

LIFE-CYCLE LOGISTICS SUPPORT TOOLS

**A SURVEY FOR THE NATIONAL AERONAUTICS
AND SPACE ADMINISTRATION**

REPORT NS206T I

Nathaniel J. Wurst

Anthony C. Carminati

Jeff F. Gao

Yasmin Virani



SEPTEMBER 2012

NOTICE:

THE VIEWS, OPINIONS, AND FINDINGS CONTAINED IN THIS REPORT ARE THOSE OF LMI AND SHOULD NOT BE CONSTRUED AS AN OFFICIAL AGENCY POSITION, POLICY, OR DECISION, UNLESS SO DESIGNATED BY OTHER OFFICIAL DOCUMENTATION.

LMI © 2012. ALL RIGHTS RESERVED.

Contents

METHODOLOGY 1
FINDINGS 2
HOW TO USE THIS REPORT 3
APPENDIX A. LIFE-CYCLE LOGISTICS SUPPORT TOOLS
APPENDIX B. TABLE OF TOOLS BY LIFE-CYCLE PHASE
APPENDIX C. INDEX OF TOOLS BY FUNCTION

Table

Table 1. Number of Tools by Type and Function 3

Life-Cycle Logistics Support Tools

LMI conducted a survey of life-cycle logistics support tools for the National Aeronautics and Space Administration (NASA). The purpose was to identify readily available tools¹ and capabilities that would facilitate the efforts of NASA life-cycle logistics support personnel working at field centers and in various programs and projects.

The survey results are contained in this report. Appendix A contains information on each tool that was studied. Appendix B lists the tools in table format, indicating the applicable life-cycle phases. Appendix C is an index of the tools listed by function.

METHODOLOGY

The survey consisted of two rounds of research.

During round one, the project team identified three potential sources for tools: commercial, government, and LMI's library and archives. We applied the following criteria: 1) A tool must be readily available for purchase or readily available and free of charge; meaning, we excluded tools currently in development. 2) A tool must enable the user to perform at least one logistics function (e.g., logistics support analysis) or other relevant functions (e.g., cost analysis). We collected the following information in our research:

- ◆ *Type*—the form of the tool (e.g., a document)
- ◆ *Owner/developer*—the provider of the tool
- ◆ *Functions*—the tasks the tool enables the user to perform
- ◆ *Applicable life-cycle phases*—the phases during which the tool is useful
- ◆ *Description*—narrative describing the purpose and capabilities of the tool
- ◆ *Reference*—the source from which we obtained our information
- ◆ *Current users*—the organizations that use the tool
- ◆ *Years in existence*—the length of time the tool has been in existence
- ◆ *Acquisition and maintenance costs*—the costs associated with purchasing and maintaining the tool.

¹ For the purposes of the survey, the term “tools” included software, databases, models, templates, and other similar resources.

We used the tool description from the tool provider to determine a tool's functions. We used the tool description; NASA Procedural Requirements 7120.5, *NASA Space Flight Program and Project Management Requirements*; and the Defense Acquisition University (DAU) *Integrated Defense Acquisition, Technology, and Logistics Life-Cycle Management System Chart*² to determine the applicable NASA life-cycle phases. We used the tool's reference material, typically a website, and contacted tool providers by telephone and email to obtain additional information about the tool, such as users, years in existence, and acquisition and maintenance costs.

At the conclusion of round one, the LMI project team consolidated its initial findings to identify functions not represented or underrepresented by the tools identified at that point. This marked the beginning of round two of research. The objective of round two was to expand on the number of tools for the underrepresented functions.

As round two came to a close, the LMI project team focused its efforts on obtaining tool information that had eluded us. The team did this by following up on earlier telephone calls and emails to tool providers, and asking for the missing information. In most cases we eventually obtained the information; however, information for some tools was never provided. We identify these instances throughout this report as "Information not provided." In all cases, the information we obtained was sufficient to provide, at the very least, an elementary understanding of each tool.

FINDINGS

We identified 63 tools (tools are described in Appendix A) and classified them by type (i.e., document, software, or spreadsheet).

We found multiple tools for each NASA life-cycle phase, many of which are applicable to multiple phases (Appendix B identifies the tools by applicable life-cycle phase).

We also found multiple support tools for each logistics function listed in the statement of work (SOW), as well as tools germane to other logistics functions (Appendix C is an index of all the functions represented by the tools).

Table 1 summarizes the number of tools by type and function. The functions listed in the SOW are specifically called out; all other functions are grouped under "other."

² The DAU uses the *Integrated Defense Acquisition, Technology, and Logistics Life-Cycle Management System Chart* as a training aid. It shows key activities in the DoD systems acquisition processes.

Table 1. Number of Tools by Type and Function

	Document	Software	Spreadsheet
Requirements development and management	14	7	8
Design support activities	2	6	1
Logistics support analysis	7	11	0
Maintenance task analysis	0	8	0
Level of repair analysis	0	5	0
Spares assessment and provisioning	0	8	0
Maintenance data collection, management, and utilization	0	9	5
Generation of technical publications	0	9	0
Other	4	19	13

Note: The sum of the tools in Table 1 is greater than 63. This is due to the fact that some tools have multifunction capability; therefore, they are accounted for in more than one function.

Overall, we discovered a wide variety of tools, some providing multi-function capability and others limited to a single function, spanning all of the NASA life-cycle phases. Many of the government tools are available to NASA free of charge. Through this report NASA has access to information on 63 life-cycle logistics support tools. These tools can help NASA personnel working various programs and projects to perform multiple logistics functions across all NASA life-cycle phases.

HOW TO USE THIS REPORT

We developed this report (with interactive navigation) to allow the user to quickly and easily search for tools. The tools listed in Appendix B and the functions listed in Appendix C are linked to Appendix A. To see the details of a tool listed in Appendix B, click on the tool name, which will take you directly to the tool details in Appendix A. Also, to see what tool or tools perform a function listed in Appendix C, click on the page numbers associated with the function. Links to Appendix B and C are provided beneath each table in Appendix A; thus enabling a quick return to either appendix.

All website references and hyperlinks were checked to ensure they worked properly; however, it is possible that, with the passage of time, websites may change and hyperlinks may no longer work.

APPENDIX A. LIFE-CYCLE LOGISTICS SUPPORT TOOLS

Air Force Acquisition Sustainment Tool Kit (ASTK)

Type	Document
Owner/developer	U.S. Air Force
Functions	Requirements development and management Logistics support analysis
Applicable life-cycle phases	All
Description	<p>This tool encompasses all programmatic aspects relevant to product supportability, logistics, and readiness at major acquisition milestones and decision points. It consists of three major components:</p> <ul style="list-style-type: none"> ◆ <i>An ASTK Process Matrix</i> encompasses all programmatic aspects relevant to product support ability, logistics, and readiness at major acquisition milestones and decision points ◆ ASTK checklists supplement the ASTK Process Matrix and contain process descriptions, sub-tasks, and hyperlinks to supporting documentation for specific, complex processes ◆ The ASTK Keypad Checklist serves as a user guide to supplement the process matrix and checklists, providing greater detail on each process. <p>These tools were designed to ensure product supportability is incorporated early in the planning stages and throughout the product lifecycle.</p>
Reference	https://acc.dau.mil/CommunityBrowser.aspx?id=173329
Current users	U.S. Air Force
Years in existence	5
Acquisition and maintenance costs	Free of charge

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

Air Force Logistics Health Assessment (LHA)

Type	Software
Owner/developer	U.S. Air Force
Functions	Requirements development and management Life cycle management Logistics assessment
Applicable life cycle phases	All
Description	<p>The Air Force's ability to maximize warfighting effectiveness hinges on establishing and maintaining a logistics support foundation throughout the system life cycle. The Logistics Health Assessment was designed to complement the Air Force's Acquisition Sustainment (AS) Toolkit and independent logistics assessment (ILA) tools. LHA provides the acquisition and sustainment communities a standard, tailorable, user-friendly tool to report on and ensure long-term sustainment and availability considerations that can be identified and integrated into early program decisions. Ultimately, LHA enhances the potential for systems to be fielded with a support structure in place and optimizes the warfighter's ability to meet mission performance requirements.</p> <p>LHA provides the Air Force a capability to assess the logistics health of defense programs, from concept to disposal. LHA fills a void within logistics by providing a day-to-day mechanism for assessing and measuring acquisition and sustainment logistics planning and execution.</p> <p>LHA is a stand-alone decision support module accessible through the Air Force's System Metric and Reporting Tool (SMART).</p>
Reference	https://acc.dau.mil/CommunityBrowser.aspx?id=336946&lang=en-US
Current users	U.S. Air Force
Years in existence	3
Acquisition and maintenance costs	Free of charge, CAC required

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

Aircraft Sustainability Model (ASM)

Type	Software
Owner/developer	LMI 2000 Corporate Ridge McLean VA 22102-7805 (703) 917-7360 rkline@lmi.org
Functions	Requirements development and management Spares assessment and provisioning
Applicable life cycle phases	Phase C: Final design and fabrication Phase D: System assembly, integration and test, launch and checkout Phase E: Operations and sustainment
Description	<p>The ASM sparing model is a sophisticated, robust, and highly adaptable analytical tool designed to answer complex budgetary and availability challenges. It optimizes and assesses inventory allocation across multiple echelons, between non-homogeneous bases, and throughout the indenture structure. Its greater efficiency over traditional methods can lead to savings of 20 to 30 percent in spares inventory.</p> <p>The ASM sparing model</p> <ul style="list-style-type: none"> ◆ expresses the benefit of buying a particular mix of spares in terms of its effect on overall system availability; ◆ accounts for both cost and benefit of buying a particular mix of spares; ◆ maximizes the system availability for a given funding constraint; and ◆ produces an entire range of optimal spares solutions, which enable the manager to assess the impact of budgetary changes on system availability. <p>The ASM sparing model has been extensively and successfully applied to a wide variety of sparing environments, including initial system fielding, steady-state (constant level of effort), and dynamic (variable level of effort) operations.</p>
Reference	http://citrix1.lmi.org/asm/
Current users	U.S. Air Force, Marine Corps, commercial aerospace and defense firms
Years in existence	25
Acquisition and maintenance costs	\$70,000–\$100,000 (15% is maintenance cost)

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

ALE Tools & Modeling

Type	Software
Owner/developer	<p>ALE (Acquisition Logistics Engineering)</p> <p>Central Ohio Office: 6797 North High Street, Suite 324 Worthington, Ohio 43085 (614) 436-1609</p> <p>Gulf Coast Office: 4850 Gautier-VanCleave Road - Suite 3 Gautier, Mississippi 39553 (228) 522-1522 staff@ale.com</p>
Functions	<p>Logistics support analysis</p> <p>Level of repair analysis</p> <p>Life cycle cost</p>
Applicable life cycle phases	All
Description	<p>ALE has supported the logistics community for more than 20 years, providing analysts who effectively apply a wide variety of modeling, estimating, and simulation tools. ALE's collection of tools includes both commercial logistic software tools and custom-developed tools tailored to address specific logistic challenges through modeling and analysis.</p> <p>ALE's custom tools are tailored to specific applications and scenarios. ALE is adept in developing the models necessary to understand and solve customers' unique problems. Some examples include the award-winning Front-End Analysis model, as well as flexible life cycle cost models that can be tailored to address a specific commercial or military interest.</p> <p>A more comprehensive list of ALE-developed tools and models include Front End Analysis Trade Study Model, Reliability Allocation & Aggregation Tool, First Order Life Cycle Cost Model, Operational Availability Model, Repair Level Analysis Tool, Logistic Support Analysis Models & Tools, and Commercial Tools and Models.</p>
Reference	http://www.ale.com/services/analysis_services/tools_modeling.html
Current users	U.S. Coast Guard via Northrop Grumman, Lockheed Martin
Years in existence	<i>Information not provided</i>
Acquisition and maintenance costs	<i>Information not provided</i>

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

AMSAA Crow Planning Model (MH189)

