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DT&E Forum for Best Practices and Lessons Learned

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**DT&E Forum for Best Practices and
Lessons Learned**

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Executive Summary

The Deputy Assistant Secretary of Defense for Developmental Test and Evaluation [DASD(DT&E)] tasked IDA to “collect, organize, and assess best practices and lessons learned (BPLL) for performing and supporting DT&E by government and industry; provide tools for DASD(DT&E) staff specialists, program offices, and test organizations to provide faster response in DT&E planning and execution; and provide an organized, easily accessible, and interactive web-based DoD-level repository of T&E BPLL available for the acquisition and T&E communities.”¹

The task involved several distinct subtasks. First, we collected lessons learned and best practices from previous experiences and derived or adapted best practices for general use. Next, we developed the necessary software and protocols to establish the DT&E Forum website on a webserver operated by the Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics [OUSD(AT&L)]. Finally we assessed the potential for the DT&E Forum to be the model for DT&E’s Internal Website. This paper describes our approach, the activities used to carry out the tasking, and the results obtained.

Collection of Material and Development of Best Practices

The purpose of this subtask was to research and analyze best practices and lessons learned materials from various sources and, from that material, to derive “Best Practices” that would be useful in the planning, execution, evaluation, and reporting of DT&E for DoD acquisition and development programs. The final aspect of the subtask was to format the information so it would be suitable for posting to and accessing from the DT&E Forum website hosted by OUSD(AT&L). This subtask required the team to:

- Research and acquire T&E best practices and lessons learned from Components, industry, professional associations, the Government Accounting Office (GAO), and the Defense Acquisition University (DAU) Best Practices Clearinghouse.
- Interview DT&E staff specialists, test centers, and representative program management offices to collect experiences on T&E best practices and lessons learned, as well as draw on the experiences of IDA team members.

¹ IDA Task Order AX-1-3334, “Best Practices and Lessons Learned for Deputy Assistant Secretary of Defense for Developmental Test and Evaluation.”

The effort began with a review of approximately 30 “lessons learned” documents provided by the sponsor. From this review, the team derived an initial set of Best Practices. This review also led to the establishment of a standardized format for Best Practices and the development of a taxonomy for organizing them. The format included a unique, action-oriented title; a bulleted checklist of best practice actions; the lesson(s) learned that led to development of the best practice; hyperlinks to sources from which material was drawn; and the milestone or phase of the DT&E process to which the best practice relates. The taxonomy was divided between topics pertinent to assisting program offices and test program planners structure their acquisition and development programs to get them through the Defense Acquisition System milestones; and those to aid testers in developing and executing test plans for commodities in warfare areas such as munitions and armaments, ground vehicles, air platforms, sea vehicles, space platforms, nuclear technology, battlespace environments, and information systems.

The team followed this initial effort by assembling more than 250 documents related to DT&E lessons learned and best practices. These documents, along with information collected in interviews and applicable experience residing in the team, were used to draft a large number of candidate best practices, which were vetted by both the team and others at IDA. From this vetting, the team selected an initial set of 76 for sponsor review. These reviews were attended by several levels of DASD(DT&E) management including the Principal Deputy Director, the Military Assistant, Deputy Directors, and staff specialists. Of the 76, 24 were selected for final posting on the DT&E Forum for beta testing with the DT&E community. An abbreviated example of a best practice, showing the format, is provided below.

In the course of developing the Best Practices, two overarching findings stood out. First, there is a significant need for collecting and making available additional best practices including a number of which are suggested in this report. Second, from discussions with people actually engaged in DT&E efforts including field test organizations and DASD(DT&E) staff specialists, “planning factors” emerged as an area of high interest and needs additional and continued development for use in building evaluation frameworks for test program schedules, resource planning, and costs in Test and Evaluation Master Plans. They indicated that a key element in such a framework is the planning factors used by program offices to scale analogous historical test program data for current programs.

BP 11 – 015: Establish a Test and Evaluation Working-Level Integrated Product Team (T&E WIPT)

A. Best Practice

Charter a T&E WIPT to advise and develop the T&E program for TEMPs and acquisition strategies, cost and schedule planning

As early in an acquisition program, preferably at the onset of a materiel solution decision, the program office should charter a T&E WIPT..... with, as a minimum, the following representative membership:

- The designated Government Lead DT&E Organization (external to and independent of the program office)
-

B. Rationale (Lessons Learned)

A T&E WIPT was chartered to support the Biometrics Automated Toolset (BAT), field tested in Kosovoattributed for the successful rapid response of this program and the eventual adoption of the capabilities by other government agencies.

C. Sources

- “Shaping the Way Ahead: Army Biometrics WIPT Kickoff,” *Defense AT&L*, July-August 2011, pp. 27-32, by Nicole Daniel, Kevin Trissell, and Richard Hansen.
-

Suggested Key Words: T&E WIPT; Working Level Integrated Product Team; IPT; Integrated Product Team; acquisition strategy; contract, technology development strategy; AoA; Request for Proposal; RFP; Statement of Work; SOW; Contract Data Requirements List; CDRL

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Acquisition Milestone/Phase Actions, Requirements/Materiel Solutions Phase, T&E WIPT

Abbreviated Example of a Best Practice Showing the Structure

Development of the DT&E Forum Website

The second subtask was to develop a website containing the DT&E documents and other relevant DT&E information and to provide two-way communications between the Office of the DASD(DT&E) [ODASD(DT&E)] and those who are conducting DT&E activities in the field.

Meant to act as a worldwide source of information pertinent to the DT&E effort and to be accessed using a Common Access Card (CAC) login from any location having Internet connectivity, the DT&E Forum is also intended to provide a means for those engaged in DT&E activities to bring to the attention of ODASD(DT&E) applicable information which, in the user's opinion, should be added to that already in the DT&E Forum.

The DT&E Forum is currently running on an AT&L server at <https://ebiz.atl.osd.mil/DTE-Forum/>. Its home page provides users with direct access to the main functions of the website including locating BPLL documents contained in its database; enabling users to suggest additional BPLL documents; enabling users to track the disposition of their own input; displaying announcements, blogs, and links to other DT&E resources; and providing a means to contact DASD(DT&E) directly.

Potential for the DT&E Forum to Be the Model for DT&E's Internal Website

As the task was nearing completion the website development team was asked the degree to which the DT&E Forum website could be expanded to provide additional services internal to the ODASD(DT&E). Specifically, how difficult would it be to make the transformation? Although the team did not have the resources to answer this question in depth, it was able to take the following steps to show the value of using the current DT&E Forum website as the basis for a DT&E internal website and the ease with which the transformation could be done.

First, the BPLL application was separated from the website code and a DT&E internal website home page, an example of which is shown below,² was added. The BPLL application was then connected to the BPLL Documents button on the DT&E internal website home page.

Next, a quick review of ongoing tasks at IDA identified eight for DT&E in addition to development of the BPLL documents and website task. These include tasks for air warfare, land warfare, naval warfare, space and ballistic missile defense, and cyber and information systems as well as special projects for the Principal Deputy, DT&E.

² It should be noted that the layout of this home page is for demonstration purposes only.

As a final step, the team designed initial applications to display data from a number of the identified ongoing tasks. Where resources permitted, the applications were added to the revised Forum website. The revised website was then placed on IDA's developmental server so that DT&E personnel could access and examine it.^{3,4}



DT&E Forum's Home Page

³ The buttons on the figure titled “Example of a DT&E Internal Website Home Page” that are underlined with a solid line have an example application associated with them. Where an application was designed, but not yet incorporated into the website, the underlining is dashed. The lines are for illustration only.

⁴ Each application contains a library with easy-to-set access controls available for each document. One control allows the document to be shared via the website's library.



Example of a DT&E Internal Website Home Page

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1. Background, Objective, Approach, and Schedule

A. Background and Objective

DASD(DT&E) tasked IDA to create an organized, easily accessible, interactive, web-based, repository of best practices and lessons learned (BPLL) for planning, executing, resourcing, executing, reporting, and reviewing developmental test and evaluation (DT&E) activities. The purpose is to provide DASD(DT&E) staff specialists, program offices, and test organizations with rapid access to materials pertinent to their tasks to accomplish them in the most efficient and effective manner by drawing on experiences of others. Furthermore, it provides users with a collaborative structure to harvest and share their best practices and lessons learned and to suggest improvements to current ones.

As part of this effort, the team collected, organized, and assessed those BPLLs necessary for Government and industry to perform and support DT&E. The team also provided tools for DASD(DT&E) staff specialists, program offices, and test organizations to permit faster response in DT&E planning and execution.

The resulting repository for BPLLs is hosted on a webserver operated by the Office of the Under Secretary of Defense (Acquisition, Technology & Logistics) (OUSD(AT&L)) under the name “DT&E Forum” for which IDA developed the coding and protocols for adapting to the presentation and security requirements.

B. Approach

This effort had four broad phases: BPLL data collection; analysis and organization of the collected data; development of best practices based on the collected data along with experiences of team members; and development of an interactive, web-based, DoD-level repository capable of storing and providing access to stored BPLL documents. These phases are described in Table 1-1.

Table 1-1. Four Phases of Task

Phase	Subtasks
Data Collection	Research and acquire DASD(DT&E) best practices and lessons learned from Components, industry, and professional associations.
	Interview DT&E staff specialists and representative program management offices to collect experiences on DT&E best practices and lessons learned and further define requirements for how to present information so that it would be most useful.
	Research relevant and existing program and other documentation to include Test and Evaluation Master Plans (TEMPs), acquisition strategies, requests for proposal, studies, etc., to locate and acquire best practices and lessons learned for performing DT&E.
	Analyze Defense Acquisition University (DAU) Best Practices Clearinghouse website to identify material relevant to this effort including collection methods of T&E best practices.
Data Analysis and Organization	Provide analysis and recommendations of T&E best practice collection methods and how DASD(DT&E) might leverage existing processes in a DoD-level tool.
	Provide analysis and recommendations of a user-friendly taxonomy of T&E best practices and lessons learned, based on information from the above tasks, to be established on a DT&E website.
	Taxonomy should be applicable for preparation of and use in oversight of T&E program documentation to include TEMP, acquisition strategies, requests for proposals, etc.
Development of Best Practice Documents	Use the material collected in the above tasks along with the applicable team experiences to develop best practices documents.
	Review the documents with selected DT&E management.
	Enter approved best practices documents into the web-based repository.
Development and Refinement of a DT&E Web-Based Repository	Design, develop, test, and demonstrate a prototype web-based BPLL site that can be hosted on the DT&E website. The BPLL site is to be searchable and provide links to relevant resources [e.g., Society of Experimental Test Pilots (SETP) website, Test Resource Management Center (TRMC) Test Capability Directory, etc.]. Provide best practices and lessons learned content in approved taxonomy of task above. The prototype shall be hosted on the IDA interoperability decision support system (IDSS) network during the development phase with versions to be put onto the DT&E website.
	Provide and implement a feedback tool on the BPLL site to include both a feedback mechanism for the site itself and a user-friendly method for suggesting new T&E best practices and lessons learned.
	Continuously modify the prototype site as directed by the DASD(DT&E) point of contact (POC).
	At the direction of the DASD(DT&E) POC, aid DT&E in transforming the prototype to enable it to be hosted on the DT&E website.
	Respond to internal and external user feedback and implement changes per DASD(DT&E) direction.
Schedule and Deliverables	Provide briefings on document and website development as requested.
	Provide demonstrations of the website as requested.
	By September 30, 2012, enter approved BPLL documents into updated prototype BPLL website and go "live."

2. Lessons Learned and Best Practices

This chapter describes the steps taken to derive and format BPLLs suitable for posting to and accessing from the DT&E Forum website.

A. Collection of Lessons Learned and Best Practices

We began the effort by reviewing approximately 30 “lessons learned” documents provided by DASD(DT&E), from which we derived our first set of Best Practices, standardized a format, and developed a taxonomy for organizing them. We assigned specific documents to team members with the most appropriate experience or knowledge to derive best practices for use by DT&E personnel in acquisition program offices, test organizations, and staff specialists in the Office of the DASD(DT&E). This was followed by researching and collecting additional lessons-learned documents from the IDA archives and library. This endeavor produced more than 250 documents from sources such as the Government Accountability Office (GAO), Defense Science Board (DSB), DoD contractors, and non-DoD industry; DoD and other Government agency special studies; professional society publications, forums, briefings, and podcasts such as the Society of Experimental Test Pilots (SETP), International Test and Evaluation Association (ITEA), American Institute of Aeronautics and Astronautics (AIAA), U.S. Naval Institute, and Association of U.S. Army; and commercial publications such as *Aviation Week*. This was followed by interviews with DASD(DT&E) staff specialists, and on-site visits to test organizations such as the Air Force Flight Test Center at Edwards AFB, NAVAIR Aircraft Division Patuxent Naval Air Station, 46th Test Wing at Eglin AFB, the Air Force Operational Test and Evaluation Command at Kirtland AFB, and the Weapons System Evaluation Program (WSEP) Program at Tyndall AFB. We also sent a representative to the annual meeting of the SETP, which we found to be an excellent source of lessons learned. We held meetings with Office of the DASD(DT&E) deputies and staff specialists to get their ideas of issues and topics they would like to see covered in best practices.

