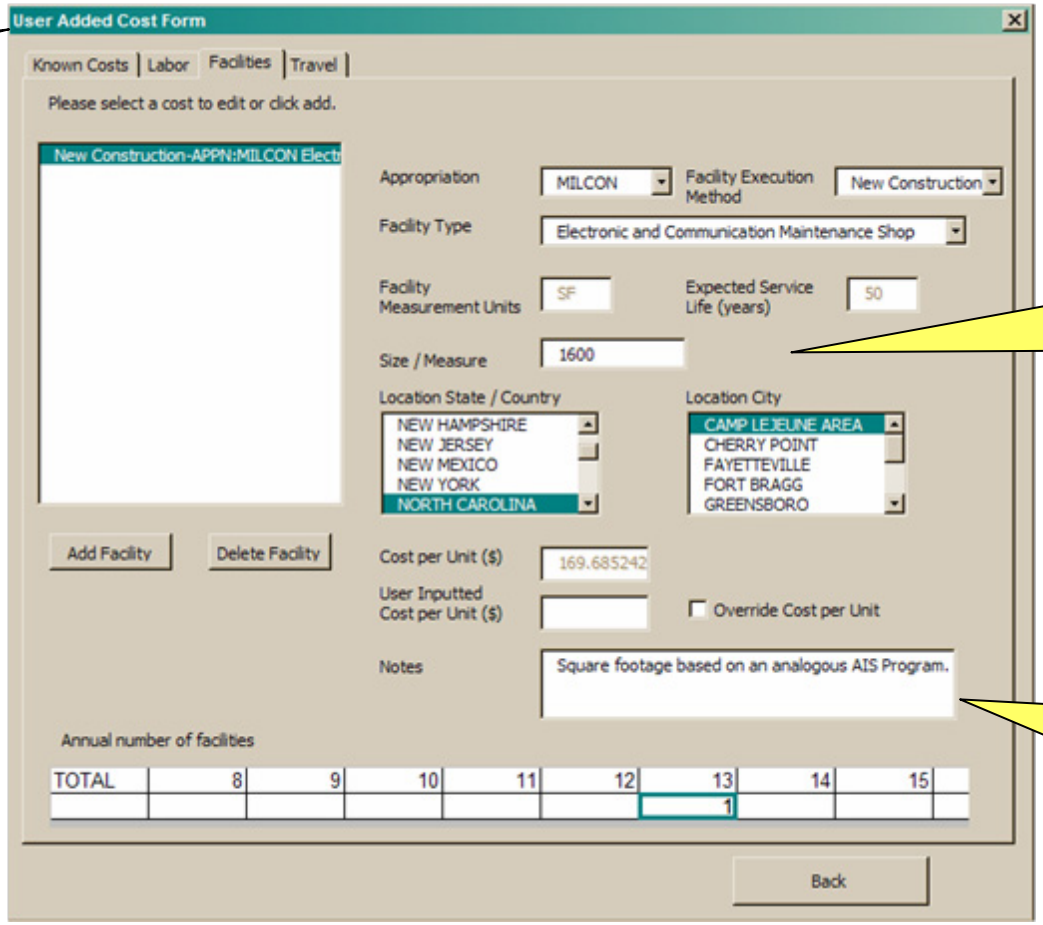


Additional Cost Interface

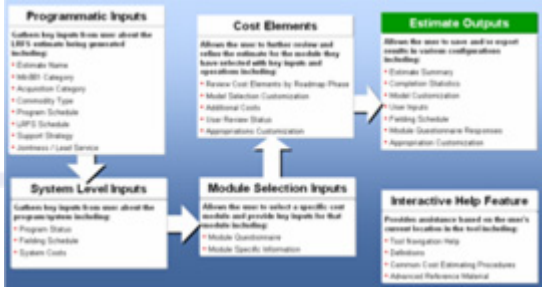
Dynamic Interface allows the input of four types of additional costs without leaving the form



Embedded databases allow user identify cost factors including Travel location, Per diem rates, Facility location, labor rates, and more

Available throughout the tool, users can provide notes for future user reference in the tool and outputs

LRFS CET Overview



Estimate Output Options Interface

Interface allows user to select specific results to output for specific cost modules