Type	Spreadsheet
Owner/developer	AMSAA (Army Materiel Systems Analysis Activity) amsaa.reltools@us.army.mil
Functions	Requirements development and management Reliability growth planning
Applicable life cycle phases	Phase B: Preliminary design and technology completion Phase C: Final design and fabrication Phase D: System assembly, integration and test, launch and checkout
Description	The AMSAA Crow Planning Model (referred to as MH189) constructs idealized system reliability growth curves, identifies the test time and growth rate required to improve system reliability, and aids in demonstrating the system reliability requirement as a point estimate.
Reference	http://www.amsaa.army.mil/ReliabilityTechnology/Planning.html#MH189
Current users	DoD logistics community and support contractors
Years in existence	5
Acquisition and maintenance costs	Free of charge to U.S. government personnel and government support contractors

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

AMSAA Crow Projection Model (ACPM)

Type	Spreadsheet
Owner/developer	AMSAA (Army Materiel Systems Analysis Activity) amsaa.reltools@us.army.mil
Functions	Maintenance data collection, management, and utilization Reliability growth projection
Applicable life cycle phases	Phase B: Preliminary design and technology completion Phase C: Final design and fabrication Phase D: System assembly, integration and test, launch, and checkout
Description	The ACPM estimates the system reliability at the beginning of a follow-on test phase by taking into consideration the reliability improvement from delayed fixes.
Reference	http://www.amsaa.army.mil/ReliabilityTechnology/Projection.html#ACPM
Current users	DoD logistics community and support contractors
Years in existence	5
Acquisition and maintenance costs	Free of charge to U.S. government personnel and government support contractors

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

AMSAA Maturity Projection Model (AMPM)

Type	Spreadsheet
Owner/developer	AMSAA (Army Materiel Systems Analysis Activity) amsaa.reltools@us.army.mil
Functions	Maintenance data collection, management, and utilization Reliability growth projection
Applicable life cycle phases	Phase C: Final design and fabrication Phase D: System assembly, integration and test, launch and checkout Phase E: Operations and sustainment
Description	The AMPM estimates the projected reliability following the implementation of both delayed and non-delayed fixes. The model also provides estimates of the following important reliability growth metrics: <ul style="list-style-type: none"> ◆ B-mode initial failure intensity ◆ Expected number of B-modes surfaced ◆ Percentage of surfaced of the B-mode initial failure intensity surfaced ◆ Rate of occurrence of new B-modes.
Reference	http://www.amsaa.army.mil/ReliabilityTechnology/Projection.html#AMPM
Current users	DoD logistics community and support contractors
Years in existence	5
Acquisition and maintenance costs	Free of charge to U.S. government personnel and government support contractors

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

Arbortext Provisioning Manager

Type	Software
Owner/developer	Product and Service Advantage (PTC)
Functions	Spares assessment and provisioning Generation of technical publications
Applicable life cycle phases	Phase A: Concept and technology development Phase B: Preliminary design and technology completion Phase C: Final design and fabrication Phase D: System assembly, integration and test, launch and checkout
Description	The Arbortext Provisioning Manager provides a cost effective method of compiling initial provisioning data to the S2000M standard. Users can tailor initial provisioning data to suit the business rules of one or multiple projects, and the solution can be configured as a stand-alone operation, a fully integrated Arbortext solution for S1000D, or a combination of both.
Reference	http://www.ptc.com/product/arbortext/
Current users	BAE, Comet Solutions Inc., Carlisle Companies Inc., GKN, Kraus-Maffei Wegmann GMBH & CO KG, Honeywell
Years in existence	<i>Information not provided</i>
Acquisition and maintenance costs	<i>Information not provided</i>

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

Automated Cost Estimating Integrated Tools (ACEIT)

Type	Software
Owner/developer	Tecolote Research, Inc. Software Products & Services Group 1322 Space Park Drive, Suite A246 Houston, TX 77058 281-333-0240 aceit_sales@tecolote.com
Functions	Cost analysis Cost estimate development and documentation Uncertainty analysis
Applicable life cycle phases	All
Description	<p>ACEIT is an integrated suite of analysis tools for the desktop. Similar to how the Microsoft Office suite automates office functions, ACEIT provides a suite of applications to automate cost analysis.</p> <p>ACEIT has several core applications that focus on the following functions within the cost estimating environment:</p> <ul style="list-style-type: none"> ◆ Database development, search, and retrieval ◆ Statistical analysis/methodology development ◆ Methodology library creation ◆ Cost estimate development and documentation ◆ Automated integration with other applications ◆ Uncertainty analysis ◆ Charting and tabular reports ◆ Joint analysis of cost and schedule ◆ Capability for customization and integration. <p>ACEIT's architecture allows each tool to operate separately but have the capability to electronically and automatically link each tool together. This allows a user to quickly move from searching an electronic database, to building a cost relationship, to including it in an estimate, to assessing the risk, to generating a Power Point presentation.</p>
Reference	http://www.aceit.com/Pages/Products/ProductPage.aspx?id=f638a6d8-60e9-414a-9970-7fed249b9d25
Current users	U.S. Army, Air Force, Navy, Marine Corps; NASA; Department of Homeland Security; Department of Education; Department of Energy, >50 DoD contractors; NATO; and Australia
Years in existence	25
Acquisition and maintenance costs	Variable—Annual fee for a U.S. federal government organization; single user at a single site is \$2,350. See website for pricing. NASA may already have access to this tool.

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

CATLOC Version 6

Type	Software
Owner/developer	Systems and Logistics Engineering (SYSTECON) Oskar.Tengo@systecon.se
Functions	Design support activities Logistics support analysis Cost analysis Life cycle cost Risk management Sensitivity analysis
Applicable life cycle phases	All
Description	CATLOC is a decision support tool that enables users to identify and quantify risks, perform cost and life-cycle cost analyses, and view different outcomes through sensitivity analysis. CATLOC includes a cost model that can be tailored by the user to accommodate a unique situation. It also includes cost model templates.
Reference	http://www.systecon.se/case/C4_CATLOC/
Current users	Saab Aerosystems, Kockums, Norwegian Defence Logistics Organisation/Sea, Danish Naval Material Command, Swedish Defence Material Administration, BAE Systems Hägglunds, MBDA, Saab Aerotech, Cracow University (Institute of Rail vehicles), OCCAR, Royal Airforce/LARO, Luleå Technical University, Volvo Aero Corporation, MTU Aero Engines, Dalarna University, SIMMAD, DCN Log, ITP, Chengdu Aircraft and Design Inst., Beijing Electric Engineering, EADS Cassidian, Heli-One, Royal Australian Air Force, Samsung Thales, Thales Underwater, ADD Naval Systems, Boeing, Boeing Australia, Luleå Technical University, Danish Defence Material (DALO), Royal Thai Air Force, Australian Aerospace, Thales Australia Naval.
Years in existence	9
Acquisition and maintenance costs	The prices of licenses and maintenance follow a staggered scale that is based on the number of installation sites and number of licenses. The price for 1 single-user license for a single installation site is \$36,000; the price for 3 single-user licenses for a single installation site is \$60,000; and the price for a site license for up to 10 users is \$83,000. The first year of maintenance is not included in the license price. The annual fee for maintenance is \$7,800 for 1 single-user license for a single installation site; \$15,600 for 3 single-user licenses for a single installation site; and \$23,000 for a site license for up to 10 users. The maintenance agreement includes upgrades and updates, helpdesk support and one annual support visit.

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

Clockwork COMMAND®

Type	Software
Owner/developer	Clockwork Solutions The Canyon at Wild Basin Suite 301 115 Wild Basin Road South Austin, Texas 78746-3303 512.338.1945 info@clockwork-solutions.com
Functions	Maintenance data collection, management, and utilization
Applicable life cycle phases	Phase E: Operations and sustainment
Description	COMMAND predictive analytic offerings are focused on the evaluation, implementation, and ongoing support of a predictive maintenance solution for capital intensive, infrastructure assets. By examining key operational data and sensor based machine health indicators, COMMAND assesses risk of failure of an individual asset, prioritizes procurement of key repair parts, and schedules maintenance repairs based on the assets' risk of failure (compared to other assets in the pool).
Reference	http://www.clockwork-solutions.com/products/clockwork-command/index.php
Current users	U.S. Marine Corps PM Light Armored Vehicles, Honeywell
Years in existence	3
Acquisition and maintenance costs	Re-occurring annual fee, minimum 3-year engagement. Priced by program/system being supported with analysis, as well as the number of systems being monitored. Hosted solution; Clockwork performs source data analysis and database reparation and provides a "what-if" maintenance analysis interface through a hosted network solution. COMMAND LCM provides predictive maintenance recommendations based on future predicted KPIs.

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

Clockwork DEMAND®

Type	Software
Owner/developer	Clockwork Solutions The Canyon at Wild Basin Suite 301 115 Wild Basin Road South Austin, Texas 78746-3303 512.338.1945 info@clockwork-solutions.com
Functions	Maintenance task analysis Spares assessment and provisioning Maintenance data collection, management, and utilization Generation of technical publications
Applicable life cycle phases	Phase C: Final design and fabrication Phase D: System assembly, integration and test, launch and checkout Phase E: Operations and sustainment
Description	With DEMAND planners can reduce capital and maintenance expenses while improving system availability of capital-intensive infrastructure assets. DEMAND offerings predict future repair parts needs, maintenance labor requirements, and the optimal way to schedule maintenance. Planners assess different operational scenarios and determine the best trade-off between cost, availability, and production. Unlike traditional forecasting methods that make predictions based on trends of historical generic procurement data (with no references to cause and reason), DEMAND allows planners to develop repair parts inventory and maintenance plans based on the current condition of individual assets, their planned usage, and the intended operating environment.
Reference	http://www.clockwork-solutions.com/products/clockwork-demand/index.php
Current users	US Army UH-60, US Army OH-58, USMC SYSCOM, USMC PM LAV, USMC V-22, GEAE T700, Sikorsky Aircraft
Years in existence	12
Acquisition and maintenance costs	Re-occurring annual fee; minimum 3-year engagement. Priced by program/system being supported with analysis (not by user). Hosted solution; Clockwork performs source data analysis and database preparation and provides “what-if” analysis interface through a hosted network solution. DEMAND Pro provides flexible sustainment “what-if” analysis, while DEMAND LCM provides an ERP plug-in for predictive operational spare part purchase/move recommendations based on future predicted KPIs and fleet performance.

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

Clockwork DESIGN®

Type	Software
Owner/developer	Clockwork Solutions The Canyon at Wild Basin Suite 301 115 Wild Basin Road South Austin, Texas 78746-3303 512.338.1945 info@clockwork-solutions.com
Functions	Requirements development and management Design support activities Logistics support analysis Maintenance task analysis Maintenance data collection, management, and utilization
Applicable life cycle phases	Phase A: Concept and technology development Phase B: Preliminary design and technology completion Phase C: Final design and fabrication Phase D: System assembly, integration and test, launch and checkout Phase E: Operations and Sustainment
Description	<p>With Clockwork’s predictive analytic DESIGN products, engineers can model system availability and repair parts or maintenance labor requirements of various design alternatives. DESIGN also identifies the variables that have the greatest potential to adversely affect system performance. With this predictive insight, designers can take appropriate risk mitigation steps that will minimize costs and ensure system performance targets are met. DESIGN offerings are unique in terms of flexibility and completeness. DESIGN does not limit designers to a set of given features, and it is flexible enough to handle new requirements even after work has started.</p> <p>For each model, Clockwork sources and captures data essential to an effective analysis, including detailed system design, component reliability characteristics, production objectives, maintenance practices, repair parts inventory strategies, and logistics infrastructure design.</p>
Reference	http://www.clockwork-solutions.com/products/clockwork-design/index.php
Current users	BAE, IAI, Israeli Defense Forces, Raytheon IDS and IIS, General Dynamics Europe, Siemens, Eskom, USMC SYSCOM, LMCO
Years in existence	25
Acquisition and maintenance costs	Reoccurring annual fee; minimum 3-year engagement. Priced by program/system being supported with the analysis (not by user).