B. Development of Best Practices

Having collected lessons learned and, in some cases, suggested best practices from experiences of our IDA team members, the next step was to determine which would be the most useful in deriving best practices for the DT&E community; i.e., would have the greatest payoff. For example, we asked if the lessons learned were likely to (1) be beneficial to all, or at least applicable to certain classes of, DT&E programs; (2) result in cost savings or avoidances by improving efficiency and effectiveness of planning,

performing, evaluating, and reporting DT&E early in the program to detect design and function flaws when it is least expensive to correct them (i.e., preproduction); and (3) save acquisition program schedule time by reducing TEMP approval iterations and testing rerun requirements.

We found all best practices generally could be grouped under one of two categories:

- Technical test procedures for use by test or evaluation planners such as the Lead Developmental Test and Evaluation Organizations (LDTOs), and Integrated Test Teams (ITTs) organized by Defense Technology Area Plan (DTAP) warfare area.
- Management/administrative topics for use by DT&E planners in program offices, the Chief Developmental Tester, T&E Working Level Integrated Product Teams (T&E WIPT), and staff specialists in Headquarters and OSD functions, organized according to Acquisition Milestone or Phase, and consisting of checklists of actions that should be taken or avoided.

Within the resources provided under this task, of the 24 Best Practices accepted for use on the Demonstration DT&E Forum, a majority are for Acquisition Milestone/Phase. It is recommended to eventually populate the taxonomy to cover all aspects of DT&E by deriving best practices from one or more lessons learned that could be mapped to either procedures for performing DT&E in each of the major warfare areas, or for proceeding through the Defense Acquisition System milestone/phase model.¹ The taxonomy is shown in Figure 2-1.²

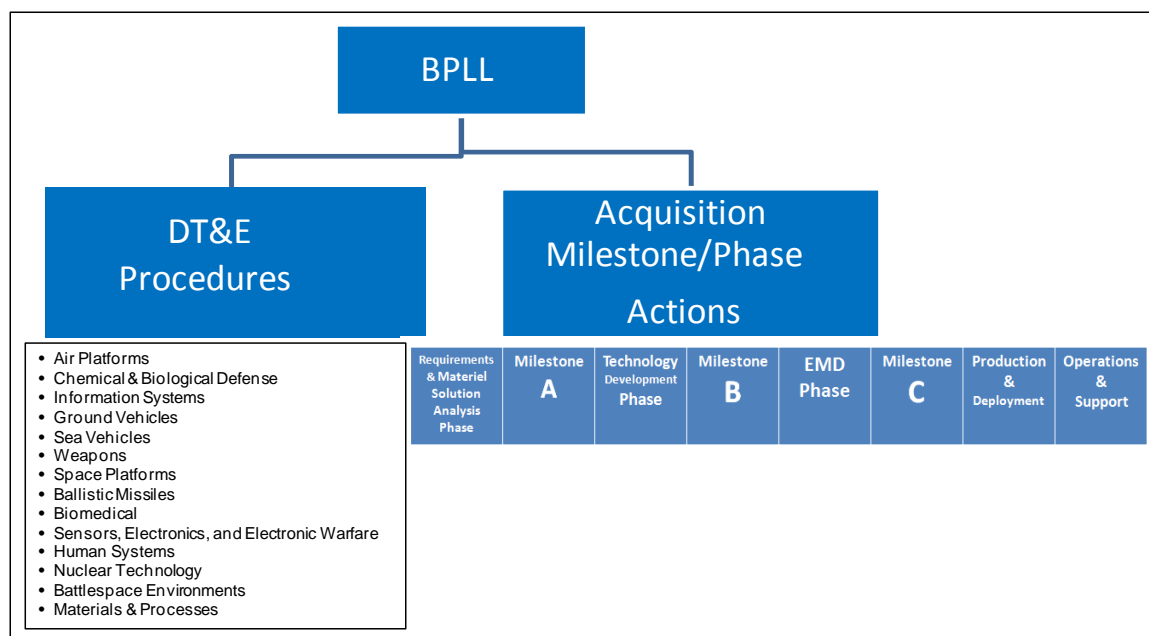


Figure 2-1. Taxonomy for Mapping Best Practices and Lessons Learned

¹ DoDI 5000.02, *Operation of the Defense Acquisition System*, dated December 2, 2008.

² The DT&E Procedure Information Systems includes communications.

As an example,³ we derived a best practice (BP11-15) based on lessons learned about the value of early involvement of DT&E personnel in a “Test and Evaluation Working-Level Integrated Product Team (T&E WIPT)” to assist an acquisition program office in developing their Acquisition Strategy during the “Requirements and Materiel Solutions Analysis” phase of a new acquisition program. We envisioned it could be mapped or “binned” to this taxonomy as shown in Figure 2-2.

For both categories, we developed a format for presenting the best practices, which is shown in Figure 2-3.

As exemplified in Appendix A, each best practice has been assigned a unique alphanumeric designation representing the fiscal year in which it was initially developed, that is “BP11-015” for 2011, and an action oriented title “Establish a Test and Evaluation Working-Level Integrated Product Team (T&E WIPT).” The title is followed by short action statement (in bold) of the main thrust of the derived best practice followed by specific actions (in bullet form) that can enact the best practice. “Rationale” contains the specific lessons learned from which the best practice was derived. “Sources” are the names of the documents in which the lessons learned were found, and they are hyperlinked to those documents for further detail. “Suggested Key Words” are used to aid in searches for the topic, with bolded key words referring to words in the title or the best practice statement, and those not bolded are other relevant or equivalent words used in the remainder of the text for the best practice or in the rationale. “Author,” “Date,” and “Bin Descriptor” may be hidden on the DT&E Forum website but are available for use in follow-up interactive features such as the blog.

³ The details of this example are shown in Appendix A.

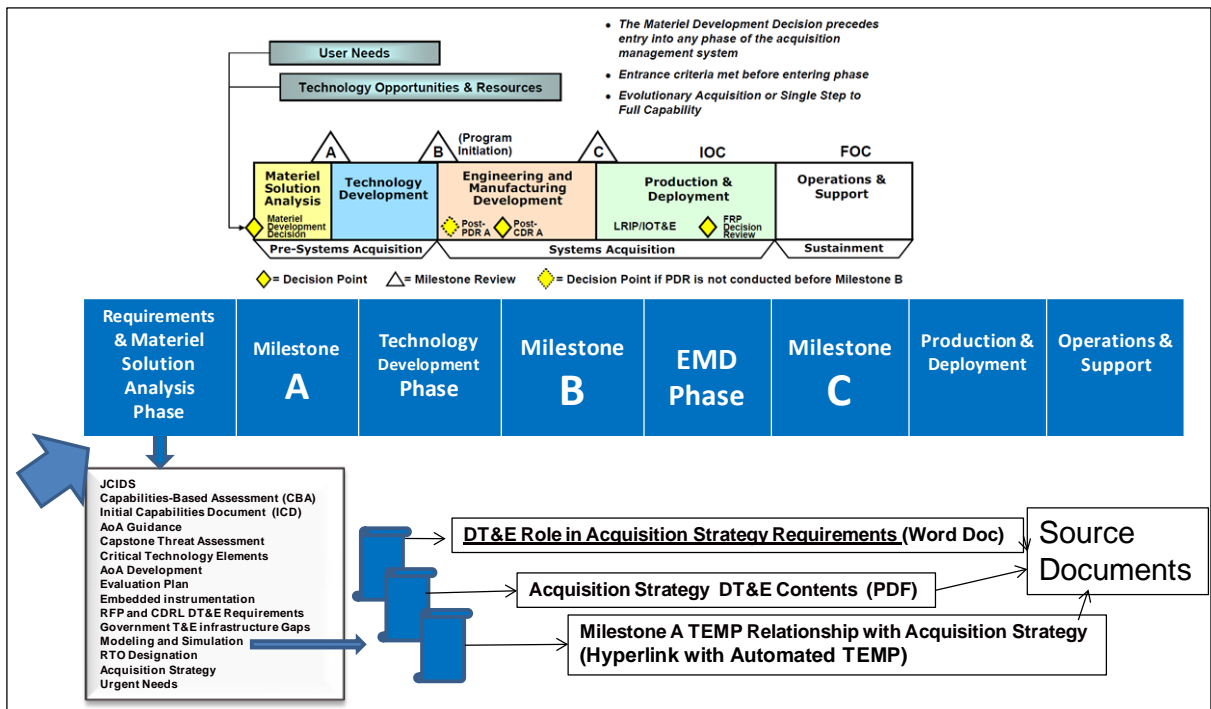


Figure 2-2. Example of Mapping a T&E WIPT to Acquisition Strategy Best Practice

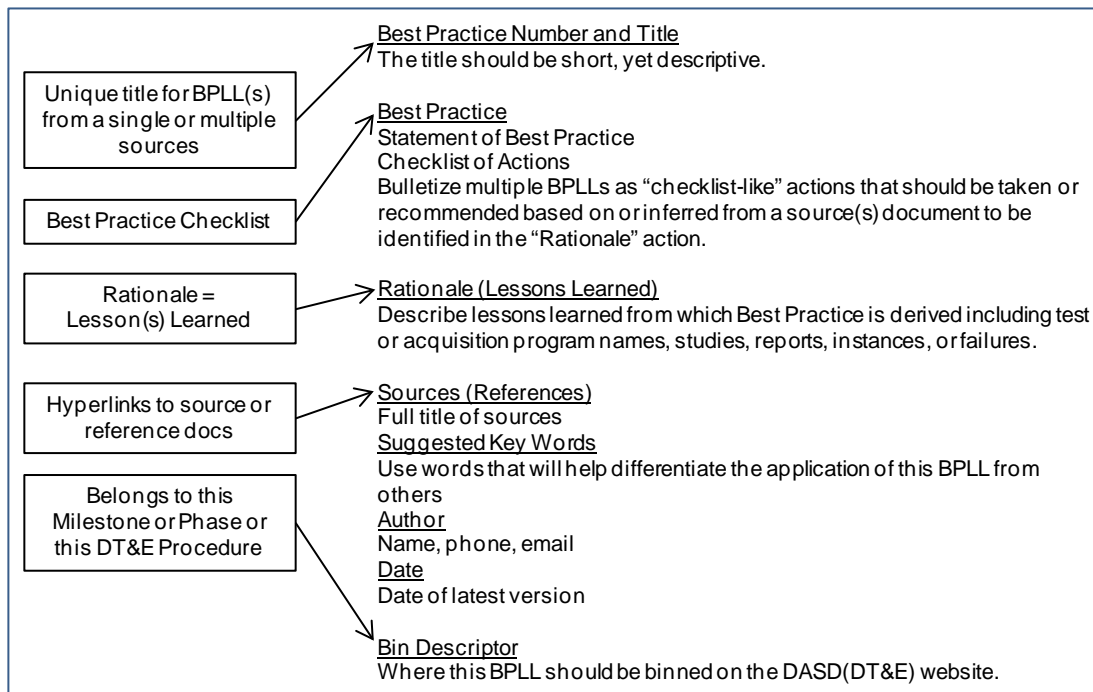


Figure 2-3. Example of Best Practice Format

We established the following guidelines for authors in preparation of each best practice:

- Short and concise statements (checklist style) should be used when describing:
 - What should be tested and how

- Actions that should be taken per Defense Acquisition System milestone and phase
- Style
 - Written for young and inexperienced readers
 - Checklist of best practices
 - One or two paragraphs of rationale (lessons learned)
 - Attribution to source
 - Hyperlinked words or document titles to:
 - Source and reference documentation
 - More information
- Keywords (used for fast search)
 - Those that most accurately describe the topic should be bolded.
 - Those that appear somewhere in the document and therefore might indirectly lead a reader to this best practice should not be bolded.

C. Best Practices Vetting and Posting on the DT&E Forum

After internal IDA vetting, 76 best practices were considered worthy of further vetting by the DASD(DT&E) Military Assistant and the Program Assessment Deputy Directors. Of these, 24 were selected for final posting on the DT&E Forum for beta testing with the T&E community. Summaries of final best practices and those that were in process at the conclusion of the task are in Appendix B. A glossary of acronyms used in the best practices is in Appendix H.

In providing the Best Practices for filing and vetting, we used what we called the “Super PDF” format, which permitted embedding all reference materials into one document via hyperlinking internally; i.e., each best practice is filed as a complete package with all references. Microsoft Word™ format was used to post each best practice on the DT&E Forum website with the references in either Word or PDF format accessible by replying positively to a prompt “View.”