Completion statistics illustrate percentage of estimate reviewed by user

Selections allow the output of any model adjustments made

Results can be exported for use in other documents or saved

User provided information can be outputted for future reference

Selections allow the output of the estimate by appropriation quickly and easily

Estimate Output Options

Step 1-

Please check the LRFS Module(s) you wish to output results from

- 01. ILS Management
- 02. Performance Based Logistics
- 03. Training and Training Systems
- 04. Design Interface
- 05. Maintenance Planning
- 06. Support Equipment
- 07. Supply Support
- 08. Human Systems Integration
- 09. Manpower
- 10. PHST
- 11. Configuration Management
- 12. Product and Technical Data
- 13. Environmental, Safety, and Occupational Health (ESOH)
- 14. Facilities
- 15. Computer Resources Support
- 16. Automated Information Technology (AIT)

Step 2-

Please select the outputs desired below for the modules you have selected:

Common Outputs

- Total Estimate Summary (Required)
- Total Estimate Completion Statistics (Required)
- Completion Statistics for Each Module(s) Selected
- Total Estimate Summary for Each Module(s) Selected

User Information Outputs

- General User Inputs for Estimate
- Module Specific Information for Each Module(s) Selected
- Estimate Fielding Schedules
- Module Questionnaire Answers for Each Module(s) Selected

Model Outputs

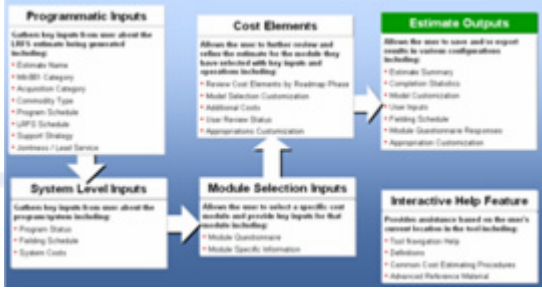
- Models Available in Tool for Each Module(s) Selected
- Models Turned Off by User for Each Module(s) Selected
- Models Overridden by User for Each Module(s) Selected

Appropriation Outputs

- Total Estimate by Appropriation Type
- Estimate by Appropriation Type for Each Module(s) Selected
- Estimate Appropriation Table for Each Module(s) Selected

Export Selections to File (MS Excel Workbook) | Return to Start of Wizard (Do not export selections) | Help | Exit the Tool

LRFS CET Overview

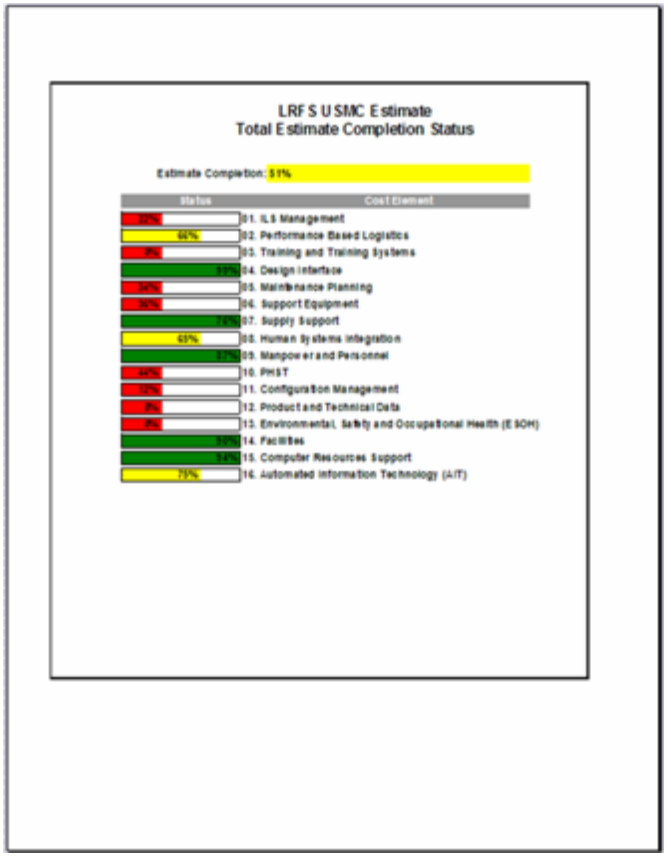


Cost Estimate Example Outputs

Once the LRFS CET output options have been selected, corresponding data is exported to a separate workbook for use in further calculations, briefs, and documents