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

COMPASS

Type	Software
Owner/developer	Logistics Support Activity (LOGSA) USAMC LOGSA ATTN: AMXLS-AL (COMPASS) Redstone Arsenal, AL 35898-7466 (256) 955-9847 logsa.compass@conus.army.mil
Functions	Level of repair analysis
Applicable life cycle phases	Phase A: Concept and technology development Phase B: Preliminary design and technology completion Phase C: Final design and fabrication
Description	COMPASS is a PC-based computer model designed to assist in conducting a level of repair analysis (LORA) study. A LORA is used to determine the maintenance level at which the removal and replacement, repair, or the discard of an item should be performed. COMPASS is the Army-approved system-level LORA model.
Reference	https://www.logsa.army.mil/lec/compass/
Current users	U.S. Army
Years in existence	25+
Acquisition and maintenance costs	COMPASS is available to all U.S. government offices and their contractors working under a current contract. The model may be given to contractors with active government contracts as government-furnished equipment. Allied countries may purchase the software by entering into a foreign military sales contract with the U.S. government.

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

COMPASS LITE

Type	Software
Owner/developer	Logistics Support Activity (LOGSA) USAMC LOGSA ATTN: AMXLS-AL (COMPASS) Redstone Arsenal, AL 35898-7466 (256) 955-9847 logsa.compass@conus.army.mil
Functions	Level of repair analysis
Applicable life cycle phases	Phase A: Concept and technology development Phase B: Preliminary design and technology completion Phase C: Final design and fabrication
Description	COMPASS LITE is a program designed to perform a LORA on such items as a line-replaceable unit or shop-replaceable unit. The analysis will estimate the cost to repair or discard an item at each maintenance level (organization, direct support, general support, and depot). It also has the capability to determine costs associated with repairing an item at a contractor's facility. The program allows a user to select the specific maintenance levels (including contractor) to be included in the analysis.
Reference	https://www.logsa.army.mil/lec/compass-lite/
Current users	U.S. Army
Years in existence	25+
Acquisition and maintenance costs	COMPASS LITE is available to all U.S. government offices and their contractors working under a current contract. The model may be given to contractors with active government contracts as government-furnished equipment. Allied countries may purchase the software by entering into a foreign military sales contract with the U.S. government.

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

CORENA IETP/IETM

Type	Software
Owner/developer	CORENA CORENA USA Inc. 40 Lake Bellevue Drive Suite 230 Bellevue, WA 98005 425 643-7443
Functions	Generation of technical publications
Applicable life cycle phases	Phase B: Preliminary design and technology completion Phase C: Final design and fabrication Phase D: System assembly, integration and test, launch and checkout Phase E: Operations and sustainment
Description	<p>CORENA Interactive Electronic Technical Publication/Manual solution is composed of both a builder and a viewer. The Java-based CORENA IETP builder transforms structured source data (XML) into an interactive electronic technical publication (IETP/IETM). The CORENA IETP viewer provides a highly functional client runtime framework for viewing the publications through any standard web browser. For formats not supported natively by the browser, you can plug in other graphical viewers supporting a multitude of graphical and multimedia formats, hotspotting and graphical navigation.</p> <p>CORENA IETP provides a feature-rich and well-proven platform that leverages the structure and intelligence in your XML data. Pre-configured to handle S1000D issue 4.0 out of the box, CORENA IETP can also be configured to support older S1000D issues and other structured document types, such as ATA iSpec2200, 2300, and Military specifications.</p> <p>CORENA IETP configuration kits provide access to IETP skins and style sheets, allowing you to customize IETPs according to the specific needs of program or product.</p> <p>Corena IETP offers out-of-the-box support of most S1000D issues; support for legacy data (PDF, DOC, Excel, CAD, etc.); integration with a variety of graphic and multimedia viewers; thumbnail preview of pop-ups of referenced illustrations; on-the-fly applicability filtering of content; search engine; XML-based configuration kit for customizing style sheets and skins; rule-based information processing using style sheets for HTML output; and multiplatform support.</p>
Reference	http://www.corena.com/what_we_offer/products/corena_ietp/
Current users	Kongsberg Defence & Aerospace, RCM Technologies, Saab Aerotech, Saab Aircraft, International Aero Engines, Volvo Aero, NAPMA
Years in existence	12 (3 years for current evolution)
Acquisition and maintenance costs	CORENA offers a wide variety of software packages and pricing. Costs are based on number of users, IETP distribution base, CSDB license or hosted service costs and will be specific to each customer installation.

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

Cost Analysis Strategy Assessment (CASA)

Type	Software
Owner/developer	Logistics Support Activity (LOGSA) USAMC LOGSA ATTN: AMXLS-AL (CASA) Redstone Arsenal, AL 35898-7466 (256) 955-9847 logsa.powerlog.help@conus.army.mil
Functions	Logistics support analysis Life cycle cost Total ownership cost estimating
Applicable life cycle phases	All
Description	The CASA model is a life cycle cost (LCC)/total ownership cost (TOC) decision support tool. CASA can present the total cost of ownership depending on user selections, including cost of RDT&E, acquisition/production, operating/support, and disposal. CASA covers the entire life of the system, from initial research costs to costs associated with yearly maintenance, as well as spares, training, and other expenses. CASA is available free of charge to all U.S. personnel within the public and private sectors. This includes all federal, state, and local government agencies and private industry. Regularly scheduled training is provided free of charge in Huntsville, Alabama. Other training and support that requires travel is available on a case-by-case basis (these generally require travel funding from the requesting agency).
Reference	https://www.logsa.army.mil/lec/casa/
Current users	DoD, NASA
Years in existence	18
Acquisition and maintenance costs	Free of charge

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

Defense Acquisition Guidebook (DAG)

Type	Document
Owner/developer	Department of Defense Defense Acquisition University (703) 805-3459 issc@dau.mil
Functions	Requirements development and management Design support activities
Applicable life cycle phases	All
Description	The Defense Acquisition Guidebook (DAG) complements the DoD's fundamental acquisition policy documents, DoD Directive 5000.01 and DoD Instruction 5000.02. The DAG provides the acquisition workforce with a discretionary best practice that can be tailored to the needs of each program.
Reference	https://dag.dau.mil/Pages/Default.aspx
Current users	DoD logistics community and support contractors
Years in existence	3
Acquisition and maintenance costs	Free of charge

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

DoD Life Cycle Management Framework

Type	Document
Owner/developer	Department of Defense Defense Acquisition University Knowledge Management Team DAU-ELTC 9820 Belvoir Road Ft. Belvoir, VA 22060-5565 wallchart@dau.mil
Functions	Requirements development and management
Applicable life cycle phases	All
Description	The Integrated Defense Acquisition, Technology, and Logistics Life Cycle Management System Chart is a training aid for DAU courses. It serves as a pictorial roadmap of key activities in the systems acquisition processes. The chart illustrates the interaction of the three key processes that must work in concert: the requirements process (Joint Capabilities Integration and Development System [JCIDS]); the acquisition process (Defense Acquisition System); and program and budget development (Planning, Programming, Budgeting, and Execution [PPBE] process). These three major decision support systems are illustrated in the top left front of this chart.
Reference	https://ilc.dau.mil/
Current users	DoD logistics community and support contractors
Years in existence	7
Acquisition and maintenance costs	Free of charge

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

Draft ILA Guidebook

Type	Document
Owner/developer	NASA
Functions	Independent logistics assessment
Applicable life cycle phases	Phase B: Preliminary design and technology completion Phase C: Final design and fabrication Phase D: System assembly, integration and test, launch and checkout An ILA can also be conducted at any point in a system's life cycle.
Description	NASA operates numerous systems that require integrated logistics support (ILS) planning. Thorough development and execution of logistics plans should produce the support a system needs to attain mission success. Independent logistics assessments (ILAs), when appropriately applied to programs or projects as a planning tool, can check the development, implementation, and execution of logistics plans to ensure NASA properly supports the systems it deploys. An ILA is a valuable tool in all phases of a system's life cycle, because it provides specific information on the state of a system's logistics planning, development, and execution. LMI helped NASA develop an ILA guidebook to direct the user through an assessment and provide step-by-step guidance on how to prepare for, conduct, and complete an ILA. It offers NASA managers or contracted support personnel a defined process for evaluating logistics support during a system's life cycle.
Reference	NASA document
Current users	NASA
Years in existence	Less than 1
Acquisition and maintenance costs	Free of charge (NASA-owned)

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

EAGLE ASENT™

Type	Software
Owner/developer	Raytheon Enhanced Automated Graphical Logistics Environment (EAGLE) TU, Bldg, M11 M/S 1 6223 S. Palo Verde Road P.O. Box 11337 Tucson, Arizona 85706 USA 972.344.6179 rherman@raytheon.com
Functions	Logistics support analysis Maintenance data collection, management, and utilization Reliability, maintainability, and testability analysis Failure rate prediction Failure reporting, analysis and corrective action system
Applicable life cycle phases	Phase A: Concept and technology development Phase B: Preliminary design and technology completion Phase C: Final design and fabrication Phase D: System assembly, integration and test, launch and checkout Phase E: Operations and sustainment
Description	EAGLE ASENT™ (Advanced Specialty Engineering Networked Toolkit) is a comprehensive, graphic set of tools for reliability, maintainability, and testability analysis. The program utilizes a failure rate prediction method that is based on MIL-HDBK-217G, Draft 4. The program was recently expanded to support an ASENT FRACAS tool, which can be used alone or integrated with the ASENT installation, where it is automatically linked.
Reference	http://www.raytheoneagle.com/products_asent.html
Current users	DoD logistics community and support contractors
Years in existence	16
Acquisition and maintenance costs	Pricing is variable depending on tool suite and number of copies. R&M Tool Suite price includes the first year of software maintenance and starts at \$12,000 for 1 copy; \$11,000 each for 2–3 copies; \$10,000 each for 4–7 copies; \$9,000 each for 8–10 copies; and \$8,500 each for 11–20 copies. Quantities >20 will be negotiated. One-year software maintenance agreement for R&M Tool Suite starts at \$2,400 for 1 copy; \$2,200 each for 2 to 3 copies, \$2,000 each for 4–7 copies, \$1,800 each for 8–10 copies, and \$1,700 for 11–20 copies. Thermal Analysis Suite price includes the first year of software maintenance, and starts at \$7,000 for 1 copy, \$6,000 for 2–3 copies, \$5,500 for 4–7 copies, \$5,000 for 8–10 copies, \$4,800 for 11–20 copies. Quantities >20 will be negotiated. One year software maintenance agreement for Thermal Analysis Suite starts at \$1,400 for 1 copy, \$1,200 for 2–3 copies, \$1,100 for 4–7 copies, \$1,000 for 8–10 copies, and \$960 for 11–20 copies. FRACAS Tool Suite price includes the first year of software maintenance, and starts at \$9,500 for up to 5 seats, \$13,500 for up to 10 seats, \$18,500 for up to 15 seats, and \$23,500 for up to 20 seats. Quantities >20 will be negotiated. One year software maintenance agreement for FRACAS Tool Suite starts at \$1,900 for up to 5 seats, \$2,700 for up to 10 seats; \$3,700 for up to 15 seats; and \$4,700 for up to 20 seats.

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

EAGLE LSAR

Type	Software
Owner/developer	Raytheon EAGLE TU, Bldg, M11 M/S 1 6223 S. Palo Verde Road P.O. Box 11337 Tucson, Arizona 85706 USA 520.663.6673 raytheoneagle@raytheon.com
Functions	Design support activities Logistics support analysis Maintenance task analysis Spares assessment and provisioning Generation of technical publications Configuration management
Applicable life cycle phases	All
Description	EAGLE Logistics Support Analysis Record (LSAR) is a logistics system that uses a centrally located database as a core repository for development of all logistics products based on and compatible with MIL-STD-1388-2B, MIL-PRF-49506, and DEF STAN 00-06. The program automatically generates maintenance manuals, logistics reports, and training materials. The software allows for remote access. When used with EAGLE Publishing System (EPS) LSAR data can be reused to produce technical publications to meet the requirements of ASD S1000D and MIL-STD-40051. Features: ad hoc, administration, breakdown structure, configuration management, graphics, provisioning, reports, RMT management, support equipment, task analysis, and technical manual.
Reference	http://www.raytheoneagle.com/products_eagle.html
Current users	DoD logistics community and support contractors
Years in existence	27
Acquisition and maintenance costs	Price includes complete documentation and installation support of the EAGLE LSA software on the customer server, and starts at \$20,000 for 1 copy; \$14,000 each for 2–3 copies, \$12,000 each for 4–7 copies, \$11,000 each for 8–10 copies, and \$10,500 each for 11–20 copies. Quantities >20 will be negotiated. One year software maintenance agreement starts at \$4,000 for 1 copy, \$2,800 for 2–3 copies, \$2,400 for 4–7 copies, \$2,200 for 8–10 copies, and \$2,100 for 11–20 copies.