D. Findings and Conclusions

This subtask developed a number of best practices that were mostly aimed at DT&E personnel in acquisition program offices, and some procedures for flight testing of aircraft in the air warfare areas. Additional best practices need to be developed to:

1. Reflect changes to the update to Department of Defense Instruction (DoDI) 5000.02, “Operation of the Defense Acquisition System,” when approved.
2. Outline T&E scope-resource-cost “Evaluation Framework” that provides program managers, Chief Developmental Testers, Lead DT&E Organizations, members of T&E WIPTs, ITTs, and other decision makers with the tools and

worksheets necessary to give insight into the adequacy of a T&E program from a cost, schedule, and performance risk perspective.

3. Promulgate best practice test procedures for other DTAP warfare areas beyond air warfare, which was emphasized in this effort.
4. Further define realistic planning factors for all warfare areas.

The SETP best practices that were in development when the subtask went live for beta testing should also be completed.

In the course of developing these best practices, one area that emerged to be of most interest and need to DASD(DT&E) staff specialists for further and continued development is “planning factors.” The lack of the incorporation of “realistic” planning factors in acquisition and DT&E strategies, and in master schedules and evaluation frameworks is felt to be a major shortfall of TEMPs, and the initial work for the air warfare area performed during this subtask proved to be highly regarded by the test centers interviewed.

3. Development of the DT&E Forum Website

The second part of the task was to develop a website, hosted on a Government server, which would contain relevant DT&E documents along with other information. This website, referred to as the DT&E Forum, is meant to provide two-way communications between the Office of the Deputy Assistant Secretary of Defense for DT&E [ODASD(DT&E)], program offices, and those who conduct DT&E activities in the field. Intended as a worldwide source of DT&E BPLL documents, along with other applicable information (which can be accessed using a CAC) login from any location with Internet connectivity), the DT&E Forum is also intended to provide a means for those engaged in DT&E activities to bring additional BPLL documentation and other applicable information to the attention of ODASD(DT&E).

This chapter describes the evolution of the website from the initial description of the requirements to the publishing of the final version currently hosted on a AT&L eBusiness server.¹ It starts with an overview of the DT&E Forum website as it existed when this report was written. It continues with a discussion of the development of the requirements followed by a review of the steps needed to transform the requirements into a process running on a Government server.

A. Overview of DT&E Forum Website

The DT&E Forum's Home page is shown in Figure 3-1.² Here the user has direct access to all seven of the main functions of the website, including locating BPLL documents, suggesting BPLL documents, and tracking one's input. Each of these functions is briefly described below. Additional detail is provided in the remainder of this chapter and in the User's Guide.³

¹ At the time of this publication, the URL for the DT&E Forum website running on the AT&L server was <https://ebiz.acq.osd.mil/DTE-Forum/>.

² When one first accesses the DT&E Forum, the website displays the Terms of Use page as required by DoD. After reading the Terms of Use, clicking the Continue button at the bottom of the page or the Home button at the top of the page brings up the DT&E Forum's Home page.

³ A User's Guide, a document required by the government organization that hosts the DT&E Forum website, is in Appendix D.



Figure 3-1. DT&E Forum's Home Page

1. Searching for BPLL Documents

The DT&E Forum website contains DT&E Best Practice and Lessons Learned (BPLL) documents along with the sources from which they were derived. A comprehensive search engine is contained in the website to help users locate documents in the database. The graphic at the top center of the home page contains a text window and a Search button, which together can be used to conduct quick searches for documents contained in the DT&E Forum's database. Accessing BPLL documents and the advanced facility are covered in the next section.

2. Suggesting BPLL Documents

Users are encouraged to suggest best practices and lessons learned for inclusion in the DT&E Forum. A form for entering a BPLL document can be obtained by clicking on the Suggest Best Practice (or Submit Lesson Learned) button on the left side of the Home page, as shown in Figure 3-1.

3. Tracking One's Input

The My_Stuff function is a means for users to maintain awareness as to the status of their suggestions and comments. It is accessible through the button labeled My_Stuff at the center of the three buttons just below the Recent Additions graphic. Clicking on it takes the user to a page which lists and permits the user to interact with all inputs the user has made.

4. Announcements

On the left, toward the bottom, is a graphic in which DT&E can place information announcing DT&E activities, such as Blog Events. This graphic also contains a text window and a Submit button, by which the user can suggest new Blog Topics.

5. Blogging

Blogging is one means DT&E plans to use to obtain Forum users' comments on topics of interest. The Blog graphic, on the right side of the Home page, displays the Current Blog Topic and user comments. It also contains a Previous Blog Topic button, which can be used to view archived topics and user comments.

6. Links to Other DT&E Resources

On the right side of the top border is a button labeled Links. Clicking this button takes the user to a page listing URLs of relevant DT&E resources.

7. Contacting DT&E

Also on the right side of the top border is a Contact button, which brings up a window so the user can email DT&E.

B. Accessing BPLL Documents and the Advanced Search Capability

A main objective of the DT&E Forum website is to provide ready access to DT&E BPLL documents. The means for accessing documents stored in the DT&E Forum's database are embodied in the processes described in this section: Quick Search, Advanced Search, and Viewing BPLL Documents.

1. Quick Search

To quickly locate BPLL documents in the DT&E Forum's database, users can enter one or more keywords or phrases⁴ they would logically expect to be associated with the document(s). Users can enter this in the text box containing the words "Find the gouge!" in the center of the Home page and then click on the Search button to the right of the text box.⁵ This will bring up a search results page showing document titles (ordered by best matches) stored in the database and containing the entered keyword(s) or phrase(s) in the document's title, narrative or rationale. An example search results page is shown in Figure 3-2.

⁴ Users should separate multiple words and phrases with spaces and place a single quote (') before and after each phrase (for example, 'Milestone B'). The search function will find keywords as well as words that begin with the keyword. It will only find phrases that exactly match the entered phrase.

⁵ Note: this is a global 'OR' search. That is, it will search for documents that contain any of the keywords/phrases that have been entered. If you need an 'AND' search – one that finds documents containing all of the keywords/phrases that have been entered - use the Advanced Search option as described below.



Figure 3-2. Search Results Page

The Search Results page lists the title of each document found that satisfied the search criteria. Following the best practices, the Results page lists lessons learned documents, blog topics, and links found in the search. Also, under the words Search Results, the keywords(s) and phrases(s) used in the search are given. In the example in Figure 3-2, the keyword was “Test.”

Clicking on the page icon to the left of a document will open the document for the user to read. This is described in the section below titled “Viewing BPLL Documents.”

2. Advanced Search

The website also contains an advanced search facility,⁶ shown in Figure 3-3. At the top, one can select the specific type(s) of material for which to search and the range of dates to be used in the search. In the middle of the page, users can select bins and topics.⁷ Bins contain information that is augmented by material provided when a document is entered into the website. If the list does not contain all the bin topics a user

⁶ The advanced search facility is accessible via the button directly below the text window used to enter words and phrases to be searched for.

⁷ Clicking on a bin (blue bar with white letters) will bring up a dropdown window showing topics associated with that bin.

wishes to use in a search, up to three additional keywords/phrases can be entered at the bottom of the form. Clicking on either Search button will initiate the search.

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DT&E Forum

By testers...For testers

Advanced Search [Search](#)

Sources to Search: ☒ Best Practices ☒ Lessons Learned ☒ Blogs ☐ Links

Dates to Search: ☒ Search All Dates: OR From: To:

Select Standard Bins to Search (Match ☐ Any Bin Selected ☐ All Bins Selected)

Procedures	Requirements & Materiel Solution	Milestone A
<input checked="" type="checkbox"/> Air Platforms (5)	<input type="checkbox"/> JCIDS (2)	<input type="checkbox"/> Entry Online (1)
<input type="checkbox"/> Chemical & Biological Defense (2)	<input type="checkbox"/> Capability-Based Assessment (CBA) (1)	<input checked="" type="checkbox"/> Milestone A I&B* (4)
<input type="checkbox"/> Information Systems (2)	<input type="checkbox"/> Initial Capabilities Document (ICD) (1)	<input type="checkbox"/> Technology Development Strategy (1)
<input type="checkbox"/> Ground Vehicles (2)	<input type="checkbox"/> AoA Guidance (2)	<input type="checkbox"/> Competitive Prototyping (2)
<input type="checkbox"/> Sea Vehicles (2)	<input type="checkbox"/> Capstone Threat Assessment (1)	<input type="checkbox"/> Contractor I&B Capability Invt. CBA (1)
<input type="checkbox"/> Weapons (4)	<input type="checkbox"/> Critical Technology Elements (2)	<input type="checkbox"/> Use of Gov. I&B Capability/Facilities/Ranges (2)
<input type="checkbox"/> Space Platforms (2)	<input type="checkbox"/> AoA Development (2)	<input type="checkbox"/> Gov. I&B Capability Invt. (1)
<input type="checkbox"/> Ballistic Missiles (2)	<input type="checkbox"/> Evaluation Plan (2)	<input type="checkbox"/> Technology Readiness Assessment (TRA) (2)
<input type="checkbox"/> Biomedical (2)	<input type="checkbox"/> Embedded instrumentation (2)	<input type="checkbox"/> OGA's Independent Cost Estimate (1)
<input type="checkbox"/> Sensors, Electronics, and Electronic Warfare (2)	<input type="checkbox"/> HPI* and CDRL D1&B Requirements (2)	<input type="checkbox"/> System Engineering Plan (SEP) (2)
<input type="checkbox"/> Human Systems (2)	<input type="checkbox"/> Government I&B Infrastructure Capa (1)	<input type="checkbox"/> AoA Report (1)
<input type="checkbox"/> Nuclear Technology (2)	<input type="checkbox"/> Modeling and Simulation (1)	<input type="checkbox"/> HAM-C National Report (2)
<input type="checkbox"/> Battlespace Environments (2)	<input type="checkbox"/> HIO Designation (1)	<input type="checkbox"/> FYBS (1)
<input type="checkbox"/> Materials & Processes (2)	<input checked="" type="checkbox"/> Acquisition Strategy (2)	<input type="checkbox"/> Milestone A (18)
	<input type="checkbox"/> Urgent Needs (2)	
	<input type="checkbox"/> Requirements & Materiel Solution (7)	

EMD Milestone C Technology Development Milestone B Production & Development

Operations & Support Other

AND

Enter up to 3 keywords or phrases below (Match ☐ Any Keyword/phrase below ☐ All Keywords/phrases below)

[Search](#)

About Disclaimer Terms of Use Privacy Admin

Figure 3-3. Advanced Search Facility

Search results will be displayed in the same type of webpage as shown in Figure 3-2 with the following augmentations. The “Results for:” line shows the words searched for with “WITH” separating keywords/phrases from bin topics.^{8,9} Furthermore, both the bin and keyword parts of the search can be directed to operate differently in that they both have their own AND and OR controls.

⁸ The ‘WITH’ separator should be read as an AND operation because the search engine will only locate information that meets both the bin/topic criteria and the keyword criteria.

⁹ When the line leads off with ALL, it means that no keywords or phrases were entered in the text boxes at the bottom of the form.

3. Viewing BPLL Documents

Once a document has been located, as in Figure 3-2, clicking on the page icon to the left of the document or on the document's title will open that document for the user to read. An example is shown in Figure 3-4. Note, when found, the keyword(s) or phrases(s) used in the search are highlighted in the document. "Test" was used as the search criteria in the example shown in the figure.