Base-Year 10$K Summary Unadjusted for Schedule Slip

CES	Element	TOTAL	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15	FY16
	LRFS USMC	$27,788	$0	$713	$713	$5,977	$3,845	$7,482	$3,568	$2,757	$1,366
04	Design Interface	$8,460	$0	$238	$238	$1,646	$1,098	$2,327	$1,179	$908	$463
04.01	Requirements Analysis	$577	$0	$238	$238	$102	$0	$0	$0	$0	$0
04.01.01	Define Design Interface Requirements Traceability	$306	$0	$102	$102	$102	$0	$0	$0	$0	$0
04.01.02	Develop/Review/Update Program Documents	$272	$0	$136	$136	$0	$0	$0	$0	$0	$0
04.02	Support Planning	$2,174	$0	$0	$0	$997	$639	$226	$313	$0	$0
04.02.01	Provide AOA Input	$225	$0	$0	$0	$113	$113	$0	$0	$0	$0
04.02.02	Coordinate System Engineering Plan and Life Cycle Management Sustainment Plan common issues	$789	$0	$0	$0	$338	$338	$113	$0	$0	$0
04.02.02.01	Develop RAM Design Guidelines	$225	$0	$0	$0	$113	$113	$0	$0	$0	$0
04.02.02.02	Provide input to readiness modeling	$338	$0	$0	$0	$113	$113	$113	$0	$0	$0
04.02.02.03	Assess detailed design environments/system thresholds impacts	$225	$0	$0	$0	$113	$113	$0	$0	$0	$0
04.02.03	Participate in Technical/Production/Design Reviews	$451	$0	$0	$0	$113	$113	$113	$113	$0	$0
04.02.04	DMSMS	$573	$0	$0	$0	$296	$276	$0	$0	$0	$0
04.02.04.01	Establish DMSMS Management Team (DMT)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
04.02.04.02	Train DMT	$22	$0	$0	$0	$22	$0	$0	$0	$0	$0
04.02.04.03	Develop DMSMS Management Plan (DMP)	$315	$0	$0	$0	$157	$157	$0	$0	$0	$0
04.02.04.04	Evaluate Technologies and tools to support the program	$236	$0	$0	$0	$118	$118	$0	$0	$0	$0
04.02.05	Develop/Review/Update Program Documents	$136	$0	$0	$0	$136	$0	$0	$0	$0	$0
04.03	Design for PEI Supportability	$726	$0	$0	$0	$547	$179	$0	$0	$0	$0
04.03.01	Define Parts and Materials Guidance	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
04.03.02	DMSMS	$682	$0	$0	$0	$403	$179	$0	$0	$0	$0
04.03.02.01	Establish Formal Program (DMT)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
04.03.02.02	Participate in Design Review IPT	$157	$0	$0	$0	$157	$0	$0	$0	$0	$0
04.03.02.03	Incorporate Requirements into Procurement Request	$45	$0	$0	$0	$45	$0	$0	$0	$0	$0
04.03.02.04	Risk Assessment Predictive Tool	$358	$0	$0	$0	$179	$179	$0	$0	$0	$0
04.03.02.05	Provide logistics input to a BCA to Evaluate Design Alternatives	$21	$0	$0	$0	$21	$0	$0	$0	$0	$0
04.03.03	Develop/Review/Update Program Documents	$136	$0	$0	$0	$136	$0	$0	$0	$0	$0
04.04	Design/Develop Support Subsystem	$587	$0	$0	$0	$0	$0	$429	$157	$0	$0
04.04.01	Provide logistics inputs and assess impacts of engineering efforts	$315	$0	$0	$0	$0	$0	$157	$157	$0	$0
04.04.02	Coordinate logistics and engineering interfaces regarding DMSMS mitigation planning	$136	$0	$0	$0	$0	$0	$136	$0	$0	$0
04.04.03	Develop/Review/Update Program Documents	$136	$0	$0	$0	$0	$0	$136	$0	$0	$0
04.05	Acquire Support Subsystem	$1,579	$0	$0	$0	$0	$0	$941	$319	$319	$0
04.05.01	Conduct Test/Analyses	$472	$0	$0	$0	$0	$0	$157	$157	$157	$0
04.05.02	DMSMS	$971	$0	$0	$0	$0	$0	$647	$162	$162	$0
04.05.02.01	Validate BOM	$99	$0	$0	$0	$0	$0	$99	$0	$0	$0
04.05.02.02	Validate Possible Obsolete Items	$162	$0	$0	$0	$0	$0	$162	$0	$0	$0
04.05.02.03	Risk Assessment Predictive Tool	$215	$0	$0	$0	$0	$0	$215	$0	$0	$0
04.05.02.04	Provide logistics inputs to a BCA to evaluate design alternatives	$11	$0	$0	$0	$0	$0	$11	$0	$0	$0
04.05.02.05	Participate in Technical Data IPT	$485	$0	$0	$0	$0	$0	$162	$162	$162	$0
04.05.03	Develop/Review/Update Program Documents	$136	$0	$0	$0	$0	$0	$136	$0	$0	$0
04.06	Field Support Subsystem	$1,495	$0	$0	$0	$0	$0	$304	$296	$296	$298
04.06.01	DMSMS	$815	$0	$0	$0	$0	$0	$168	$162	$162	$162
04.06.01.01	Review BOM	$7	$0	$0	$0	$0	$0	$7	$0	$0	$0
04.06.01.02	Review Reliability Data	$809	$0	$0	$0	$0	$0	$162	$162	$162	$162
04.06.02	Monitor/Update Test/Analyses	$679	$0	$0	$0	$0	$0	$136	$136	$136	$136