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

EAGLE MMIS™

Type	Software
Owner/developer	Raytheon EAGLE TU, Bldg, M11 M/S 1 6223 S. Palo Verde Road P.O. Box 11337 Tucson, Arizona 85706 USA 520.663.6673 raytheoneagle@raytheon.com
Functions	Requirements development and management Maintenance data collection, management, and utilization Performance-based logistics
Applicable life cycle phases	Phase E: Operations and sustainment
Description	EAGLE Maintenance Management Information System (MMIS) is a software tool designed to enable execution of performance-based logistics (PBL). MMIS uses LSAR data developed during the product development as the equipment baseline, and it facilitates the management of the product through its operational life. MMIS can fuse data gathered by repair facilities, forward depots, customers, subcontractors, and field representatives.
Reference	http://www.raytheoneagle.com/products_mmis.html
Current users	DoD logistics community and support contractors
Years in existence	<i>Information not provided</i>
Acquisition and maintenance costs	<i>Information not provided</i>

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

E-IML (Integrated Maintenance Logistics)

Type	Software
Owner/developer	Enigma, Inc. North American Headquarters 200 Wheeler Road Burlington, MA 01803 888-364-4624 infous@enigma.com
Functions	Maintenance data collection, management, and utilization Generation of technical publications
Applicable life cycle phases	Phase E: Operations and sustainment
Description	The Enigma E-IML Solution provides military maintenance centers with a single, integrated, environment for maintenance manuals, parts catalogs, forms, and procedure manuals, while fully integrating this technical content into existing logistics and management systems. After a soldier enters a vehicle's serial number or asset number into the system, the E-IML immediately identifies all relevant technical data and delivers the exact parts and service information required to upgrade or repair a specific vehicle or weapon system.
Reference	http://www.enigma.com/industries/defense.cfm
Current users	U.S. Army
Years in existence	<i>Information not provided</i>
Acquisition and maintenance costs	<i>Information not provided</i>

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

eLORA

Type	Software
Owner/developer	Logistics Engineering Services (Australia) Level 1, 294 Salmon Street Port Melbourne VIC 3207 AUSTRALIA +61 3 8698 6400 admin@logisticengineeringservices.com.au
Functions	Level of repair analysis
Applicable life cycle phases	Phase A: Concept and technology development Phase B: Preliminary design and technology completion Phase C: Final design and fabrication
Description	Developed to be compliant with MIL-STD-1390D, eLORA provides a structured approach to level of repair analysis. The original version of this tool is still being used on the ANZAC Frigate program. LES intends to further develop eLORA so that it can integrate fully with a MIL-STD-1388-2B, <i>Logistic Support Analysis Record</i> (LSAR).
Reference	http://www.logisticengineeringservices.com.au/elora.htm
Current users	BAE, Boeing, Ford Australia, Marshall Aerospace, Mercedes Benz, Rolls Royce Marine Australia, Sikorsky, RLM Systems (now Lockheed Martin), and others
Years in existence	<i>Information not provided</i>
Acquisition and maintenance costs	<i>Information not provided</i>

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

eMRD

Type	Software
Owner/developer	Logistics Engineering Services (Australia) Level 1, 294 Salmon Street Port Melbourne VIC 3207 AUSTRALIA +61 3 8698 6400 admin@logisticengineeringservices.com.au
Functions	Design support activities Logistics support analysis Maintenance task analysis Maintenance data collection, management, and utilization
Applicable life cycle phases	All
Description	<p>The eMRD Tool was developed by Logistic Engineering Services (LES) to simplify the application of the Australian Defence Forces (ADF) maintenance requirements determination (MRD) process. The eMRD Tool can be installed as a standalone application or installed to a network to allow multiple users. The eMRD application provides the ability to manage each user access rights to administrator, manager or user levels.</p> <p>The primary difference between eMRD and other LSAR applications is the ability of the analyst to view an LCN/ALC by its physical and functional structure, while simultaneously viewing its associated LSA configuration and data elements.</p> <p>The eMRD Tool enables the analyst to maintain a clear perspective of what he is looking at from a top down view. The eMRD Tool is used to develop a new LSAR or manage an existing LSAR. The development of a new LSAR can be accomplished by manually developing the LCN structure, or by electronically importing a text document.</p> <p>An existing MIL-STD-1388-2B LSAR can be freely imported and exported. For in-service use, eMRD has the ability to import a CAMM2 failure data file that is automatically sorted to enable the viewing of failure data for an LCN/ALC.</p>
Reference	http://www.logisticengineeringservices.com.au/emrd.htm
Current users	BAE, Boeing, Ford Australia, Marshall Aerospace, Mercedes Benz, Rolls Royce Marine Australia, Sikorsky, RLM Systems (now Lockheed Martin), and others
Years in existence	<i>Information not provided</i>
Acquisition and maintenance costs	<i>Information not provided</i>

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

Enterprise Inventory Optimization (EIO)

Type	Software
Owner/developer	SmartOps 1251 Waterfront Place Suite 301 Pittsburgh, PA 15222-4212 (412) 231-0115 sales@smartops.com
Functions	Spares assessment and provisioning Inventory management
Applicable life cycle phases	Phase B: Preliminary design and technology completion Phase C: Final design and fabrication Phase D: System assembly, integration and test, launch and checkout Phase E: Operations and sustainment
Description	SmartOps Enterprise Inventory Optimization (EIO) is a comprehensive suite of software modules that enables organizations to plan and manage inventories across global supply chains. SmartOps EIO modules allow you to analyze crucial inputs and signals, model the impact of decisions on global inventories, and ensure balanced inventory levels while respecting service levels and minimizing risk.
Reference	http://www.smartops.com/inventory-optimization
Current users	Campbell's, Celestica, Danfoss, Dow Chemical, DuPont, Eastman Chemical, Kellogg, Lexmark, Lubrizol, Medtronic, Merck, Micron, Pfizer, PPG, Polaris, Unilever
Years in existence	12
Acquisition and maintenance costs	<i>Information not provided</i>

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

EPOCH Data Management (DM)

Type	Software
Owner/developer	CMstat 3960 Howard Hughes Parkway, Suite 500 Las Vegas, NV 89169 877 537-1959 information@cmstat.com
Functions	Contract data requirements list (CDRL)
Applicable life cycle phases	All
Description	<p>CMstat's powerful CDRL software, developed to support the EIA-859 DM Standard, provides the EPOCH PM Dashboard, which gives Program Managers a quick, configurable view of deliverables status. Built-in cross reference relationships in conjunction with the embedded Custom Report Writer, provide metrics trend analysis of your deliverables process.</p> <p>EPOCH DM is an integrated CDRL software product suite that provides secure, fully automated deliverables processing.</p> <p>EPOCH DM combines extensive rules-based functionality, online document review/approval capability, BPM Advanced Workflow and Secure Web Portal functionality to streamline, manage, and record the entire submittal/receipt process.</p>
Reference	http://www.cmstat.com/cmstat_directory/software/epochdm/index.html
Current users	BAE Mobility Systems, BAE Land Systems, The Boeing Company, Canadian Space Agency, Coleman Aerospace, Fleetway, Inc., Florida Turbine Technologies, GD Land Systems, GD SatCom Technologies, GD Amphibious Systems, IMP Aerospace LTD, ITT Industries - Space lift Range Systems, ITT - Advance Engineering & Sciences, Korean Air Force, L-3 Com - GS&ES, LJT, Inc., Lockheed Martin, NASA, Northrop Grumman, Raytheon Systems Company, Raytheon C2IS, Raytheon Canada LTD, SRI International, Stanley Associates, Royal Saudi Air Force, Thales Systems Canada, Thales Raytheon, Trident Research, U.S. Air Force, U.S. Navy
Years in existence	5
Acquisition and maintenance costs	<p>Pricing is variable and based on user needs. Prices below are based on a sample quote:</p> <p>\$25,000 for standard edition server \$3,500 per EPOCH user access license \$600 per CMview/redline license (2D) 25% of total software cost for annual support and maintenance \$30,000 for implementation package (installation, training, consulting)</p>

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

GEIA-HB-0007

Type	Document
Owner/developer	Tech America 1401 Wilson Boulevard Suite 1100 Arlington, VA 22209 (703) 284-5315 standards@techamerica.org Attn: Anne
Functions	Requirements development and management Logistics support analysis
Applicable life cycle phases	All
Description	The GEIA-HB-0007 handbook provides information on the use and tailoring of the data in GEIA-STD-0007. The standard provides a new approach to logistics support analysis record (LSAR) (i.e., MIL-STD-1388-2B) data, with emphasis on data transfer (e.g., XML schemas) versus data storage (e.g., relational tables).
Reference	http://www.geia.org/GEIA-HB-0007-Bulletin—HANDBOOK-FOR-GEIA-STD-0007—LOGISTIC-PRODUCT-DATA
Current users	DoD logistics community and support contractors
Years in existence	5
Acquisition and maintenance costs	\$282

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

GEIA-STD-0007

Type	Document
Owner/developer	Tech America 1401 Wilson Boulevard Suite 1100 Arlington, VA 22209 (703) 284-5315 standards@techamerica.org Attn: Anne
Functions	Requirements development and management Logistics support analysis
Applicable life cycle phases	All
Description	The GEIA-STD-0007 standard defines logistics product data generated during the requirements definition and design of an industry or government system, end item or product. It makes use of XML through the use of entities and attributes that comprise logistics product data and their definitions. The standard is designed to provide users with a standard set of data tags for all or portions of logistics product data and customer defined sub-sets of logistics product data.
Reference	http://www.geia.org/ANSI-GEIA-STD-0007-STANDARD—LOGISTICS-PRODUCT-DATA-
Current users	DoD logistics community and support contractors
Years in existence	5
Acquisition and maintenance costs	\$282

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

Interactive Authoring & Display System (IADS)

Type	Software
Owner/developer	U.S. Army Missile Command (Army Redstone Arsenal) (256) 876-4237 IADS@Redstone.Army.mil
Functions	Generation of technical publications
Applicable life cycle phases	Phase B: Preliminary design and technology completion Phase C: Final design and fabrication Phase D: System assembly, integration and test, launch and checkout Phase E: Operations and sustainment
Description	Interactive Authoring and Display System (IADS) was developed as a U.S. Army Missile Command initiative to reduce paper documentation. IADS utilizes the Standard Generalized Markup Language (SGML) to manipulate the text and graphics. The author can choose to display graphics within the text or in separate windows. While IADS was originally developed to eliminate the need for paper technical manuals in the field; it also eliminates the need for paper documentation in the office. IADS eliminates paper storage problems, increases speed and accuracy for updates, reduces print costs, and enhances search and retrieval times. It has an intuitive user interface.
Reference	https://iads.redstone.army.mil/OverView.htm
Current users	Not available due to privacy concerns
Years in existence	22
Acquisition and maintenance costs	Government off the shelf. 1-year customer support and training at Redstone Arsenal (\$7,500), basic training at customer site (\$4,500), and advanced training at customer site (\$7,500)