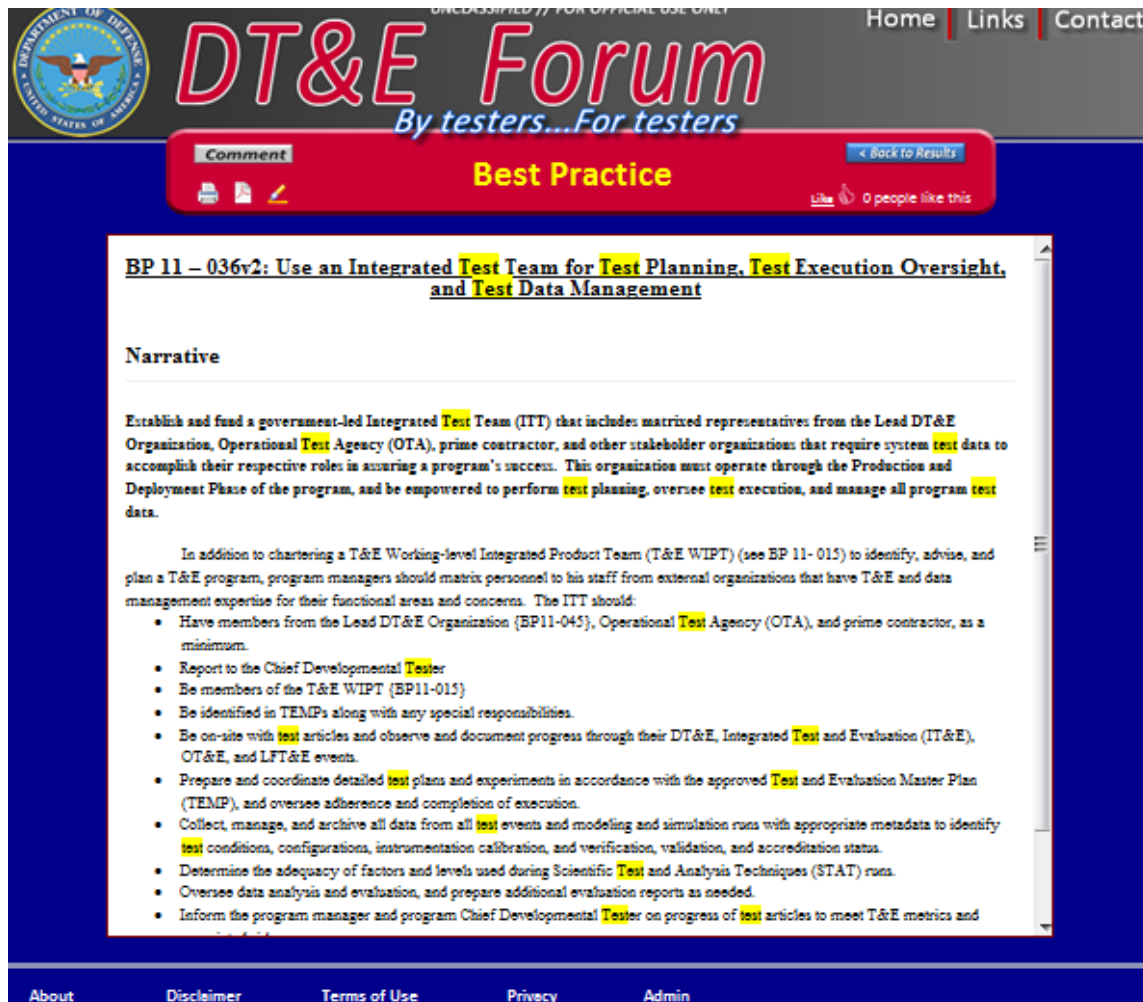


Figure 3-4. Viewing a Document Online

Hyperlinks to documents or other material may appear. These hyperlinks are shown in blue underlined text in the Links to Source column of the References section of the document. Clicking on a hyperlink to a reference document will open that document on the screen, in a separate window, for the user to view.

The top border of the document page contains six buttons to enable the user to carry out or request one of the following actions: Provide feedback (Comment button), Print, Download, Highlight Off, Like, and Return to Results. Highlight Off turns off the highlighting of keywords/phrases found in the search. The Like button is available for

the user to indicate that he or she likes the document and increases the document's Like counter by one. The Return to Results button returns the user to the Search Results page.

Clicking on the Comment button brings up a window that allows users to enter comments. If users do not want their names associated with the comment(s), they can put a check mark next to "Mark if not for Attribution." When done, the Submit button sends the comment(s) to DASD(DT&E). With the MyStuff button, described above, a user can follow actions taken by DT&E based on his or her input.

C. Evolution of the Website's Requirements

When the task began in May of 2011 no definitive requirements were available with which to begin to build the DT&E Forum website. A number of meetings were held, ideas were presented from both sides, and Power Point versions of websites were provided. The home pages for some of these versions are provided in Figure 3-5, 3-6, and 3-7. However, it was not until DASD(DT&E) provided its 19 September 2011 version¹⁰ that sufficient detail and stability were available such that real work on the DT&E Forum website could begin.

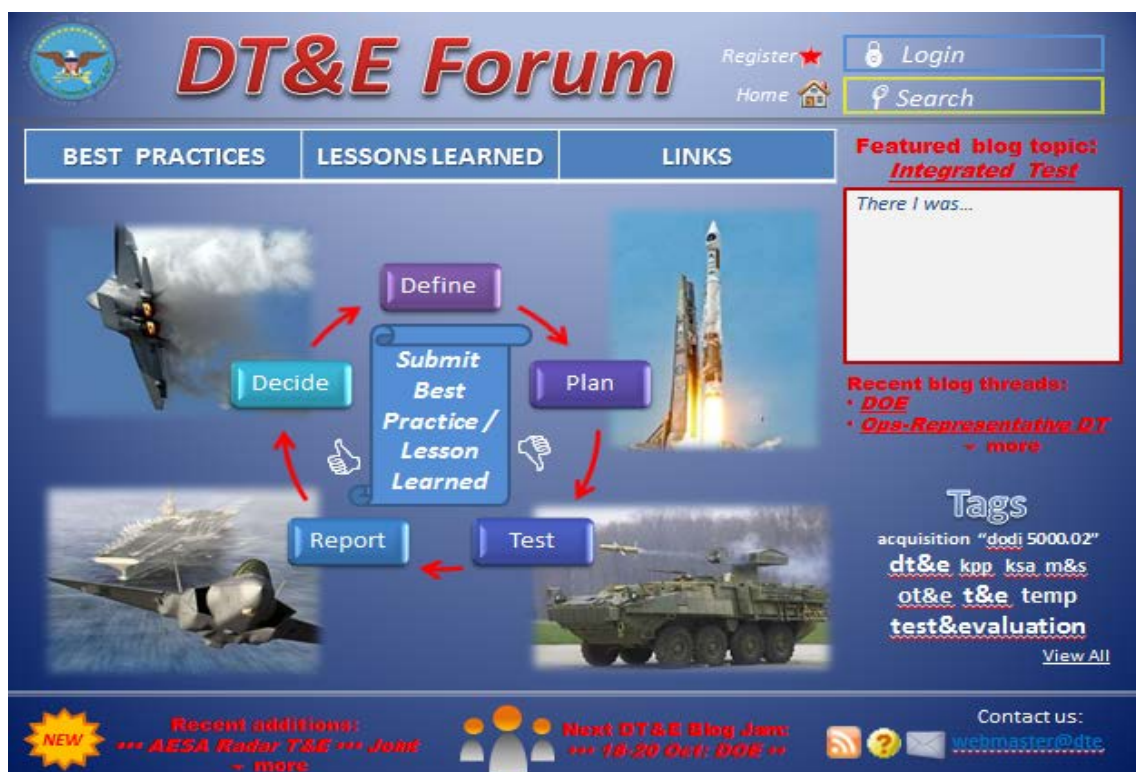


Figure 3-5. 4 May 2011

¹⁰ The complete set of slides for this version is provided in Appendix D.

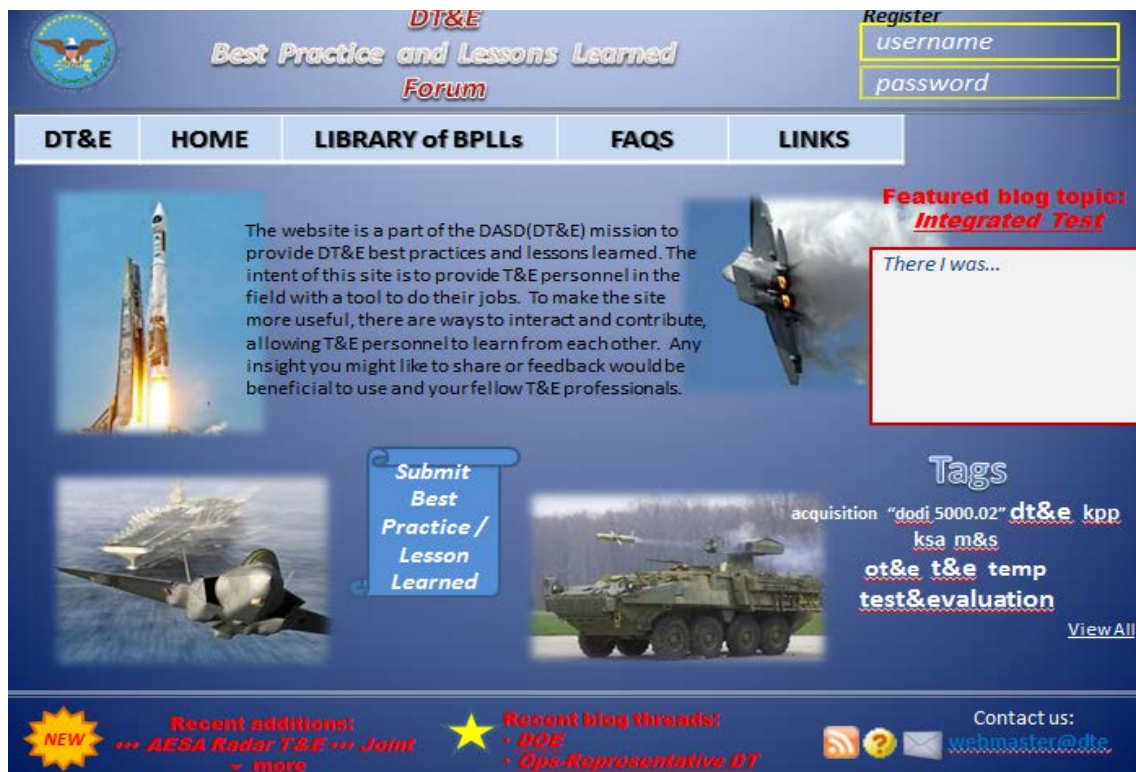


Figure 3-6. 21 July 2011



Figure 3-7. 17 August 2011

Even though the slides in the 9/19/11 PowerPoint presentation bear little resemblance to the webpages in the final Forum website, which can be seen, in part, by comparing the home pages in Figure 3-8 and Figure 3-1, it did, along with the accompanying discussion, begin to make clear DT&E's main objectives of the website which include providing:

- Controlled access to all aspects of the website using the CAC as the control element
- Storage for relevant DT&E best practices and lessons learned documents, including those developed in the first part of this task
- A comprehensive means of searching for and displaying documents having topics of interest
- A means for users to comment on best practices and lessons learned contained in the database
- A means of downloading a copy of a selected best practice or lesson learned
- A means for users to suggest additional best practice and lessons learned documents
- A means for users to comment, directly to DT&E, on other aspects of the website
- A means for DT&E to obtain user reaction to specific topics via blogs
- A means for DT&E to announce events to the users
- Links to DT&E relevant resources.



Figure 3-8. 19 September 2011

Although the above is certainly an impressive list, some fundamental functions are still missing, including a means for users to maintain awareness as to the status of their suggestions and comments and the entire set of administrative functions. These were added by the programming team. Additions include the following:

- User access to DT&E's processing of user's inputs including:
 - Comments on BPLLs contained in the DT&E Forum
 - Suggested additional BPLL documents
 - Site feedback
 - Links to websites
 - Blog topics
- Facilities for Administrators to:
 - Manage users
 - Draft new BPLL documents
 - Review and edit active as well as draft BPLL documents
 - Manage application settings
 - View and manage user submissions
 - View and manage blog topics and comments
 - Manage DT&E Forum website links page
 - Manage document categories and subcategories.

D. Timeline for the Development of the DT&E Forum Website

About the time DT&E provided the 9/19/11 guidance noted above, they asked IDA to provide a Plan of Action and Milestones (POA&M) for carrying out and completing the effort. IDA provided the chart shown in Figure 3-9. The 3 months allotted for user testing was insufficient in DT&E's mind and they directed IDA to revise the POA&M to provide 7 months of user testing. The revised chart, delivered to DT&E on 11 October 2011, is shown in Figure 3-10. Subsequently, the target date DT&E selected for IDA to deliver the user evaluation version of the website to AT&L was 19 January 2012. However, as that date approached, DT&E decided to continue to modify the website and canceled delivery to AT&L. The resultant schedule is shown in Figure 3-11. As this figure shows, the user evaluation version was delivered to AT&L on 24 May 2012. User testing was done during the period 22 June 2012 to 1 September 2012. The final version of the DT&E Forum website code was delivered to AT&L about 5 September 2012 and AT&L brought the system operational on one of their servers on 27 September 2012.