Summary

Summary - LRFS CET Benefits

Creates Estimates Efficiently

The LRFS Cost Estimating Tool produces quick cost estimates, and provides results ready for POM inputs and the ILA process

- The LRFS Cost Estimating Tool is capable of automatically generating a complete estimate after the user has provided minimal programmatic information
- User overrides allow the quick and accurate inclusion of more precise data, and the customization of appropriation and cost models
- Exported data are organized to support quick discovery of results for inclusion in other processes, briefs, and documents

Is Easy to Use

The LRFS Cost Estimating Tool prompts the user for data and compiles the inputs directly into relevant cost models

- Little or no training is required to get started
- A step-by-step interface guides users through the cost estimating process with fields designed specifically for people unfamiliar with LRFS Cost Estimating
- Programmatic information requested from the user is often readily available
- Context-sensitive, interactive help feature allows users to browse or search for answers effectively

Produces Justified Estimates

The LRFS Cost Estimating Tool does all the calculations for the user with accuracy

- Interface is designed to allow users to input appropriate data for the estimate
- Uses a repository of documented cost model data
- A review indication helps users keep track of progress and cost elements that have been checked for inaccuracies
- An override indication helps users keep track of what cost elements have modified costs, models, and appropriations

Supports MARCORSYSCOM Mission

The LRFS Cost Estimating Tool supports MARCORSYSCOM initiatives

- Standardize the LRFS Cost Element Structure (CES) and process
- LRFS “feeds” LCCE and not vice-versa
- Logistics requirements are identified for POM submission

Questions?