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

InSync

Type	Software
Owner/developer	ISS (Integrated Support Systems) Post Office Box 1842 Clemson, SC 29633 1-800-528-9185 sales@isscorp.com
Functions	Life cycle management Configuration management
Applicable life cycle phases	All
Description	InSync is a product lifecycle management (PLM) solution with a core of sound configuration management concepts. InSync is an open, flexible, easy-to-use system for collaborative product lifecycle management (PLM). It is geared for supply chain integration, designed to manage information throughout a product's service life, flexible and easy to use, easily adaptable, protective of your investment, scalable in implementation and use, built around configuration management best practices, inexpensive to implement and maintain, easily integrated with other systems, and faithful to industry standards.
Reference	http://www.isscorp.com/html/insync_overview.html
Current users	Boeing, Lockheed Martin, and Raytheon
Years in existence	<i>Information not provided</i>
Acquisition and maintenance costs	<i>Information not provided</i>

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

IVARA EXP Reliability Strategy Development

Type	Software
Owner/developer	IVARA Corporation 5046 Mainway Burlington Ontario L7L 5Z1 Canada (877) 746-3787 ext. 312
Functions	Maintenance task analysis Reliability-centered maintenance
Applicable life cycle phases	Phase A: Concept and technology development Phase B: Preliminary design and technology completion Phase C: Final design and fabrication
Description	<p>IVARA's Reliability Strategy Development module helps define asset improvement strategies based on business prioritization. It helps develop action plans using the leading reliability-centered maintenance (RCM) methodology, RCM2, and ensures quick results with maintenance task analysis (MTA).</p> <p>IVARA's process for managing asset performance and reliability enables strategic change. <i>Asset Prioritization</i> systematically ranks assets by failure consequence and relative risk. <i>Strategy Selector</i> uses a risk-sensitive approach, to objectively determine the method to develop the best program for assets in their operating context. <i>RCM2</i> leverages the leading RCM standard to mitigate consequences of failure based on the seven questions of RCM. <i>Maintenance Task Analysis</i> (MTA) applies IVARA's accelerated FMEA methodology, Maintenance Tasks Analysis, to define required tasks for less critical assets and achieve full plant coverage faster. <i>Current Practices Review</i> implements condition-based inspections based on an existing program (revisit with MTA or RCM later). <i>Risk-Based Inspections and Integrity Inspection Management</i> addresses both rotating and fixed assets in one application. <i>EXP</i> provides a cohesive platform to conduct consistent and structured risk analyses as well as develop inspection programs aligned with risk. <i>EXP Cloud</i> is an online customer community for sharing failure modes along with the associated maintenance action plans and condition indicators complete with alarm states/thresholds. It is connected to IVARA's <i>EXP MTA</i>.</p> <p>Also available for purchase are extensive content libraries by IVARA Implementation Partner, Management Resources Group and Asset Performance Technologies. Deploy faster and continuously improve by leveraging the expertise of our partners, fellow customers and Ivvara's reliability practitioners.</p>
Reference	http://www.ivara.com/index.php/software/exp-enterprise-modules/reliability-strategy-development/
Current users	<i>Information not provided</i>
Years in existence	<i>Information not provided</i>
Acquisition and maintenance costs	<i>Information not provided</i>

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

Java Document Generating Shell (JDOCSHELL)

Type	Software
Owner/developer	Logistics Support Activity (LOGSA) USAMC LOGSA ATTN: AMXLS-AI (JDOCSHELL) Redstone Arsenal, AL 35898-7466 logsa.logpars@conus.army.mil
Functions	Requirements development and management Acquisition logistics planning Acquisition strategy
Applicable life cycle phases	All
Description	JDOCSHELL is an alternative to the traditional document authoring process. It is designed to generate documents that would benefit from expert system/knowledge base technologies. It provides a structured framework in which to easily represent the latest policy and regulatory guidance, past lessons learned, and best practices validated by recognized subject matter experts. JDOCSHELL permits users to create high-quality, thorough, policy-compliant documents in a fraction of the time exhibited in the traditional, labor-intensive, document development approach. Its use of expert system/knowledge base technologies ensures each document development effort doesn't constitute a total new start.
Reference	https://www.logsa.army.mil/lec/jdocshell/
Current users	U.S. Army, Navy, Air Force, and Marine Corps, Special Operations Command, Federal Aviation Administration, Army Logistics Management College, Department of Agriculture, and the Australian Department of Defence
Years in existence	10
Acquisition and maintenance costs	Cost can be expected to range from \$20,000 to \$100,000

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

LC2

Type	Spreadsheet
Owner/developer	Logistics Management Associates (LMA) Attn: James V. Jones 19 Woodlawn Irvine, CA 92620 USA 949.551.8376 james.v.jones@log-mgmt.com
Functions	Requirements development and management Design support activities Life cycle cost
Applicable life cycle phases	All
Description	<p>Cost of ownership is one of the most important issues driving decisions for projects. LMA has developed a simple, robust approach to address this challenge. LC2 is a spreadsheet-based life-cycle cost (LCC) estimation tool that provides answers to critical issues concerning cost of ownership. LC2 provides the capability to model the effect of design and operation decisions on LCC, through life cost (TLC), and whole life cost (WLC).</p> <p>This model is used extensively by organizations as an integral part of decision-making about product acquisition. It can be used to decide which product to purchase based on potential life costs of ownership, or it can be used to assess performance and support requirements to be included in a procurement specification. LC2 identifies the key issues which impact cost and helps understand how these issues must be considered in the decision-making process.</p>
Reference	http://www.log-mgmt.com/default.asp?p=5000
Current users	DoD and support contractors, NASA
Years in existence	20
Acquisition and maintenance costs	Free of charge

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

Life Cycle Logistics Chart

Type	Document
Owner/developer	Logistics Support Activity (LOGSA)
Functions	Requirements development and management
Applicable life cycle phases	All
Description	The new Life Cycle Logistics Chart is an easy-to-read reference wall chart that focuses on the many issues that must be addressed and activities that must be performed to plan, manage, and implement life cycle logistics and its related elements.
Reference	https://acc.dau.mil/logsa/
Current users	DoD logistics community and support contractors
Years in existence	3
Acquisition and maintenance costs	Free of charge

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

Life-Cycle Sustainment Plan (LCSP)—Sample Outline version 1.0

Type	Document
Owner/developer	Department of Defense Defense Acquisition University DAU-GLTC 9820 Belvoir Road Ft. Belvoir, VA 22060-5565 (703) 805-3459 issc@dau.mil
Functions	Requirements development and management
Applicable life cycle phases	All
Description	<p>The LCSP satisfies sustainment requirements through the delivery of a product support package. Development of a life-cycle product support strategy and plan are critical steps in the delivery of the product support package. The LCSP remains an active management tool throughout the operations and sustainment of the system; and the program must continually update the LCSP to ensure sustainment performance satisfies the user's needs.</p> <p>The contents of this annotated outline are applicable DoD-wide and are intended to stimulate critical thinking about the necessary product support elements required for an effective plan. The program may include, in the annex section, any additional military service-specific requirements and implementation details it deems critical to the delivery of the product support package.</p> <p>The LCSP is expected to evolve throughout the acquisition process with the maturity of the system and clarity for the program's life-cycle product support strategy. It can also be tailored based on varying entry points in the acquisition process.</p>
Reference	https://acc.dau.mil/CommunityBrowser.aspx?id=473039
Current users	DoD
Years in existence	1
Acquisition and maintenance costs	Free of charge

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

MIL-HDBK-502

Type	Document
Owner/developer	Department of Defense DLA Document Services Building 4/D 700 Robbins Avenue Philadelphia, PA 19111-5094 215-697-6396
Functions	Requirements development and management Logistics support analysis
Applicable life cycle phases	All
Description	The focus of this handbook is on providing guidance to the members of the DoD acquisition workforce who are directly concerned with the supportability of materiel systems or automated information systems. It addresses how systems engineering fits into the acquisition process, supportability analyses as part of the systems engineering process, how to develop supportability requirements, the acquisition and generation of support data, logistics considerations for contracts, and the logistician's role on integrated product teams.
Reference	https://assist.daps.dla.mil/quicksearch/basic_profile.cfm?ident_number=201462
Current users	DoD logistics community and support contractors
Years in existence	15
Acquisition and maintenance costs	Free of charge

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

MIL-PRF-49506

Type	Document
Owner/developer	Department of Defense DLA Document Services Building 4/D 700 Robbins Avenue Philadelphia, PA 19111-5094 215-697-6396
Functions	Requirements development and management Logistics support analysis
Applicable life cycle phases	All
Description	This specification describes information required by the government to perform acquisition logistics management functions. The principle focus of this specification is on providing the DoD with a contractual method for acquiring support and support-related engineering and logistics data from contractors. The DoD uses this data in house in existing DoD materiel management processes such as those for initial provisioning, cataloging, and item management. Data products intended primarily for in-house use by the contractor during his/her own design process or those developed internally by the DoD are beyond the scope of this document. Depending on specific program requirements, this information may be in the form of summary reports, a set of specific data products, or both. This specification identifies content requirements for information summaries and format requirement for data products. It may be used on all system/end item acquisition programs. The contractor may, and is encouraged to, suggest alternative means of satisfying requirements of this specification to make information more readily available and to utilize more efficient business practices. The mechanics of delivery (e.g., electronic data interchange, hard copy, etc.) are not within the scope of this specification and should be addressed separately. Data entry media, storage, and maintenance procedures are left to the contractor.
Reference	https://assist.daps.dla.mil/quicksearch/basic_profile.cfm?ident_number=123615
Current users	DoD logistics community and support contractors
Years in existence	16
Acquisition and maintenance costs	Free of charge

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

MIL-STD-1388-1A

Type	Document
Owner/developer	Department of Defense DLA Document Services Building 4/D 700 Robbins Avenue Philadelphia, PA 19111-5094 215-697-6396
Functions	Requirements development and management Logistics support analysis
Applicable life cycle phases	All
Description	This standard provides a uniform approach for conducting those activities necessary to <ul style="list-style-type: none"> ◆ (a) cause supportability requirements to be an integral part of system requirements and design, ◆ (b) define support requirements that are optimally related to the design and to each other, ◆ (c) define the required support during the operational phase, and ◆ (d) prepare attendant data products.
Reference	https://assist.daps.dla.mil/quicksearch/basic_profile.cfm?ident_number=36796
Current users	DoD logistics community and support contractors
Years in existence	19
Acquisition and maintenance costs	Free of charge

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

MIL-STD-1388-2B

Type	Document
Owner/developer	Department of Defense DLA Document Services Building 4/D 700 Robbins Avenue Philadelphia, PA 19111-5094 215-697-6396
Functions	Requirements development and management Logistics support analysis
Applicable life cycle phases	All
Description	This standard prescribes the data element definitions (DED), data field lengths, and formats for logistic support analysis record (LSAR) data. It identifies the LSAR reports that are generated from the LSAR data and identifies the LSAR relational tables and automated data processing specifications for transmittal and delivery of automated LSAR data.
Reference	https://assist.daps.dla.mil/quicksearch/basic_profile.cfm?ident_number=36797
Current users	DoD logistics community and support contractors
Years in existence	21
Acquisition and maintenance costs	Free of charge