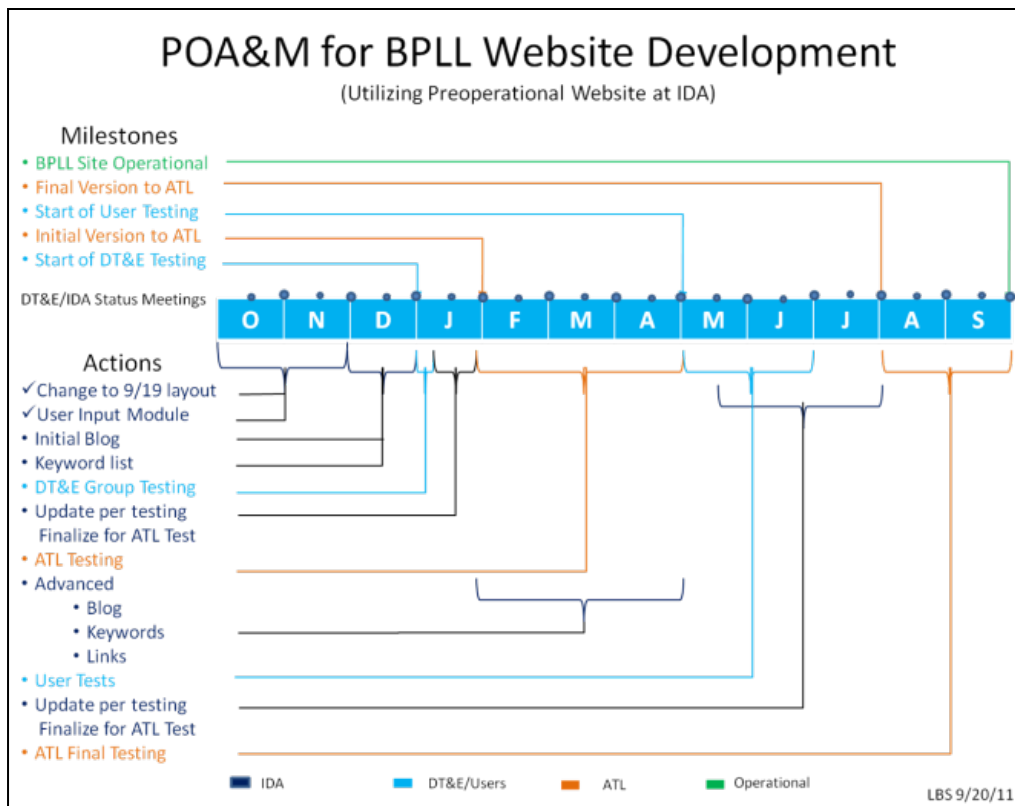


Figure 3-9. POA&M for BPLL Website Development

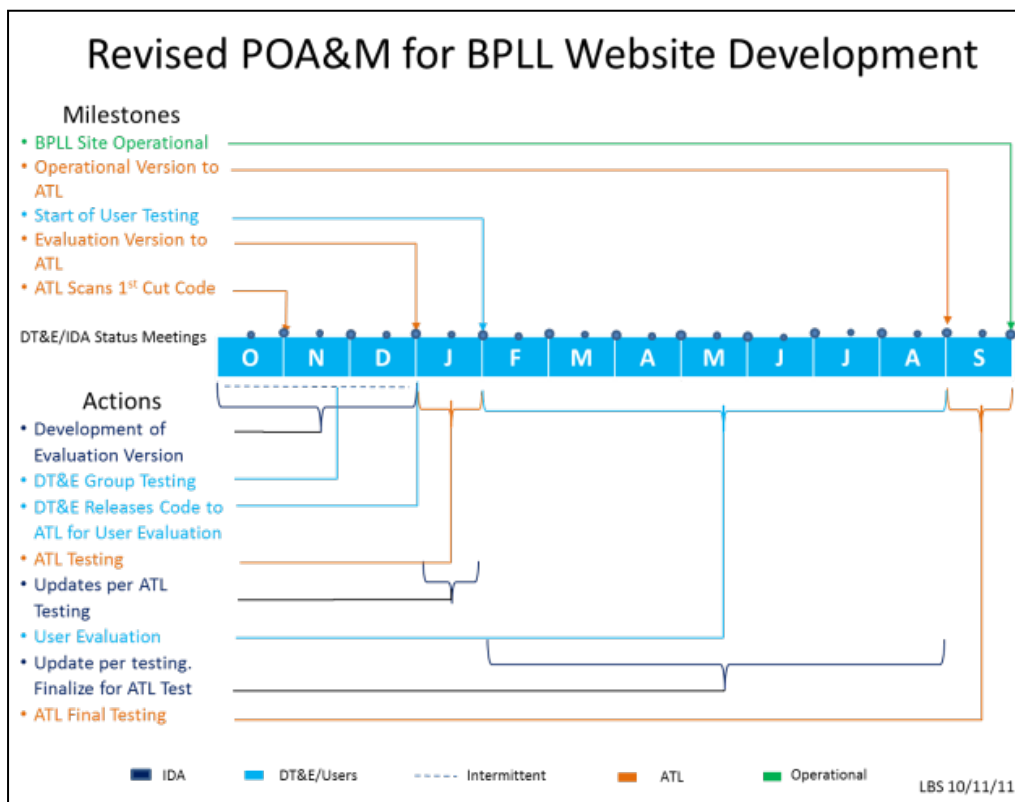
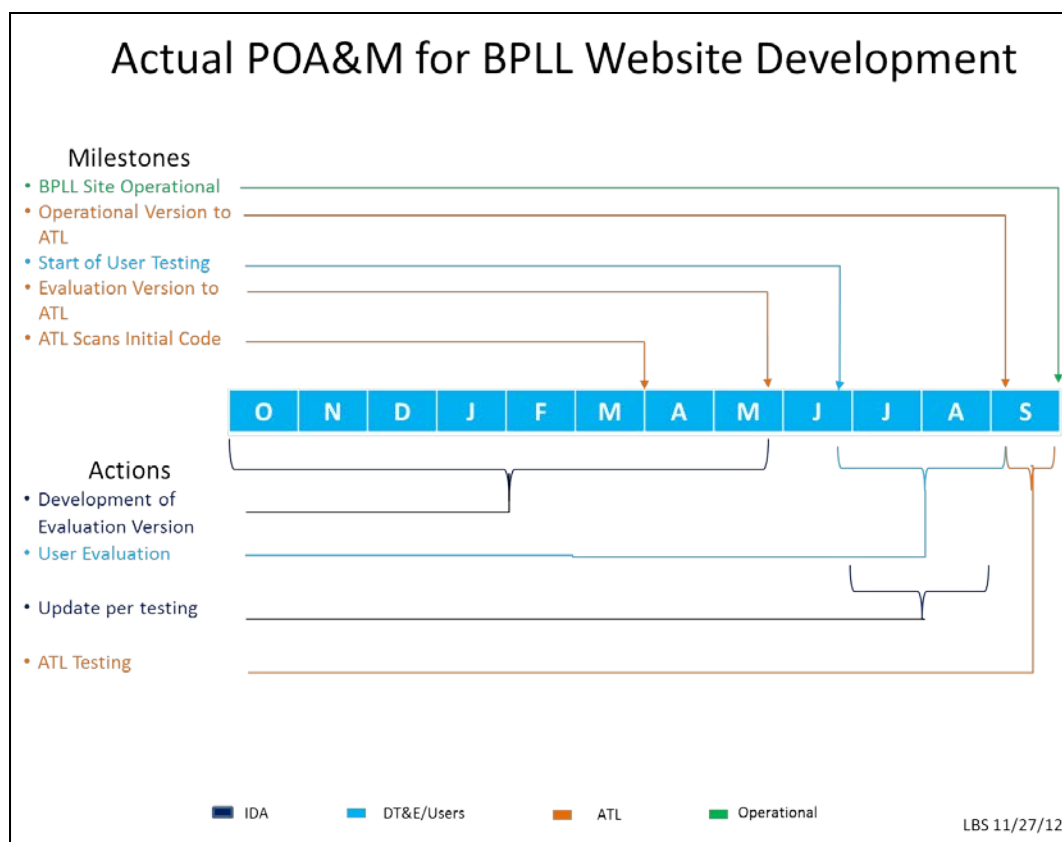


Figure 3-10. Revised POA&M for BPLL Website Development



E. A Host for the DT&E Forum Website

According to the task order, IDA was to deliver the prototype code and “aid DASD(DT&E) in transforming the prototype to enable it to be hosted on the DT&E website.” However, that turned out to be impossible for two reasons. First, the DT&E website is a public website and, as such, cannot contain For Official Use Only information, which at least some of the BPLL documents include. Second, the DT&E website’s pages are static. They cannot have associated databases that are required to store the BPLL documents in the DT&E Forum’s website.

Once the ODASD(DT&E) discovered that they could not have the DT&E Forum website hosted on their public website, they requested help from AT&L. A meeting to explore AT&L's requirements for hosting a website such as the DT&E Forum was held on 13 September 2011. Questions led to a second meeting on 5 October 2011. As a result of these meetings, it was decided that the effort would move forward with AT&L hosting the website on one of its servers. AT&L's eBusiness Center provided the go forward plan as an organized set of steps (shown in Appendix E). Included in the steps are a set of documents AT&L required of DT&E as part of the conditions for AT&L to host the DT&E Forum website. These include but are not limited to:

1. Business Needs Analyses (BNA)
2. Memorandum of Agreement (MOA)
3. Request For Change (RFC)
4. Application Operational Requirements Questionnaire
5. DoD IT Portfolio Repository (DITPR)
6. Privacy Impact Assessment Form (DD Form 2930).

Given DASD(DT&E)'s shortage of website personnel at the time, IDA was asked to fill out the forms and send them to DASD(DT&E) for review, signature, and subsequent transmittal to AT&L. The completed forms as transmitted to AT&L are provided in Appendix F.

F. Working With AT&L

Some of the steps in AT&L's timeline for deploying the DT&E Forum website (as shown in Appendix E) required a code-level interface between IDA, ODASD(DT&E), and AT&L. These steps are discussed below.

- Step 10 – IDA delivered all code and database and installation/configuration instructions to AT&L engineers. This and the next two steps were done in stages, starting rather early in the code-development process and repeated several times as the code matured. This allowed the IDA and AT&L teams to become acquainted and understand the testing that they needed to do.
- Step 11 – AT&L ran Fortify (code vulnerability) scans on the source code and sent the results to DT&E/IDA for review, justification, or remediation.
- Step 12 – IDA modified the application code to remediate each vulnerability or provided a justification as to why a vulnerability did not need remediation. IDA provided justifications (in the form of an Excel spreadsheet) and remediated code to AT&L for their review.
- Step 14 – If no code changes were required as a result of vulnerability remediation, when documentation was approved by AT&L IA (Information Assurance), AT&L installed the approved application code and databases into the ATL MAE STAGING environment. If changes were required to application, IDA provided updated code for another Fortify scan as described in steps 11 and 12.
- Step 15 – Enterprise IT Services Directorate (EITSD) conducted a scan of STAGING servers with the application code loaded.
- Step 16 – Installations and Environment (I&E) conducted DT&E User Acceptance Testing in the STAGING environment.

- Step 17 – The User Acceptance Testing (UAT) Form was signed by DASD(DT&E) and returned to AT&L.
- After AT&L acceptance of UAT form, the code was scheduled to be moved to the Production environment during an after-hours period where DT&E and IDA could immediately perform UAT again. If UAT was successful, the code remained on the production server. If UAT failed, the code was removed from the production server and the process of recoding and testing would be restarted.

4. Potential for the DT&E Forum to Be the Model for DASD(DT&E)'s Internal Website

As the task was nearing completion, the IDA team was made aware that a number of other IDA tasks were developing information requested by DASD(DT&E) . The form of the information ranged from groups of documents, to charts, to source documents, to a software program. An observation was made that at least some of this material would be of interest to a rather wide DT&E audience and there did not appear to be an adequate means of providing the material to such an audience. This prompted several questions: “To what degree can the DT&E Forum website be expanded to provide the needed distribution?” “To what degree can the DT&E Forum website restrict portions of information and functions to outside users to meet the needs for a DASD(DT&E) Internal website?” and “What effort is required to make any needed changes?” A different way of looking at the questions is to observe that the current DT&E Forum website provides wide-area access to an application used by a group of people and then to ask about the effort required to modify the website to provide many applications to many groups of people. This chapter represents an initial attempt to answer these questions.

A. Utility of a DASD(DT&E) Internal Website

We first looked at what use DASD(DT&E) might make of an internal website. Some of the uses are shown in the following list. Although all of these functions can be done without an internal website, the use of a website provides a greater span of the enterprise for both dissemination and acquisition of information.

- Planning of activities
- Coordination of activities
- Reporting on activities
- Communications among elements
- Collection of information
- Dissemination of information.

Next we asked what basic functions would be necessary in an internal website and how does this compare with those in the DT&E Forum website? Given the team's lack of information on the internal website, it was not possible to provide a comprehensive answer to the first part of the question. However one can look at the basic functions contained in the DT&E Forum and envision how they might change in an internal DASD(DT&E) website. This is shown in Tables 4-1 and 4-2 for the user interface (UI) and administrative functions, respectively. As can be seen from these tables, the basic functions in the DT&E Forum would still apply, but they would be broadened. For example, from “BPLL documents” to simply “documents.”