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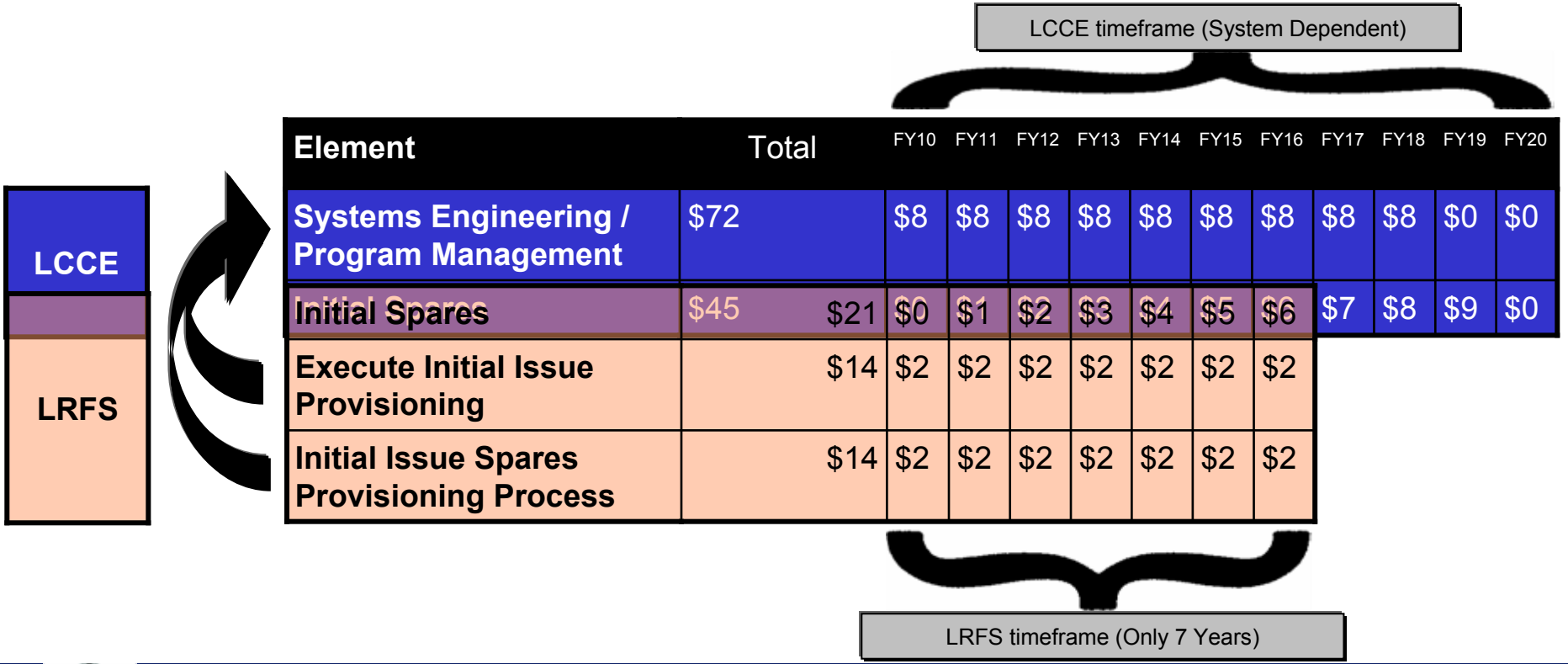
Backups

Venn Crosswalk of the LRFS to the LCCE

- **The LRFS feeds into the LCCE but the two do not merge precisely.**
  - The timeframe of interest for the LCCE tends to be longer than the LRFS
  - Some LRFS elements crosswalk directly to the LCCE (e.g.; *Initial Spares*)
  - Other LRFS elements are only a portion of the costs seen in a LCCE element (e.g *Execute Initial Issue Provisioning* and *Initial Issue Spares Provisioning Process*.)