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

OmegaPS

Type	Software		
Owner/developer	Pennant +44 (0) 1329 226300 softwaresales@pennantplc.co.uk		
Functions	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;">Design support activities Logistics support analysis Maintenance task analysis Level of repair analysis</td> <td style="width: 50%; border: none;">Spares assessment and provisioning Generation of technical publications Reliability-centered maintenance Life cycle cost</td> </tr> </table>	Design support activities Logistics support analysis Maintenance task analysis Level of repair analysis	Spares assessment and provisioning Generation of technical publications Reliability-centered maintenance Life cycle cost
Design support activities Logistics support analysis Maintenance task analysis Level of repair analysis	Spares assessment and provisioning Generation of technical publications Reliability-centered maintenance Life cycle cost		
Applicable life cycle phases	All		
Description	<p>OmegaPS is a software product used to reduce the support cost of major capital equipment in the defense, aerospace, and transportation markets. The cost of ownership of a major asset is much more than the purchase price. The speed and frequency of maintenance and repair has a substantial effect on overall cost. Integrated Logistic Support (ILS) identifies and minimizes life-cycle costs, by providing better information earlier and can be used to influence design at an early stage.</p> <p>OmegaPS is the world's leading logistics support analysis (LSA) package. OmegaPS conforms to current and previous standards, such as Mil-Std-1388-2B, mandated for defense contracts. OmegaPS provides a complete system for the generation and capture of LSA data and allows engineers to reuse the data for production of technical documentation, provisioning activities, and in-service analysis and assessment of recommended design changes. OmegaPS was developed using Oracle®, ensuring longevity and platform and operating system independence. OmegaPS will operate in a stand-alone, client-server, or web-based architecture. It has been designed by engineers to ensure engineers have a truly integrated user-friendly tool-set that allows them to focus on the job of engineering rather than understanding software and databases. Through user interaction at international user groups, OmegaPS is now recognized as being on the world forefront, supported and maintained by dedicated developers, support personnel, and design engineers. OmegaPS has many time-saving features and with the work-flow navigation system enhanced with an internal "navigator" engineers save hours of laborious data creation and manipulation tasks. Users can work logically to address the various disciplines such as structures, maintenance task analysis, reliability, and failure analysis as well as data uploads, transfers and reporting.</p> <p>OmegaPS is the only LSAR that fully supports Def Stan 00-60 Issue 1, 2, 3 & 4 as well as MIL-STD-1388-2B with the ability to migrate projects between the various standards. In addition, specific modules are available for Canadian Provisioning and Australian Defence Force specifications.</p>		
Reference	http://www.pennantplc.co.uk/pages/omega_desc		
Current users	Boeing, BAE Systems, Alenia Marconi, Thales, GIAT, Northrop Grumman, Lockheed Martin, Eurocopter, as well as government organizations including UK MoD, NAVSEA, TRW, Australian Defence Forces, Canadian DND and Czech Republic MoD		
Years in existence	<i>Information not provided</i>		
Acquisition and maintenance costs	<i>Information not provided</i>		

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

ONeTOOL

Type	Software and handheld device
Owner/developer	O'Neil & Associates, Inc. 495 Byers Road Miamisburg, OH 45342-3662 937.865.0800
Functions	Maintenance data collection, management, and utilization
Applicable life cycle phases	Phase E: Operations and sustainment
Description	The O'Neil ONeTOOL combines the viewing of electronic technical manuals (ETMs) and interactive electronic technical manuals (IETMs), computer-based training (CBT), and built-in test equipment (BIT/BITE) into a single, unrivaled field-support tool. The ONeTOOL uses the output of the BIT/BITE and diagnostic processes from failing equipment and feeds the information into a durable, reliable, and field-ready personal computer. The system determines equipment defects and then guides the operator through the necessary steps to repair or replace failing parts. Downtime is reduced, and mission-critical equipment is put right back where it belongs—operational.
Reference	https://www.onetool.com/
Current users	<i>Information not provided</i>
Years in existence	<i>Information not provided</i>
Acquisition and maintenance costs	\$12,717.17 per ONeTOOL unit

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

Organizational Capability Maturity Model

Type	Document
Owner/developer	CLEP (Council of Logistics Engineering Professionals) finance@logisticsengineers.org
Functions	Requirements development and management Life cycle management
Applicable life cycle phases	All
Description	The model provides a conceptual approach for evaluating the maturity of an organization's processes in the areas of logistics management and logistics engineering services. This guide offers a new approach tool to help quantify an organization's overall logistics engineering effectiveness. It offers a methodology to evaluate a measurable level of logistics performance for supporting program development and operational sustainment throughout a system's planned life cycle.
Reference	http://logisticsengineers.org/?page_id=154
Current users	<i>Information not provided</i>
Years in existence	<i>Information not provided</i>
Acquisition and maintenance costs	<i>Information not provided</i>

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

Type	Software
Owner/developer	CMstat 3960 Howard Hughes Parkway, Suite 500 Las Vegas, NV 89169 877 537-1959 information@cmstat.com
Functions	Configuration management
Applicable life cycle phases	All
Description	<p>CMstat manages the complete flow of product information for your Enterprise providing configuration history from initial development to field maintenance, and supports an orderly transfer of product information through each stage of the product life cycle. It maintains all product information within the Central Database of Authority™.</p> <p>The CMstat data model defines in-depth relationships between related product objects and automates the industry-recognized best practices of configuration management (CM) providing a complete CM software package “out of the box.”</p> <p>CMstat gives you the ability to identify the components of your product and associated documents; monitor status and account for product information through all phases of the lifecycle; implement paperless change and document revision-roll processes—highly visible, synchronized revision shifts that follow proper sequence rules; produce records needed for verification audits; and track product configurations, such as as-designed/built/maintained/tested.</p>
Reference	http://www.cmstat.com/cmstat_directory/software/pdmplus/index.html
Current users	BAE Mobility Systems, BAE Land Systems, The Boeing Company, Canadian Space Agency, Coleman Aerospace, Fleetway, Inc., Florida Turbine Technologies, GD Land Systems, GD SatCom Technologies, GD Amphibious Systems, IMP Aerospace LTD, ITT Industries - Space lift Range Systems, ITT - Advance Engineering & Sciences, Korean Air Force, L-3 Com - GS&ES, LJT, Inc., Lockheed Martin, NASA, Northrop Grumman, Raytheon Systems Company, Raytheon C2IS, Raytheon Canada LTD, SRI International, Stanley Associates, Royal Saudi Air Force, Thales Systems Canada, Thales Raytheon, Trident Research, U.S. Air Force, U.S. Navy
Years in existence	20
Acquisition and maintenance costs	<p>Prices are based on user needs. Prices below are based off a sample quote:</p> <p>\$25,000 for 1 CMstat Server Standard Edition</p> <p>\$3,500 per CMstat user license, \$2,500 per CMwebStat license</p> <p>\$600 per CMview/redline license(2D)</p> <p>\$30,000 per Standard Interface Requirements Template</p> <p>\$10,000 per Data Change Utility, \$10,000 per Database Extraction Utility</p> <p>\$10,000 STEP Translation Export Utility</p> <p>\$15,000 per BPM Advanced Workflow Module (per CPU)</p> <p>20% of total software costs as Annual Support and Maintenance</p> <p>\$30,000 for implementation package (Consulting)</p>

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

Planning Model based on Projection Methodology (PM2)—Continuous

Type	Spreadsheet
Owner/developer	AMSAA (Army Materiel Systems Analysis Activity) amsaa.reltools@us.army.mil
Functions	Requirements development and management Reliability growth planning
Applicable life cycle phases	Phase B: Preliminary design and technology completion Phase C: Final design and fabrication Phase D: System assembly, integration and test, launch and checkout
Description	PM2 Continuous develops a system-level reliability growth planning curve that incorporates the developmental test schedule and corrective action strategy. The planning curve and associated steps serve as a baseline which reliability assessments may be compared against, possibly highlighting the need for reallocation of resources. Unlike the AMSAA Crow Planning Model, the PM2 Continuous model does not have a growth rate parameter, nor is there a comparable quantity. Furthermore, PM2 Continuous utilizes planning parameters that are directly influenced by program management.
Reference	http://www.amsaa.army.mil/ReliabilityTechnology/Planning.html#PM2
Current users	DoD logistics community and support contractors
Years in existence	5
Acquisition and maintenance costs	Free of charge to U.S. government personnel and government support contractors

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

Planning Model based on Projection Methodology (PM2)—Discrete

Type	Spreadsheet
Owner/developer	AMSAA (Army Materiel Systems Analysis Activity) amsaa.reltools@us.army.mil
Functions	Requirements development and management Reliability growth planning
Applicable life cycle phases	Phase B: Preliminary design and technology completion Phase C: Final design and fabrication Phase D: System assembly, integration and test, launch and checkout
Description	PM2 Discrete is the first methodology specifically developed for discrete systems. It also is the first quantitative method available for formulating detailed plans in the discrete usage domain. The model has the same conditions of use as the continuous PM2 model, except for the usage domain. PM2 Discrete utilizes planning parameters that are directly influenced by program management.
Reference	http://www.amsaa.army.mil/ReliabilityTechnology/Planning.html#PM2D
Current users	DoD logistics community and support contractors
Years in existence	5
Acquisition and maintenance costs	Free of charge to U.S. government personnel and government support contractors

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

PowerLOG-J

Type	Software
Owner/developer	Logistics Support Activity (LOGSA) USAMC LOGSA ATTN: AMXLS-AL (powerLOG-J) Redstone Arsenal, AL 35898-7466 (256) 955-9847 logsa.powerlog.help@conus.army.mil
Functions	Design support activities Logistics support analysis Maintenance task analysis Spares assessment and provisioning Maintenance data collection, management, and utilization Generation of technical publications
Applicable life cycle phases	All
Description	PowerLOG-J is an acquisition logistics data management tool that satisfies requirements for the Logistics Management Information and Logistics Support Analysis Record (LSAR). PowerLOG-J has more than 5,500 registered users. It can be used to develop, evaluate, review, and integrate logistics data for materiel systems and generate logistics support summaries, such as the Repair Parts and Special Tools Lists (RPSTL), Maintenance Allocation Chart (MAC), Task Analysis, Provisioning Technical Documentation (LSAR 036), Bill of Materials (LSAR 080), Failure Modes Effects and Criticality Analysis, and another 38 reports (45 logistic product reports in all). Output data in XML format for ETM and IETMS in MIL-STD-2361 and MIL-STD-0007 formats; technical manual reports meet MIL-STD-40051 formats. All reports have XML, HTML, and PDF outputs.
Reference	https://www.logsa.army.mil/lec/powerlog/
Current users	DoD, U.S. Coast Guard, NASA, and other government agencies
Years in existence	8
Acquisition and maintenance costs	PowerLOG-J is available at no cost to all government personnel and their contractors. Foreign governments and contractors are required to work a Foreign Military Sales case to use PowerLOG-J.

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

Product Support Business Case Analysis (BCA) Guidebook

Type	Document
Owner/developer	Department of Defense
Functions	Requirements development and management Design support activities Business case analysis
Applicable life cycle phases	All
Description	<p>The Product Support BCA is a structured methodology and document that aids decision making by identifying and comparing alternatives by examining the mission and business impacts (both financial and non financial), risks, and sensitivities.</p> <p>The Product Support BCA concludes with a recommendation and associated specific actions and an implementation plan to achieve stated organizational objectives and desired outcomes. One principle application of the BCA guidebook is to assist the product support manager (PSM) in identifying the product support strategy that achieves the optimal balance between warfighter capabilities and affordability.</p> <p>The Product Support BCA does not replace the judgment of a decision maker. Rather, it provides an analytic, standardized, and objective foundation upon which credible decisions can be made.</p>
Reference	http://www.acq.osd.mil/log/mr/library/BCA_Guidebook_April2011.pdf
Current users	DoD logistics community and support contractors
Years in existence	1
Acquisition and maintenance costs	Free of charge

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

PSM (Product Support Management) Guidebook

Type	Document
Owner/developer	Department of Defense
Functions	Requirements development and management Product support management
Applicable life cycle phases	All
Description	<p>Program managers (PMs), product support managers (PSMs), and their support staff use this guide as they develop and implement product support strategies for new programs, major modifications to legacy programs, or as they revalidate and re-engineer product support strategies for existing fielded systems.</p> <p>This guide is focused on identifying, developing, implementing, incentivizing, and measuring quantifiable best value outcome based product support strategies that optimize life cycle costs and readiness. It delineates processes for outcome goals of systems, ensures that responsibilities are assigned, provides incentives for attaining these goals, and facilitates the overall life cycle management of system reliability, availability, supportability, and life cycle costs. It seeks to provide an integrated acquisition and sustainment framework for achieving performance requirements throughout a program life cycle.</p>
Reference	http://www.acq.osd.mil/log/mr/library/PSM_Guidebook_April2011.pdf
Current users	DoD logistics community and support contractors
Years in existence	1
Acquisition and maintenance costs	Free of charge