Table 4-1. UI in DT&E Forum, UI for Internal Website

<ol style="list-style-type: none"> 1. Simple & complex searches for BPLL documents 2. Ability to read and download BPLL documents 3. Capability to suggest BPs and LL documentation 4. Blogs for users to comment on 5. URLs for DT&E related websites 6. Direct DT&E contact capability 7. Means to view DT&E actions on suggestions 	<ol style="list-style-type: none"> 1. Simple & complex searches for documents 2. Ability to read and download documents 3. Capability to suggest new documentation 4. Blogs for users to comment on 5. URLs for DT&E related websites 6. Direct DT&E contact capability 7. Means to view DT&E actions on suggestions
--	---

Table 4-2. Admin in DT&E Forum, Admin for Internal Website

<ol style="list-style-type: none"> 1. Manage Users 2. Draft New Best Practices & Lessons Learned 3. Review & Edit Existing BPLL Documents 4. Manage Application Settings 5. Manage User Submission Queue 6. Manage Blog Topics and Comments 7. Manage Links Page 8. Manage Document Categories & Subcategories 	<ol style="list-style-type: none"> 1. Manage Users 2. Draft New Documents 3. Review & Edit Existing Documents 4. Manage Application Settings 5. Manage User Submission Queue 6. Manage Blog Topics and Comments 7. Manage Links Page 8. Manage Document Categories & Subcategories
--	--

B. Ongoing DASD(DT&E) Tasks at IDA

A quick review of ongoing DASD(DT&E) tasks at IDA identified eight areas of tasking in addition to the development of the BPLL Documents and Website task. They are shown in Table 4-3. All, or nearly all, are providing information that could be put on a website. Some, such as Air Warfare, are providing hundreds of pages of data. Others, such as the Knowledgebase and Vehicle Reliability tasks, are developing material meant for wide distribution. In the following, we describe how selected portions of this material might be made available on a website.

Table 4-3. Example of IDA Tasks Creating Documentation for DASD(DT&E)

DT&E Tasking Area	Examples of Tasking
Air Warfare	Planning Factors – Estimating Test Requirements from Historical Data
Land Warfare	Analyses of the Reliability and Effectiveness of EO/IR Sensors on Unmanned Aerial Vehicles
Naval Warfare	Analyses of Aviation Operations for CVN 78
Space and BMD Systems	Analyses Framework for Mobile User Objective System
Cyber and Information Systems (Mobile App Testing)	Commercial Practices for Test and Evaluation of Mobile Applications
Special Projects ^a	
Cyber Defense	DT&E of Cyber Defense Capabilities
Knowledgebase	Development of DT&E Knowledgebase
Vehicle Reliability	Reliability Quick Reference Guide and Computer Program for DT&E

^a These tasks were done for the Principal Deputy, DT&E.

C. Potential Forum Website Transformation

To show how easily the DT&E Forum website could be modified to become the DASD(DT&E) internal website,¹ we took five simple steps. First, the original Forum website was separated into its two components: the generic website administration component and the BPLL application. Second, a new home page was attached to the generic website administration component. As shown in Figure 4-1, this home page has hot buttons for a number of applications including those associated with land warfare, air warfare, etc.² Third, the BPLL application was attached to the hot button marked BPLL Documents so that, when the button on the application is clicked, it executes as it did in the original Forum. Fourth, we designed initial applications to display data from a number of the ongoing tasks. Where time and resources permitted, these were added to the proposed internal website. Finally, the proposed internal website was placed on IDA's developmental server so that DASD(DT&E) personnel could access and test it.³ The material available on the IDA server at the time this document was written is described in the following sections. The buttons on the home page (Figure 4-1) with applications associated with them are underlined with a solid line. Where the design is described in the following sections but the application was not incorporated into the website, the underlining is dashed.



Figure 4-1. Example of an Integrated DASD(DT&E) Forum Home Page

¹ In the following, the proposed DT&E internal website is referred to simply as the proposed internal website.

² It should be specifically noted that the layout of this home page is for demonstration purposes only.

³ At the time of this publication the URL for the proposed internal website was <https://www6.idss.ida.org/DTEforum2/Ihome.aspx>

1. Air Warfare

The home page for the Air Warfare application is shown in Figure 4-2. The Air Warfare task provided information on planning factors. These can be seen by clicking on the Air Warfare button on the proposed internal website's home page, which will bring up the Air Warfare's home page. Entering any keyword or phrase contained in the template into the "Find the gouge!" text box and clicking on the Search button will bring up a template like the one shown in Table 4-4.

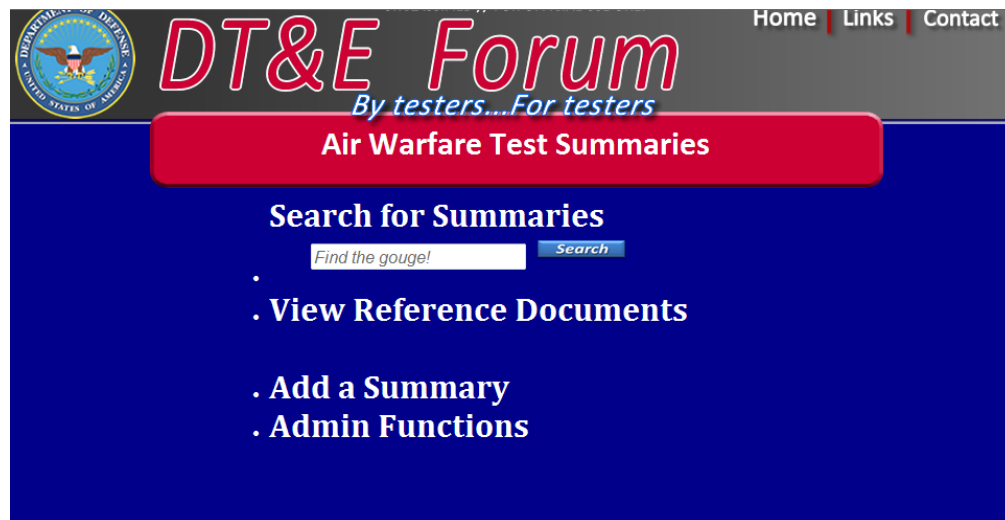


Figure 4-2. Home Page for the Air Warfare Test Summaries

Table 4-4. Example of a Planning Factor Template

Heading	Content/ Notional Examples
Group	Large Aircraft, Air Weapons, Helicopter or Ground Vehicle
System Tested	System Name
Phase of Sys Development	e.g., DT prior to Milestone C
Type of Test	e.g., Flight Test
What is Tested? (expanded)	Expanded description- e.g., Functions covered in a flight test
Purpose of Test	e.g., Explore key design drivers; Evaluate program KPP/ KSA; Test Program Reqts; Run & Observe; Certification
Venue for Test	e.g., Edwards Flight Test Center
Test Planning Parameters	Factors and dimensions /Values for this test (e.g., days/14 days)
Number of Test Platforms	e.g., Three aircraft
Dates of Testing	e.g., May-June 2010
Factors Affecting Test	e.g., Range instrumentation problems delayed testing for 1 week.
Did test Meet Objectives?	Short summary (test quality/ system performance, as relevant)
Testing Organization	e.g., 437 th Airlift Wing
Reference Test Documents	e.g., XX DT Report, Corp Author, Date, Classification, Pages

2. Mobile App Testing

Another area that might profit from broad availability of information is the development of plans for testing of mobile apps. Figures 4-3–4-6 show examples of some webpages that could be used to help automate the development and distribution of mobile app test plans. The first webpage, shown in Figure 4-3, provides the capability for the user to create a new checklist and to view or modify existing checklists. If the user has the appropriate permissions and clicks on the Create New Checklist button, the system will bring up a series of webpages, the first of which is shown in Figure 4-4. These pages, developed using material from the Commercial Practices for Test and Evaluation of Mobile Applications task, contain a comprehensive list of issues related to the testing of mobile apps. Not all issues relate to every app. The issues that need to be included in any particular test are determined by the app's specification as well as how far along the app is in its developmental process. The check list shown in Figure 4-4 contains check boxes to specify that a particular issue is required (R) to be included in the upcoming test, it is desired that it be included with a range of 5 to 1, or is not required (N) to be included.

App Test Planning Checklist

- Create New Checklist
- View/Modify Existing Checklist in:
 - Air warfare
 - Land Warfare
 - Naval Warfare
 - Space & BMD
 - Information Systems
- Help

Figure 4-3. App Test Planning Checklist

Creating New Checklist

Issues	Include in Upcoming Test
APP DOCUMENTATION	
1 Is documentation sufficient to understand intent, function and flow of App such that an adequate test plan, which will answer the applicable questions in this document, can be created?	R 5 4 3 2 1 N <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
LOAD, INSTALL, LAUNCH AND UNINSTALL	
1 Can App be adequately loaded and installed OTA and via USB port?	R 5 4 3 2 1 N <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
2 Is length of launch/start time within specified timeframe?	R 5 4 3 2 1 N <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
3 Can installation of App be interrupted and then App re-installed?	R 5 4 3 2 1 N <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
4 Can App be uninstalled?	R 5 4 3 2 1 N <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
5 Is App deactivatable and then reactivatable?	R 5 4 3 2 1 N <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
6 Does App execute without requiring OS restart?	R 5 4 3 2 1 N <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
7 Is App updatable OTA and via USB port?	R 5 4 3 2 1 N <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
8 Has App been adequately tested on actual target devices?	R 5 4 3 2 1 N <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
9 Does App run on all applicable models?	R 5 4 3 2 1 N <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
LOCALIZATION	
1 Does App correctly handle time zone changes?	R 5 4 3 2 1 N <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
2 Does App permit selection of target language?	R 5 4 3 2 1 N <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

Save
Cancel

Figure 4-4. Creating New Checklist

At any point, the user can save or discard (cancel) the new checklist. If the Save button is clicked on, the system will bring up the page shown in Figure 4-5. This webpage is used to record information about the checklist as well as define where it is to be stored. Once the organization the app belongs to is identified,⁴ a list of folders available for storing their apps will be shown. The user can select a folder from that list or define a new one. The new one is automatically associated with the selected organization.

⁴ Only organizations for which the user has permission to create checklists will be selectable.

Save New Checklist

Test Planner's Name: Auto Filled In

Date: Auto Filled In

App to be Tested: _____

Version: _____

Origination Conduction Test: _____

Date(s) of Testing: _____

Select Division

Select Folder


Save
Cancel

Figure 4-5. Save New Checklist


If a user enters the system to view or modify a checklist, he or she will see a webpage like that shown in Figure 4-3. However, only those areas for which he or she has view or modify privileges will be selectable. Selecting an available area will bring up the webpage similar to that shown in Figure 4-6 for the area selected. Clicking on the appropriate button will cause the system to bring up the checklist for that test,⁵ which the user can modify, given he or she has the required permissions.

View/Modify Existing Checklists In


Air Warfare



App 1



App 2



App 3

Figure 4-6. View/Modify Existing Checklist in Air Warfare

3. Space and Ballistic Missile Defense (BMD)

The Mobile User Objective System (MUOS) task provides DASD(DT&E) with a number of charts as part of an analyses framework for that system. Figure 4-7 shows the

⁵ What is called a test here may actually be a hierarchy of tests or test plans and could also include test results.

home page which provides access to this information. The home page is accessible via the Space & BMD button on the proposed internal website's home page.

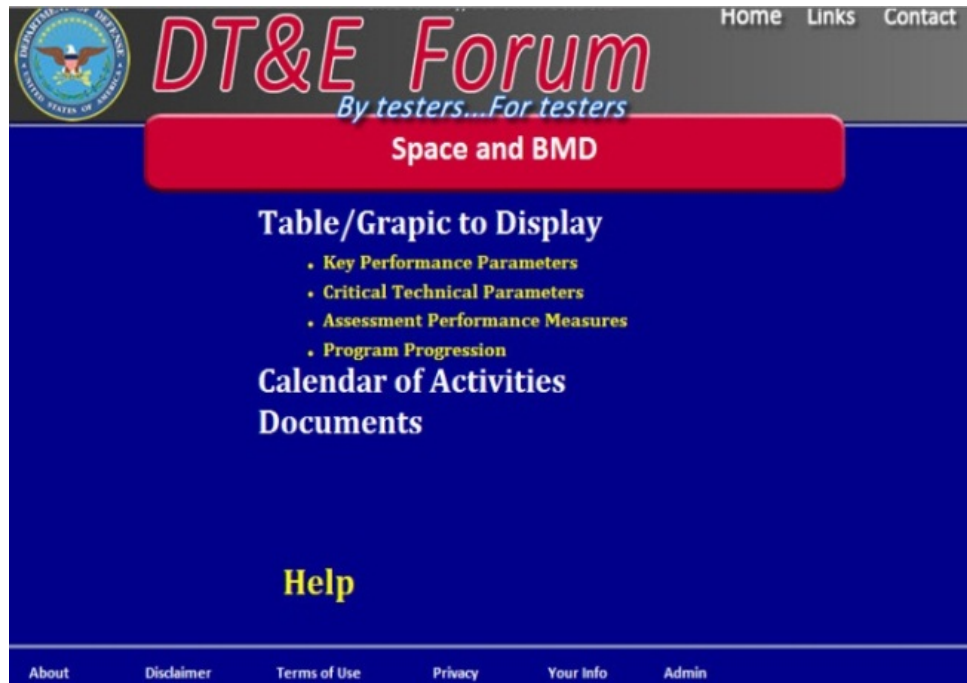


Figure 4-7. BMD Home Page

Four of the charts have been placed on the developmental server corresponding to the four buttons shown on the apps home page: Key Performance Parameters; Critical Technical Parameters; Assessment Performance Measures; and Program Progression. Clicking on the Help button will bring up a chart, which provides information on the meaning of the colors and words used in the charts.