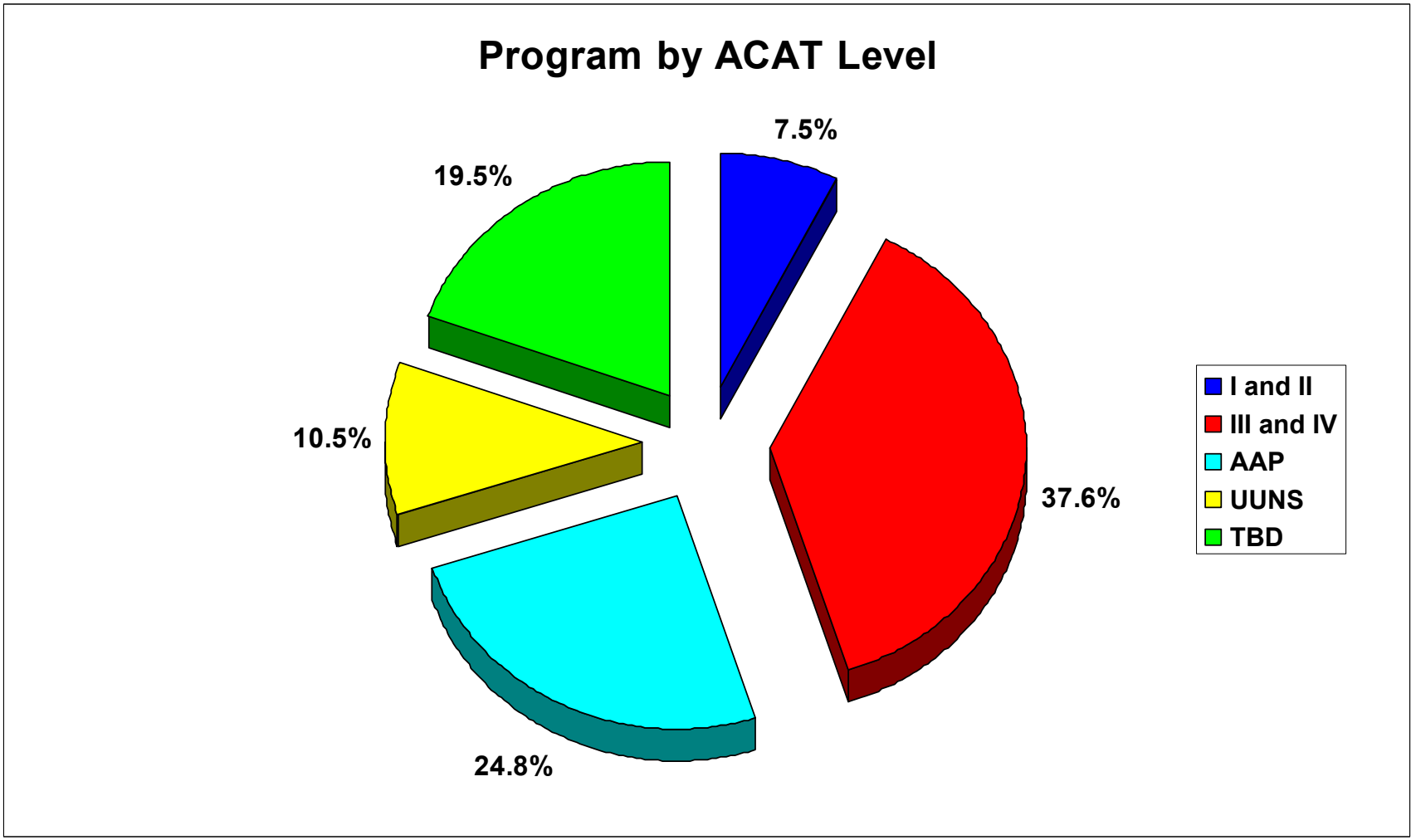
Element	Total	FY10	FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20
Systems Engineering / Program Management	$72	$8	$8	$8	$8	$8	$8	$8	$8	$8	$0	$0
Initial Spares	$45 $21	$0	$1	$2	$3	$4	$5	$6	$7	$8	$9	$0
Execute Initial Issue Provisioning	$14	$2	$2	$2	$2	$2	$2	$2				
Initial Issue Spares Provisioning Process	$14	$2	$2	$2	$2	$2	$2	$2				