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

RapidAuthor

Type	Software
Owner/developer	Cortona3D 800-971 2812 info@cortona3d.com
Functions	Generation of technical publications Training
Applicable life cycle phases	Phase B: Preliminary design and technology completion Phase C: Final design and fabrication Phase D: System assembly, integration and test, launch and checkout Phase E: Operations and sustainment
Description	<p>Cortona3D RapidAuthor is an authoring suite that gives organizations the flexibility to produce all support documentation (such as interactive parts catalogs, maintenance manuals, training materials and work instructions). With the RapidAuthor tool suite, organizations can reuse existing CAD data or other 3D source material to author interactive 3D visualizations for more effective support documentation. Its intuitive interface enables users with no 3D expertise, to create compelling simulations and associated text simultaneously. Tools in the suite include:</p> <ul style="list-style-type: none"> ◆ RapidManual is an out-of-the-box toolkit for fast and easy production of 3D IETMs/operating procedures/assembly work (installation) instructions, whether for operations, service, maintenance or repair. It uses animated 3D simulations to communicate complex mechanical procedures. 3D manuals encourage visual know-how, minimize translation issues, and improve information retention. ◆ RapidCatalog produces digital, interactive illustrated parts catalogs that use 3D 'explorations' to illustrate complex mechanical assemblies. The interactive 3D environment with drill down navigation improves the experience and eliminates ordering and purchasing errors. It cuts catalog production costs by reusing existing CAD data and produces a better parts catalog that reduces the number of customer support inquiries. ◆ RapidLearning an out-of-the-box learning toolkit for producing digital interactive training applications using animated 3D simulations. It combines existing CAD assets with training documentation to generate visually realistic, interactive learning. RapidLearning guides trainers through the production process, prompting them to illustrate each step of the training scenario with a corresponding 3D animation and build a complete RapidLearning simulation. ◆ RapidWorkInstruction is an out-of-the-box toolkit for fast and easy production of digital interactive work instructions, job cards and assembly instructions. RapidWorkInstruction reuses content directly from engineering CAD, enabling the manufacturing engineer to create the M-BOM and bill of process. Information can be combined and accessed (including CAD drawings, E-BOM and M-BOM, 3D models, data sheets, library parts, health and safety information, photos, etc.) to ensure the work is completed quickly, correctly, and safely. Incorporating 3D animations ensures assembly workers, even in third-party or off-shore locations, know what to do and how to do it.
Reference	http://www.cortona3d.com/Products/RapidAuthor.aspx
Current users	Nipponia, European Space Agency, Logicom, Boeing, MarineSoft, Sukhoi
Years in existence	<i>Information not provided</i>
Acquisition and maintenance costs	<i>Information not provided</i>

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

RCM++

Type	Software
Owner/developer	ReliaSoft Worldwide Headquarters 1450 S. Eastside Loop Tucson, AZ 85710-6703 888-886-0410 ReliaSoft@ReliaSoft.com
Functions	Maintenance task analysis Configuration management Reliability-centered maintenance
Applicable life cycle phases	All
Description	RCM++ provides a flexible and intuitive interface for defining your system configuration and recording the functional failure analysis. The software tool includes configurable equipment selection, failure effect categorization and maintenance task selection capabilities. RCM++ also provides simulation-based calculations that can be used to compare the costs of potential maintenance strategies and a calculator to estimate the optimum maintenance interval for preventive repairs/replacements.
Reference	http://www.reliasoft.com/rcm/
Current users	<i>Information not provided</i>
Years in existence	<i>Information not provided</i>
Acquisition and maintenance costs	New single user license is \$4,995. Design for Reliability Essentials Suite (intended primarily for users focused on product design and development) is available for \$6,995. Reliability, Availability, and Maintainability Essentials Suite (intended primarily for users focused on equipment operation and maintenance) is also available for \$6,995.

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

Reliability Growth Tracking Model–Continuous (RGTM)

Type	Spreadsheet
Owner/developer	AMSAA (Army Materiel Systems Analysis Activity) amsaa.reltools@us.army.mil
Functions	Maintenance data collection, management, and utilization Reliability growth tracking
Applicable life cycle phases	Phase D: System assembly, integration and test, launch and checkout Phase E: Operations and sustainment
Description	The purpose of the AMSAA RGTM is to assess the reliability improvement (within a single test phase) of a system during development, for which usage is measured on a continuous scale. The model may be utilized if individual failure times are known, or if failure times are only known to an interval (grouped data).
Reference	http://www.amsaa.army.mil/ReliabilityTechnology/Tracking.html#RGTM
Current users	DoD logistics community and support contractors
Years in existence	5
Acquisition and maintenance costs	Free of charge to U.S. government personnel and government support contractors

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

Reliability Growth Tracking Model–Discrete (RGTM)

Type	Spreadsheet
Owner/developer	AMSAA (Army Materiel Systems Analysis Activity) amsaa.reltools@us.army.mil
Functions	Maintenance data collection, management, and utilization Reliability growth tracking
Applicable life cycle phases	Phase D: System assembly, integration and test, launch and checkout Phase E: Operations and sustainment
Description	The purpose of the AMSAA RGTM is to track reliability of one-shot systems during development for which usage is measured on a discrete basis, such as trials or rounds.
Reference	http://www.amsaa.army.mil/ReliabilityTechnology/Tracking.html#RGTM
Current users	DoD logistics community and support contractors
Years in existence	5
Acquisition and maintenance costs	Free of charge to U.S. government personnel and government support contractors

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

Reliability Scorecard

Type	Spreadsheet
Owner/developer	AMSAA (Army Materiel Systems Analysis Activity) amsaa.reltools@us.army.mil
Functions	Requirements development and management Reliability assessment
Applicable life cycle phases	All
Description	<p>The AMSAA Reliability Scorecard examines a supplier's use of reliability best practices, as well as the supplier's planned and completed reliability tasks. The Scorecard is important for tracking the achievement of reliability requirements and rating the adequacy of the overall Reliability Program. An early Scorecard assessment may be based solely on a Reliability Program Plan, but as time progresses, the Scorecard assessment will become more accurate if information from technical interchange meetings, a Reliability Case, and results from early reliability tests, are included. The Reliability Case documents the supplier's understanding of the reliability requirements, the plan to achieve the requirements, and a regularly-updated analysis of progress towards meeting the requirements.</p> <p>The AMSAA Software Reliability Scorecard extends and complements the general reliability scorecard by examining an individual software development effort and assessing the level of risk associated with the software reliability practices being applied. It also complements existing software approaches, such as Capability Maturity Model Integration (CMMI), by examining reliability-specific practices within an individual software project.</p>
Reference	http://www.amsaa.army.mil/ReliabilityTechnology/Scorecard.html
Current users	DoD logistics community and support contractors
Years in existence	5
Acquisition and maintenance costs	Free of charge to U.S. government personnel and government support contractors

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

SLIC/2A

Type	Software
Owner/developer	ISS (Integrated Support Systems) Post Office Box 1842 Clemson, SC 29633 800-528-9185 sales@isscorp.com
Functions	Logistics support analysis
Applicable life cycle phases	All
Description	ISS pioneered LSAR software with the powerful SLIC/2A system. SLIC/2A accelerates the logistics process by providing efficient operation, advanced technical capabilities, and flexible options.
Reference	http://www.isscorp.com/html/slic2a.html
Current users	U.S. Army
Years in existence	<i>Information not provided</i>
Acquisition and maintenance costs	<i>Information not provided</i>

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

SLICwave

Type	Software
Owner/developer	ISS (Integrated Support Systems) Post Office Box 1842 Clemson, SC 29633 800-528-9185 sales@isscorp.com
Functions	Logistics support analysis Configuration management Failure modes, effects, and criticality analysis (FMECA)
Applicable life cycle phases	All
Description	<p>SLICwave is the leading through-life supportability analysis software. Featuring analysis capabilities in an extremely flexible, easy-to-use interface, SLICwave enables organizations to realize significant improvements in product supportability. The release of SLICwave v5.2 includes expanded support for the latest supportability standards, plus many enhanced features and capabilities, as well as operating systems upgrades. In addition, v5.2 includes all features and capabilities introduced in Service Packs distributed since the release of SLICwave v5.1.</p> <p>SLICwave hosts a variety of modules and is supported through a variety of services and training opportunities.</p> <p>SLICwave offers numerous data templates, screens, and processes for data entry, including allowing you to integrate and import data seamlessly to/from your other software tools. SLICwave also provides all MIL-STD-1388-2B/LMI reports, plus the GEIA-STD-0007 exchange sets, numerous built-in calculations and data generation utilities, comparative baselining capability, and much more. In other words, SLICwave gives you tools to manage your data effectively and easily.</p>
Reference	http://www.isscorp.com/html/slicwave_overview.html
Current users	BAE Systems, Bell Helicopter Textron, Inc., Boeing, Computer Sciences Corporation, Dassault, General Atomics, General Dynamics, Honeywell International Inc., INDRA sistema, S.A., ITT Corporation, L-3 Communications, Lockheed Martin Corporation, Northrop Grumman, Raytheon, Rolls Royce, SELEX Sistemi Integrati, Thales, United Technologies Inc.
Years in existence	<i>Information not provided</i>
Acquisition and maintenance costs	<i>Information not provided</i>

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

Spacecraft Sustainability Model (SSM)

Type	Software
Owner/developer	LMI 2000 Corporate Ridge McLean VA 22102-7805 (703) 917-7360 rkline@lmi.org
Functions	Requirements development and management Spares assessment and provisioning
Applicable life cycle phases	Phase C: Final design and fabrication Phase D: System assembly, integration and test, launch and checkout Phase E: Operations and sustainment
Description	The SSM Model assesses NASA's ability to meet space shuttle launch schedules based on spare parts and maintenance considerations. The SSM uses detailed shuttle parts data and estimates fleet performance over time. In addition, Logistics Assessments of New Space Systems and Upgrades, an enhancement to the SSM, estimates mass and volume of logistics resources (spare parts, tools, and equipment) for human missions beyond low earth orbit (LEO). Because these missions are still in the early stages of development, they require a model that can estimate logistics requirements from early mission planning data. In addition, the model refines initial estimates as the mission architecture matures.
Reference	http://citrix1.lmi.org/asm/ (link is for LMI Aircraft Sustainability Model, which the SSM is built upon)
Current users	NASA
Years in existence	5
Acquisition and maintenance costs	\$70,000 to \$100,000 (15% is maintenance cost)

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

Subsystem Level Planning Model (SSPLAN)

Type	Spreadsheet
Owner/developer	AMSAA (Army Materiel Systems Analysis Activity) amsaa.reltools@us.army.mil
Functions	Requirements development and management Reliability growth planning
Applicable life cycle phases	Phase D: System assembly, integration and test, launch and checkout
Description	The purpose of SSPLAN is to develop subsystem reliability idealized curves and associated test durations that have the following property: If each growth subsystem grows along its curve for the associated test duration then, with a prescribed probability, the realized subsystem test data will demonstrate a stated system Mean Time Between Failure value at a specified statistical confidence level.
Reference	http://www.amsaa.army.mil/ReliabilityTechnology/Planning.html#SSPLAN
Current users	DoD logistics community and support contractors
Years in existence	5
Acquisition and maintenance costs	Free of charge to U.S. government personnel and government support contractors

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

Subsystem Level Tracking Model (SSTRACK)

Type	Spreadsheet
Owner/developer	AMSAA (Army Materiel Systems Analysis Activity) amsaa.reltools@us.army.mil
Functions	Maintenance data collection, management, and utilization Reliability growth tracking
Applicable life cycle phases	Phase D: System assembly, integration and test, launch and checkout Phase E: Operations and sustainment
Description	The purpose of SSTRACK is to assess system level reliability from the use of component, or subsystem, test data. SSTRACK is a continuous model, but it may be used with discrete data if the number of trials is large and the probability of failure is small.
Reference	http://www.amsaa.army.mil/ReliabilityTechnology/Tracking.html#SSTRACK
Current users	DoD logistics community and support contractors
Years in existence	5
Acquisition and maintenance costs	Free of charge to U.S. government personnel and government support contractors