4. Knowledgebase

The knowledgebase effort collects documents and other information of interest to DT&E and places those documents and information on a DVD. The DVD also contains a search program that permits a user to search the contents of the DVD for information currently of interest to the user. Since the DT&E Forum was designed as a document repository and has a comprehensive search program, it should be able to handle the knowledgebase task with minor changes – mostly deletions.

5. Vehicle Reliability

The Vehicle Reliability effort has two types of material to place on the proposed internal website: the Reliability Quick Reference Guide and the software program that the task order calls for which is currently in development.

6. Library

The website, in addition to providing a library for each app or group of apps, can also provide a ODASD(DT&E) library. When a document is entered into an app's library, a checkbox can be provided. The function of the checkbox would be to permit the user, as he or she is entering the document, to indicate that the document is to be made available to all of ODASD(DT&E) or only to the project team. Documents that are made available to all of DT&E could be found by clicking on the Library button on the internal website's home page. This would bring up the document search app described above, but with access to all of the documents and other material released to all of DT&E.

7. Other

In addition to the above, the internal website could be used to keep users informed and obtain needed data from the community.

As described in the previous chapter, the DT&E Forum website was developed with the idea in mind that it could be used to keep the users informed – a place where users could go to find the latest information. In addition, the DT&E Forum was designed to allow users to provide several different types of information including lessons that had just been learned and feedback on ways to improve the website. These two facilities could be provided in the proposed internal website as well.

The DT&E Forum website uses a CAC login process to control access to the information it contains. Data on the card is also used to identify users who have been granted administrative privileges. This same process could be used to control which users are allowed access to which of the applications. Additional security techniques can be incorporated as necessary.

D. Summary and Conclusions

Analysis of the material presented in this chapter leads to the following conclusions:

- The DT&E Forum website developed as part of this task:
 - Can be viewed as a website with one application
 - Can be easily modified to support many applications
 - Can support many simultaneous users using different applications
 - Contains features useful to many applications such as:
 - Both simple and complex search mechanisms for finding documents, charts, etc.
 - Both search mechanisms support searches involving multiple keywords and multiple key phrases as well as combinations of both
 - A comprehensive database storage facility
 - A feature to fully index documents to support the searches

- Tasks at IDA are developing a significant amount of information that may be of interest to a wide range of people working in DT&E.
- Much of the information IDA is developing as part of the DT&E tasking could be made available to those working in DT&E via a modified version of the DT&E Forum website (the proposed internal website) developed as part of this task. Material developed or acquired by the ODASD(DT&E) could be distributed in this manner as well.

Appendix A

An Example of a Best Practice

This appendix provides an example of the best practice documents developed in this task. The general outline for a best practice is shown in Figure 2-3.

BP 11 – 015: Establish a Test and Evaluation Working-Level Integrated Product Team (T&E WIPT)

A. Best Practice

Charter a T&E WIPT to advise and develop the T&E program for TEMPs and acquisition strategies, cost and schedule planning for tradeoff analyses, insertions into programmatic and contractual documents, oversee progress in testing execution, oversee data management and configuration tracking, inform progress and assessment reviews, and advise on T&E program issues.

As early in an acquisition program, preferably at the onset of a materiel solution decision, the program office should charter a T&E WIPT, to be led by the Chief Developmental Tester in the program office, and with, as a minimum, the following representative membership:

- The designated Government Lead DT&E Organization (external to and independent of the program office)
- The designated Operational Test Agency (OTA)
- Oversight organizations (OSD or Service/Defense Agency Headquarters depending on whether the program is on the OSD T&E Oversight List)
- Members of the Integrated Test Team (ITT)
- Organizations that issue certifications and accreditations based on test data
- All evaluating and reporting organizations for the program
- Organizations that generate data for the program
- Organizations that require T&E data for the program
- Other supporting or participating test organizations (PTOs) when appropriate
- Logistics and training organizations when appropriate
- The system contractor when selected.

The basic roles and responsibilities for a T&E WIPT should be as follows:

- Assistance and advice in T&E strategy development and T&E program planning and for cost and schedule development (See BP 11-008). In particular:

- Analysis of Alternatives (AoA) to ensure cost of T&E is considered and assumptions are realistic
 - Acquisition Strategy, Technology Development Strategy, and the Life-Cycle Sustainment Plan (LCSP)
 - Contract preparation, solicitation, review, and awarding [Request for Proposal (RFP), Statement of Work (SOW), Contract Data Requirements List (CDRL)]
 - Evaluation plan
 - TEMPs and TEMP updates for all acquisition milestones
- Plans of action for all acquisition milestones, certifications, interoperability and information assurance, user involvement, Government and contractor participation, and other major events.
 - Proposals of tailored documentation and milestone requirements.
 - Review and provision of early input to strategic and contractual documents.
 - Coordination of T&E WIPT activities with the ITT and Overarching Integrated Product Team (OIPT) members.
 - Deliberate the resolution of issues in a timely manner.
 - Assumption of responsibility to obtain principals' concurrence on issues, as well as with applicable documents or portions of documents.

The T&E WIPT members should meet quarterly as needed to understand and build program strategies, to resolve issues, and to produce or influence specified products or actions. The T&E WIPT should operate in accordance with best practices to be followed by any Integrated Product Team (IPT) as shown in Table A-1.

Table A-1. Integrated Product Teams Best Practices Checklist

Open Discussions with No Secrets	
Do	Don't
<input checked="" type="checkbox"/> Engage all members in the IPT process by soliciting inputs and applying active listening skills.	<input type="checkbox"/> Personalize organizational position.
<input checked="" type="checkbox"/> Know your team members' preferred methods of communication, and thoroughly understand their organizational roles and operating environments.	Isolate people. IPTs are only effective when all team members are participating.
<input checked="" type="checkbox"/> Trust and accept each person's expertise and advice.	Leave issues unaddressed. Unaddressed issues tend to resurface at higher levels and often drive major rework.
<input checked="" type="checkbox"/> State the extent of your authority/empowerment and immediately identify issues which are beyond established limits.	Forget to document actions/decisions. Documentation provides all team members an opportunity to clarify issues and a historical record of decisions.
<input checked="" type="checkbox"/> Establish and stick to the agenda for the meeting. Establish operating procedures which allow any team member to redirect side issues to other forums.	
<input checked="" type="checkbox"/> Take the necessary time to prepare for the meeting in advance. Conduct research, and pre-meeting coordination necessary to optimize the time used in a group session.	
<input checked="" type="checkbox"/> State your organization's agenda and position. Openly discuss, resolve, and when required elevate issues.	
Dedicated/Committed Proactive Participation	
Do	Don't
<input checked="" type="checkbox"/> Commit yourself to the objectives of the IPT.	Bring a personal agenda/negative attitude to the IPT.
<input checked="" type="checkbox"/> Represent your functional area without bias.	Bring additional support staff
<input checked="" type="checkbox"/> Actively seek and receive input of others.	Skip meetings
<input checked="" type="checkbox"/> Come prepared.	
Issues Raised and Resolved Early	
Do	Don't
<input checked="" type="checkbox"/> Ensure that a structure is in place to identify issues (e.g., dedicate a portion of each meeting to raising/discussing issues).	<input type="checkbox"/> Raise issues outside the IPT process (i.e., no end runs).
<input checked="" type="checkbox"/> Attempt to resolve issues within the IPT. When issues cannot be resolved, provide a complete description of the pros and cons of unresolved issues to decision makers.	
<input checked="" type="checkbox"/> Quickly elevate unresolved issues that are impeding program progress.	
<input checked="" type="checkbox"/> Ensure necessary functional responsibilities are represented.	

Charter Launch Initiation			
Charter		Launch	
☑ Obtain senior management agreement on charter objectives.	⊖ Proceed without a written charter or establishing resources.	☑ Launch the IPT as soon as possible following charter sign-off.	⊖ Allow the launch to be cumbersome and unfocused.
☑ Ensure adequate resources are available (money, time, and people).	⊖ Make the charter too complicated.	☑ Ensure IPT agreement and understanding of the charter	⊖ Discourage open member participation.
☑ Ensure charter goals, objectives, and schedules are realistic.		☑ Ensure IPT members are trained prior to launch.	
Issues Raised and Resolved Early			
Do		Don't	
☑ Develop approaches to provide feedback to team members and their home organizations.		⊖ Ignore subpar performance.	
☑ Communicate this approach to the team and consistently apply.			
☑ Recognize contributions of team members.			

B. Rationale

An overarching goal of the T&E WIPT should be to expedite approval of and oversee execution of TEMP's so as not to delay program execution, to inform design reviews, and to oversee T&E activities. This can be accomplished by early involvement in acquisition programs by DT&E personnel starting with the Program Manager chartering a T&E WIPT with the Chief Developmental Tester to set schedules and locations for meetings and shape agendas. The charter should identify the background, purpose, goals, membership, and governance of the T&E WIPT.

Public Law 111-23, "Weapon System Acquisition Reform Act of 2009," May 22, 2009, established DASD(DT&E) to provide assistance to program offices as they are developing their acquisition strategies prior to the start of development, and then oversee program office efforts to implement the strategies. The DASD(DT&E) is expected to review and approve acquisition planning documents for major defense acquisition programs, as well as monitor program execution (GAO-11-806, "Actions Needed to Address Systems Engineering and Developmental Testing Challenges"). DASD(DT&E) participation can be accomplished by means of membership in the T&E WIPT.

In July 1999, the USD(AT&L) reaffirmed the Department's commitment to the integrated product and process development (IPPD) concept of using IPTs throughout the acquisition process. Those IPPD and IPT concepts are described in *Rules of the Road: A Guide for Leading Successful Integrated Product Teams*. This guide is designed to assist the program manager and supporting acquisition community in developing and executing high-performance IPTs. The purpose of IPTs is to facilitate decision making by making recommendations based on timely input from the entire team.

Test Strategy IPT

The purpose of the IPT is to assist in outlining the Test and Evaluation Master Plan (TEMP) for a major program. The objective of such an IPT is to reach agreement on the strategy and plan by identifying and resolving issues early, understanding the issues and the rationale for the approach, and, finally, documenting a quality TEMP that is acceptable to all organizational levels the first time.

Example given:

A T&E WIPT was chartered to support the Biometrics Automated Toolset (BAT), field tested in Kosovo and then sent to Iraq with a Marine Corps unit in 2003, which, along with other WIPTs used in the program, were attributed for the successful rapid response of this program and the eventual adoption of the capabilities by other government agencies.

C. Sources

- “Shaping the Way Ahead: Army Biometrics WIPT Kickoff,” Defense AT&L, July-August 2011, pp. 27-32, by Nicole Daniel, Kevin Trissell, and Richard Hansen.
- *Rules of the Road: A Guide for Leading Successful Integrated Product Teams*, Under Secretary of Defense for Acquisition, Technology and Logistics and Assistant Secretary of Defense for Command, Control, Communications & Intelligence (C³I), Rev. 1, 1999.
- Department of the Army Pamphlet 73-1 (DA PAM 73-1), *Test and Evaluation in Support of Systems Acquisition*, Headquarters Department of the Army, Washington, DC, 30 May 2003.
- Defense Acquisition Guidebook, Defense Acquisition University, July 29, 2011, (Pending Update)
- BP 11-008 – Developing T&E Cost and Schedule Estimates

Suggested Key Words: T&E WIPT; Working Level Integrated Product Team; IPT; Integrated Product Team; acquisition strategy; contract, technology development strategy; AoA; Request for Proposal; RFP; Statement of Work; SOW; Contract Data Requirements List; CDRL

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Bin Descriptor:
Acquisition Milestone/Phase Actions, Requirements/Materiel Solutions Phase, T&E WIPT

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Appendix B

Documents Developed and in Process

This appendix has four sections: the best practices developed and entered into the DT&E Forum; best practices that were in progress when the effort was concluded; best practices considered for development; and additional papers.

Best practices are primarily aimed at two distinct types of users: (1) those working in or supporting a program office in a T&E organization that is developing or executing a DT&E program and (2) testers having to design specific test events (Note: no distinction is made herein between the two types of users, the number designators, and order of presentation). Each best practice is accompanied by a checklist of recommended actions to realize the best practice and the rationale for it – the rationale having been derived from “Lessons Learned” from a variety of sources as described in the main text. These sources are hyperlinked to the best practice.

The second section contains additional best practices specifically drawn from lessons learned from reports and podcasts from the SETP.

The third section includes potential best practices that could be derived from 2011 Proceedings Papers.