Data Collection – Overview of Current Marine Corps Acquisition Programs

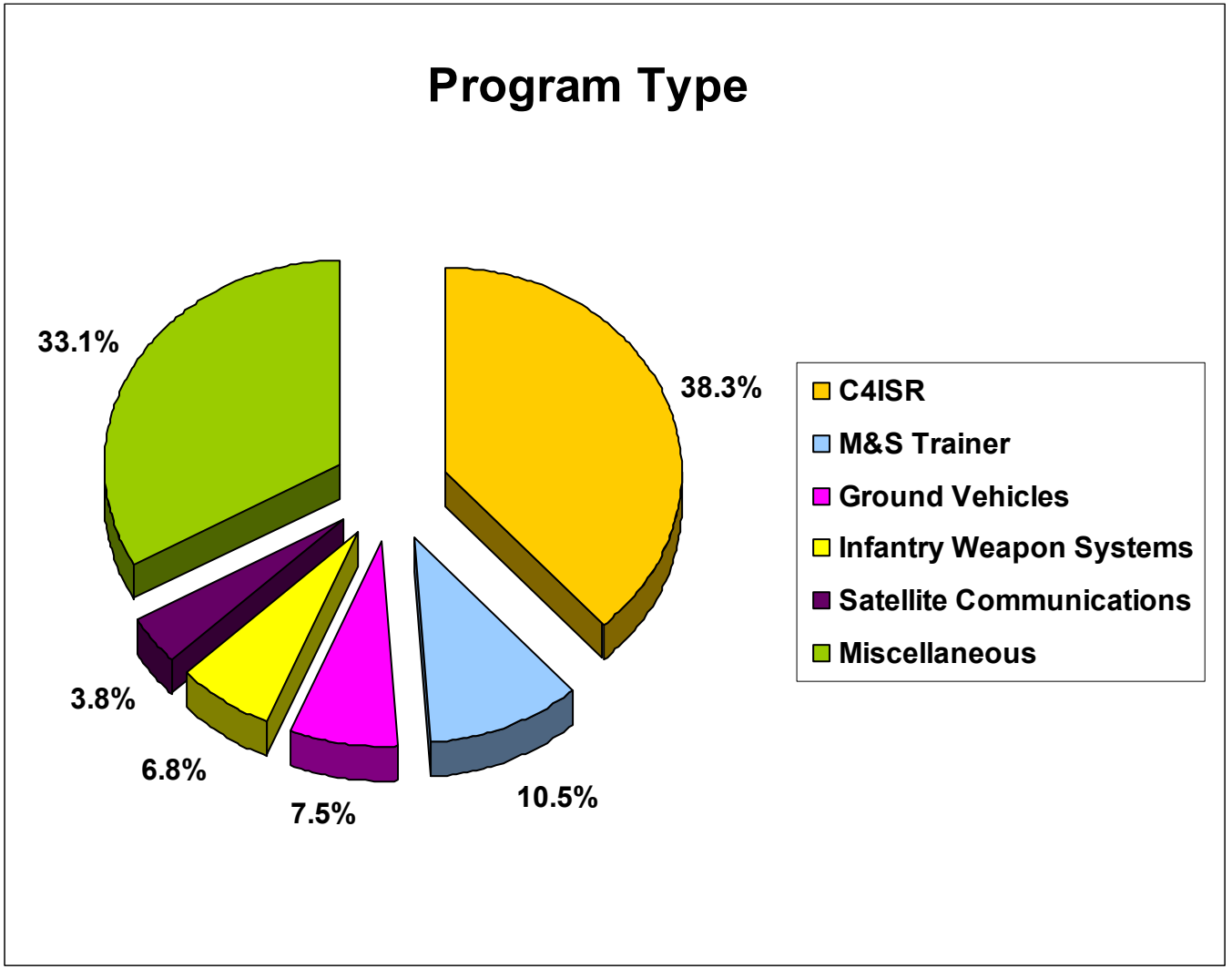
- An analysis of 133 USMC Acquisition Programs expected to require an LRFS within the next six quarters had the following characteristics:
  - 63% of programs were either ACAT III, ACAT IV, AAP
  - 30% of programs were UUNS or TBD
  - 67% of programs can be categorized under one of the following Program Types:
    - C4ISR
    - Modeling & Simulation Trainers
    - Ground Vehicle Systems
    - Infantry Weapon Systems
    - Satellite Communications
  - 55% of programs were anticipating MS B, MS C or Full Rate Production

Note: Based on data gathered July 2009

Data Collection –
USMC Acquisition Programs Surveyed by ACAT Level



Data Collection – USMC Acquisition Programs Surveyed by Program Type



Data Collection – USMC Acquisition Programs Surveyed by ACAT Level and Next Milestone Decision

	I and II	III, IV and AAP	UUNS	TBD	Total
MDD and A	0.8%	2.3%	0.0%	0.0%	**3.0%**
B	2.3%	8.3%	0.0%	0.8%	**11.3%**
C and FRPDR	3.0%	36.8%	0.0%	3.8%	**43.6%**
Other	0.8%	11.3%	0.0%	0.8%	**12.8%**
Unknown	0.8%	3.8%	10.5%	14.3%	**29.3%**
Total	**7.5%**	**62.5%**	**10.5%**	**19.5%**	**100%**