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

Systems Planning and Requirements Software (SYSPARS)

Type	Software
Owner/developer	Logistics Support Activity (LOGSA) USAMC LOGSA ATTN: AMXLS-AI (SYSPARS) Redstone Arsenal, AL 35898-746 (256) 955-9847 logsa.syspars@conus.army.mil
Functions	Requirements development and management Acquisition strategy Acquisition logistics planning Product support management Business case analysis
Applicable life cycle phases	All
Description	SYSPARS is a tri-service expert system that helps program managers and integrated logistics support managers prepare integrated logistics support, supportability planning, and other acquisition and program management documentation. The program management planning process for modern government acquisition programs requires in-depth knowledge of many functional specialties. Resource shortages and lack of expertise and training contribute to inadequate planning and inappropriate specification of requirements. SYSPARS is designed to enhance productivity and accuracy in program management planning and performance by leading the user through a series of questions designed to establish program management and supportability strategy and develop the associated tailored program planning documentation. Through tailored interactive question and answer sessions, SYSPARS assists the user in systematically considering all issues pertinent to his or her acquisition program. The decision networks embedded within SYSPARS lead the user through the maze of supportability issues to be considered. Automated consistency checks also help the user avoid inconsistencies in document generation.
Reference	https://www.logsa.army.mil/lec/syspars/
Current users	U.S. Army
Years in existence	20+
Acquisition and maintenance costs	Free of charge, registration is required

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

System Level Planning Model (SPLAN)

Type	Spreadsheet
Owner/developer	AMSAA (Army Materiel Systems Analysis Activity) amsaa.reltools@us.army.mil
Functions	Requirements development and management Reliability growth planning
Applicable life cycle phases	Phase D: System assembly, integration and test, launch and checkout
Description	The purpose of SPAN is to construct an idealized system reliability growth curve and determine an associated test duration that has the following property: If the system grows along the idealized curve for the associated test duration, then, with a prescribed probability, the system-level growth test data realized over the test period will demonstrate a stated mean time between failure value at a specified statistical confidence level.
Reference	http://www.amsaa.army.mil/ReliabilityTechnology/Planning.html#SPLAN
Current users	DoD logistics community and support contractors
Years in existence	5
Acquisition and maintenance costs	Free of charge to U.S. government personnel and government support contractors

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

Threshold Program Model

Type	Spreadsheet
Owner/developer	AMSAA (Army Materiel Systems Analysis Activity) amsaa.reltools@us.army.mil
Functions	Requirements development and management Reliability growth planning
Applicable life cycle phases	Phase D: System assembly, integration and test, launch and checkout Phase E: Operations and sustainment
Description	The purpose of the Threshold Program is to determine whether the reliability of a system at selected program milestones is failing to progress according to the idealized growth curve established prior to the start of the growth test. The program can be used to compare a reliability point estimate (based on actual failure data) against a theoretical threshold value.
Reference	http://www.amsaa.army.mil/ReliabilityTechnology/Planning.html#TP
Current users	DoD logistics community and support contractors
Years in existence	5
Acquisition and maintenance costs	Free of charge to U.S. government personnel and government support contractors

Return to Appendix B. Table of Tools by Life Cycle Phase.

Return to Appendix C. Index of Tools by Function.

APPENDIX B. TABLE OF TOOLS BY LIFE-CYCLE PHASE

Table B-1 identifies the applicable NASA life-cycle phases for each tool in the survey. The phases are listed along the first row. The phases address all parts of the project life-cycle. In Pre-Phase A, NASA personnel study concepts for meeting the requirement. The project is refined and development is completed in Phases A, B, C, and D. The asset enters operational use in Phase E, and closeout occurs in Phase F.

Table B-1. NASA Life Cycle Phases by Tool

Tool name (page number)	Pre-Phase A	Phase A	Phase B	Phase C	Phase D	Phase E	Phase F
Air Force Acquisition Sustainment Tool Kit (ASTK) (p. A-1)	X	X	X	X	X	X	X
Air Force Logistics Health Assessment (LHA) (p. A-2)	X	X	X	X	X	X	X
Aircraft Sustainability Model (ASM) (p. A-3)				X	X	X	
ALE Tools & Modeling (p. A-4)	X	X	X	X	X	X	X
AMSAA Crow Planning Model (MH189) (p. A-5)			X	X	X		
AMSAA Crow Projection Model (ACPM) (p. A-6)			X	X	X		
AMSAA Maturity Projection Model (AMPM) (p. A-7)				X	X	X	
Arbortext Provisioning Manager (p. A-8)		X	X	X	X		
Automated Cost Estimating Integrated Tools (ACEIT) (p. A-9)	X	X	X	X	X	X	X
CATLOC Version 6 (p. A-10)	X	X	X	X	X	X	X
Clockwork COMMAND® (p. A-11)						X	
Clockwork DEMAND® (p. A-12)				X	X	X	
Clockwork DESIGN® (p. A-13)		X	X	X	X	X	
COMPASS (p. A-14)		X	X	X			
COMPASS LITE (p. A-15)		X	X	X			
CORENA IETP/IETM (p. A-16)			X	X	X	X	
Cost Analysis Strategy Assessment (CASA) (p. A-17)	X	X	X	X	X	X	X
Defense Acquisition Guidebook (DAG) (p. A-18)	X	X	X	X	X	X	X
DoD Life Cycle Management Framework (p. A-19)	X	X	X	X	X	X	X
Draft ILA Guidebook (p. A-20)			X	X	X		
EAGLE ASENT™ (p. A-21)		X	X	X	X	X	
EAGLE LSAR (p. A-22)	X	X	X	X	X	X	X
EAGLE MMIS™ (p. A-23)						X	
E-IML (Integrated Maintenance Logistics) (p. A-24)						X	
eLORA (p. A-25)		X	X	X			
eMRD (p. A-26)	X	X	X	X	X	X	X
Enterprise Inventory Optimization (EIO) (p. A-27)			X	X	X	X	

Table B-1. NASA Life Cycle Phases by Tool

Tool name (page number)	Pre-Phase A	Phase A	Phase B	Phase C	Phase D	Phase E	Phase F
EPOCH Data Management (DM) (p. A-28)	X	X	X	X	X	X	X
GEIA-HB-0007 (p. A-29)	X	X	X	X	X	X	X
GEIA-STD-0007 (p. A-30)	X	X	X	X	X	X	X
Interactive Authoring & Display System (IADS) (p. A-31)			X	X	X	X	
InSync (p. A-32)	X	X	X	X	X	X	X
IVARA EXP Reliability Strategy Development (p. A-33)		X	X	X			
Java Document Generating Shell (JDOCSHELL) (p. A-34)	X	X	X	X	X	X	X
LC2 (p. A-35)	X	X	X	X	X	X	X
Life Cycle Logistics Chart (p. A-36)	X	X	X	X	X	X	X
Life-Cycle Sustainment Plan (LCSP)—Sample Outline version 1.0 (p. A-37)	X	X	X	X	X	X	X
MIL-HDBK-502 (p. A-38)	X	X	X	X	X	X	X
MIL-PRF-49506 (p. A-39)	X	X	X	X	X	X	X
MIL-STD-1388-1A (p. A-40)	X	X	X	X	X	X	X
MIL-STD-1388-2B (p. A-41)	X	X	X	X	X	X	X
OmegaPS (p. A-42)	X	X	X	X	X	X	X
ONeTOOL (p. A-43)						X	
Organizational Capability Maturity Model (p. A-44)	X	X	X	X	X	X	X
PDM ^{Plus} (p. A-45)	X	X	X	X	X	X	X
Planning Model based on Projection Methodology (PM2)—Continuous (p. A-46)			X	X	X		
Planning Model based on Projection Methodology (PM2)—Discrete (p. A-47)			X	X	X		
PowerLOG-J (p. A-48)	X	X	X	X	X	X	X
Product Support Business Case Analysis (BCA) Guidebook (p. A-49)	X	X	X	X	X	X	X
PSM (Product Support Management) Guidebook (p. A-50)	X	X	X	X	X	X	X
RapidAuthor (p. A-51)			X	X	X	X	
RCM++ (p. A-52)	X	X	X	X	X	X	X
Reliability Growth Tracking Model—Continuous (RGTCM) (p. A-53)					X	X	
Reliability Growth Tracking Model—Discrete (RGTCMD) (p. A-54)					X	X	
Reliability Scorecard (p. A-55)	X	X	X	X	X	X	X
SLIC/2A (p. A-56)	X	X	X	X	X	X	X
SLICwave (p. A-57)	X	X	X	X	X	X	X
Spacecraft Sustainability Model (SSM) (p. A-58)				X	X	X	
Subsystem Level Planning Model (SSPLAN) (p. A-59)					X		
Subsystem Level Tracking Model (SSTRACK) (p. A-60)					X	X	

Table B-1. NASA Life Cycle Phases by Tool

Tool name (page number)	Pre-Phase A	Phase A	Phase B	Phase C	Phase D	Phase E	Phase F
Systems Planning and Requirements Software (SYSPARS) (p. A-61)	X	X	X	X	X	X	X
System Level Planning Model (SPLAN) (p. A-62)					X		
Threshold Program Model (p. A-63)					X	X	

Note: Pre-Phase A: Concept studies
Phase A: Concept and technology development
Phase B: Preliminary design and technology completion
Phase C: Final design and fabrication
Phase D: System assembly, integration and test, launch and checkout
Phase E: Operations and sustainment
Phase F: Closeout

APPENDIX C. INDEX OF TOOLS BY FUNCTION

Acquisition logistics planning.....	A-34, A-61
Acquisition strategy	A-34, A-61
Business case analysis.....	A-49, A-61
Configuration management.....	A-22, A-32, A-45, A-52, A-57
Contract data requirements list (CDRL).....	A-28
Cost analysis	A-9, A-10
Cost estimate development and documentation.....	A-9
Design support activities.....	A-10, A-13, A-18, A-22, A-26, A-35, A-42, A-48, A-49
Failure modes, effects, and criticality analysis (FMECA).....	A-57
Failure rate prediction.....	A-21
Failure reporting, analysis, and corrective action system.....	A-21
Generation of technical publications	A-8, A-12, A-16, A-22, A-24, A-31, A-42, A-48, A-51
Independent logistics assessment.....	A-20
Inventory management.....	A-27
Level of repair analysis.....	A-4, A-14, A-15, A-25, A-42
Life cycle cost.....	A-4, A-10, A-17, A-35, A-42
Life cycle management.....	A-2, A-32, A-44
Logistics assessment	A-2
Logistics support analysis.....	A-1, A-4, A-10, A-13, A-17, A-21, A-22, A-26, A-29, A-30, A-38, A-39, A-40, A-41, A-42, A-48, A-56, A-57
Maintenance data collection, management, and utilization.....	A-6, A-7, A-11, A-12, A-13, A-21, A-23, A-24, A-26, A-43, A-48, A-53, A-54, A-60
Maintenance task analysis.....	A-12, A-13, A-22, A-26, A-33, A-42, A-48, A-52

Performance-based logistics	A-23
Product support management.....	A-50, A-61
Reliability assessment.....	A-55
Reliability growth planning	A-5, A-46, A-47, A-59, A-62, A-63
Reliability growth projection	A-6, A-7
Reliability growth tracking	A-53, A-54, A-60
Reliability, maintainability, and testability analysis.....	A-21
Reliability-centered maintenance.....	A-33, A-42, A-52
Requirements development and management	A-1, A-2, A-3, A-5, A-13, A-18, A-19, A-23, A-29, A-30, A-34, A-35, A-36, A-37, A-38, A-39, A-40, A-41, A-44, A-46, A-47, A-49, A-50, A-55, A-58, A-59, A-61, A-62, A-63
Risk management.....	A-10
Sensitivity analysis.....	A-10
Spares assessment and provisioning	A-3, A-8, A-12, A-22, A-27, A-42, A-48, A-58
Total ownership cost estimating	A-17
Training.....	A-51
Uncertainty analysis.....	A-9