The fourth section contains the names of two additional papers considered to be of interest for future work in this area.

Best Practices and Lessons Learned

Developed and Entered into the DT&E Forum

BP11-001v2: Aircraft Weapons System Evaluations of Air-to-Air Weapons

Perform fighter air-to-air weapons DT&E in the mission-oriented context of the total weapon system (aircraft-aircrew- weapon-under-test, and supporting off-board systems) executing the engagement kill-chain in realistic operational environments, including threat representative electromagnetic environments and targets. (WSEP Lessons Learned)

BP11-002v2: Use M&S for T&E Planning, Prediction, and Analysis

Use modeling and simulation (M&S) to plan test events; pre-test predictions; data analysis, and to supplement testing when live events are not available or affordable. Use M&S to gain insight into technical and functional capabilities using live, virtual, and constructive simulation in different environments and scenarios, and to provide surrogate data for filling out test scenarios with threats, targets, and other participants. However, use M&S for which verification, validation, and accreditation (VV&A) has been tailored to ensure that the model is appropriate for the specific application to be used.

BP11-004: Incorporate Operationally Trained Testers/Users/Operators into DT&E Events

Plan and design DT&E events to incorporate test team members operationally trained in relevant threat and battlespace environments, and in tactics, techniques, and procedures (TTPs) as required to measure performance in a mission-oriented context and interoperability events.

BP11-005: DT&E Tracking and Confirmation of the Technology Readiness Level (TRL) of Critical Technology Elements (CTEs)

Use government DT&E personnel for tracking, assessing, and reporting maturation progress of CTEs throughout the development and acquisition process. Require government DT&E responsibilities in plans for conducting DT&E events as needed to assess CTE maturity associated with each materiel solution, including technology maturity, integration risk, manufacturing feasibility, and, where necessary, technology maturation and demonstration needs.

BP11-007: Aircraft Stores Compatibility Developmental Test and Evaluation (DT&E)

Characterize, explain, and resolve major aerodynamic and mechanical aircraft stores inflight and separation compatibility issues using ground test facilities and modeling and simulation prior to flight testing. (Eglin AFB Lessons Learned Database)

BP11-008: Effective and Reliable T&E Cost Estimates

Develop realistic costs estimates to plan, execute, and report a robust DT&E program that will provide early detection and correction of developmental deficiencies. Incorporate these costs into the acquisition strategy, analysis of alternatives (AoA), evaluation plans, and Test and Evaluation Master Plan (TEMP) resource sections; and ensure consistency with other budgetary and programming documentation such as T&E-1, R-2, R-3, and R-4.

BP11-013: Rapid Response DT&E for Incremental Improvements and Retrofitting

Plan and execute a streamlined DT&E program for deployed systems requiring rapid response to incremental improvements and retrofitting that focuses on minimum essential safety, capabilities, and limitations to meet “operationally useful” or “operationally acceptable” criteria as may have been established by Combatant Commanders.

BP11-014: Configuration Traceability Impacts on Reporting Test

Identify and record the exact configuration of the system under test (SUT), and of the test environment including threats and targets, for each test event. Address impacts of deviations from expected final configurations and test environments when evaluating and reporting test results, system maturity, and mission capability to decision makers.

BP11-015: Establish a High Performing T&E WIPT

Charter a T&E WIPT to advise and develop the T&E program for TEMPs and acquisition strategies, cost and schedule planning for tradeoff analyses, insertions into programmatic and contractual documents, oversee progress in testing execution, to oversee data management and configuration tracking, to inform progress and assessment reviews, and to advise on T&E program issues.

BP11-017: Testing Dive Recovery Error Budgets for Automatic Ground Collision and Terrain Avoidance Systems

Perform a detailed dive recovery error budget analysis during flight test planning of automatic ground collision and terrain avoidance systems as a flight test safety special interest item. (SETP Lessons Learned)

BP11-018: DT&E of Unmanned Vehicle C² Systems

Involve experienced or trained operators in the planning and execution of DT&E (including early DT&E) and Integrated T&E to address the command and control (C²) utility of unmanned or autonomous vehicle systems in development, but carefully constrain their role to ensure test objectives are achieved without bias from legacy training and operations.

BP11-019: Ensure DT&E Strategy to Provide Sufficient Data to Inform Major Acquisition Decisions

Develop DT&E program strategy that will provide sufficient data to inform each acquisition milestone, design review, and the Assessment of Operational Test Readiness (AOTR) on progress of the acquisition program to achieving three key knowledge points: maturity of technology, product design, and manufacturing processes.

BP11-022: Milestone A TEMP Preparation for Prototype Developmental Test and Evaluation

Use personnel from government DT&E organizations experienced in applicable prototype technologies to help prepare the Milestone A Test and Evaluation Master Plan (TEMP).

BP11-024: Use Early Operational Experiences and Assessments to Confirm DT&E Program

Review Early Operational Assessments (EOAs) and Operational Assessment (OA) reports, results from Limited Utility Tests (LUTs), early training, and operationally-trained subject-matter expert assessments for potentially unsatisfactory operational issues or OTA concerns where changing or refocusing the DT&E program could lead to earlier fixes that would preclude unsuccessful Initial Operational Test and Evaluation (IOT&E) or Live Fire Test and Evaluation Program (LFT&E) events.

BP11-027: DT&E Participation in AoAs

Review and provide DT&E inputs to acquisition program Analysis of Alternatives (AoAs) to: 1) assess testability or evaluateability of each solution; 2) use as a source of information to develop evaluation plans, test designs, and TEMPs; and 3) ensure that alternatives consider any requirements for investments in new T&E capabilities and resources.

BP11-032: Encourage Embedded Instrumentation in Acquisition Strategy and T&E Planning

Encourage embedded instrumentation for on-board data sensing and collection, storage and/or real-time transmission during development of an Acquisition Strategy and/or Technology Development Strategy and analysis of alternatives (AoA); and specify T&E requirements and provisions in the statement of work and request for proposal.

BP11-035: Establish an Adjudication Process for Reliability, Availability, and Maintainability (RAM) Data

Charter and establish a RAM Integrated Process Team (IPT) or other working team of stakeholders to provide integrated planning and oversight of RAM data collection, analysis, categorization, and verification for adjudicating what should be scored as RAM

failures during developmental test and evaluation (DT&E) and operational test and evaluation (OT&E).

BP11-036: Use an Integrated Test Team for Test Planning, Test Execution Oversight, and Test Data Management

Establish and fund a government-led Integrated Test Team (ITT) that includes matrixed representatives from the Lead DT&E Organization, Operational Test Agency (OTA), prime contractor, and other stakeholder organizations that require system test data to accomplish their respective roles in assuring a program's success. This organization must operate through the Production and Deployment Phase of the program, and be empowered to perform test planning, oversee test execution, and manage all program test data.

BP11-038: Operational Realism in DTE for Rapid Acquisition

Emphasize operationally electromagnetic realism in DT&E from the onset of rapid acquisition programs.

BP11-045: Milestone A Test and Evaluation Master Plan (TEMP) Preparation and Development

Utilize the Lead DT&E Organization to help prepare and develop a Milestone A TEMP using the assistance and resources of the T&E WIPT to sort out the critical technology elements (CTEs) to be demonstrated during the Technology Development (TD) phase, and to develop the DT&E strategy and resources required to demonstrate achievement Technology Readiness Level 6 in a mission-oriented context.

BP 11-052: Testing in Realistic Electromagnetic Environments

Test systems in a mission-oriented context with realistic military and civilian electromagnetic environments.

BP11-058: Design and Implement a RAM Data Collection Process

Implement a RAM data collection process from program onset that provides early learning and knowledge of design and integration issues that can be used to demonstrate reliability growth, that can contribute to an assessment of suitability, and that will help project probability of mission success in deployed systems. Data should be collected from contractor laboratory tests and experiments for intended end items, as well as during all contractor and government developmental testing, live fire testing, and operational testing.

BP11-060: Establish Description of “Mission-Oriented Context” Early

Design and perform DT&E that will be in a “mission-oriented context” from the onset of a development and acquisition program in order to relate technical performance and functional measures to the intended operational missions and environments.

Maintain the pedigree of the mission-oriented context such that a consistent definition of “operational realism” can be injected into DT&E and Integrated T&E throughout the acquisition program’s lifecycle.

BP12-001: Integrated Master T&E Schedule and Planning Factors

Construct DT&E program schedules that account for realistic planning factors for capabilities and limitations of supporting resources, certification and investment lead-times, needs for retesting and excursions, dependencies on operational and other developmental programs, and unknown unknowns.

BP12-002: DT&E of C4I/System of Systems

Use networked live, virtual, and constructive (LVC) simulation to supplement DT&E of C4I and systems-of-systems to evaluate data exchange within defined environments, to validate interoperability as an input to the Net Ready KPP, to certify information assurance, and where applicable, to evaluate end-to-end kill chain operational capability in a joint and dense threat environment.

BP 12 –003v1: Aircraft DT&E Planning Factors

Construct DT&E program schedules that account for realistic planning factors for aircraft development to account for capabilities and limitations of supporting resources, certification and investment lead-times, needs for retesting and excursions, dependencies on operational and other developmental programs, and unknown unknowns.

Best Practices In-Progress

(Derived from Proceedings of the Society of Experimental Test Pilots)

BP 11 – 004v1: Air-to-Air Refueling (AAR) Qualification Testing

Perform AAR qualification and certification testing using engineering analysis, ground testing, and flight testing for human factors evaluations, visibility assessments and lighting evaluations, proximity testing, mechanical and fuel compatibility testing, failure modes testing, handling quality evaluations for both the tanker and receiver, and envelope expansion based on the preliminary air-to-air refueling envelope.

BP 12 – 005v1: Weapons Qualification and Certification Testing

Perform weapon/stores compatibility qualification and certification flight testing in the context of testable requirements/specifications, operationally relevant envelopes, and usefulness of Basic Aircraft Limit (BAL) as indicator to approve to warfighter justification for flight clearance requests for envelope expansion BAL data.

BP 12 – 006v1: Flutter Testing for Weapons/Stores Compatibility

Require open-air flight flutter testing for weapon/stores compatibility qualification and certification to resolve uncertainties involving computational analysis and wind tunnel testing to provide accurate, useful, and safe operational envelopes for the warfighter.

BP 11 – 007v1: Aircrew Workload Analysis

Perform aircrew workload analysis as an integral element of the systems DT&E program; focusing on aircrew decision process of executing time sensitive kill chains required to accomplish a mission for highly integrated systems using fused information from both on-board and off-board systems. Include a comparative workload assessment of the “system under test” with the systems it will replace or complement when applicable.

**Potential Best Practices which could be derived
from 2011 Proceedings Papers**

Developmental Test of JSOW C-1 on the F/A-18E/F Super Hornet -- Podcast

Potential Best Practice on Human Factors, Safety, and Planning Factors

Authors: Lt Scott Johnson, (USN) and CDR Andrew McFarland, (USN)

- The JSOW C-1 variant is the first Net Enabled Weapons to be fielded within DOD (projected IOC 2013). Adds a Link-16 and new Moving Maritime Target (MMT) algorithms which will allow for a standoff Anti-Surface Warfare (ASuW) capability against ships at sea.

The Two Most Ominous Words in Flight Test: “Simple” and “Straightforward.” A Look at INTEGRATING MINES on the F/A-18E/F Super Hornet – Paper and Podcast

Potential Best Practice on Weapons Integration, Unknown-Unknowns, and Planning Factors

Authors: LCDR Joshua Filbey, USN and Kami Slagle

Lessons learned include:

- Any store, despite its age or ability to be carried on many aircraft, must be proven to be viable for use on each individual aircraft. ***We’re All in this Together – Lessons Learned from C-17 All-Weather Formation Testing – Paper and Podcast***

Potential Best Practice on Safety Planning, Planning Factors, Realistic Environments

Authors: LtCol James Hanley, (USAF) and Maj James Quashnock, (USAF)

The paper discusses how the test team incorporated lessons learned from three different formation systems to confidently test, evaluate and field the C-17 Formation Flight System.

Project Dragon Spear: Weaponizing the MC-130w – Paper

Potential Best Practice on Lean Test Team, End-to-End Evaluation, and Planning Factors

Author: Maj Andy Jutte, (USAF)

- The Project Dragon Spear team tested and validated integrated ISR and precision strike solutions using a modular and palletized Precision Strike Package concept.
- To facilitate the rapid acquisition concept of Project Dragon Spear, the 46th Test Wing stood up the Dragon Spear Combined Test Force (CTF), composed of subject matter experts from three test squadrons in the areas of precision strike, C4ISR, and special operations aircraft flight test.

Additional Papers of Interest for Future Work

F/A-18C/D Litening Pod Loads Envelope Expansion Lessons Learned – Paper and Podcast

This paper addresses risk mitigation measures, how these problems were identified and solved throughout the flight test program and lessons learned from this test program that can be passed on to other test organizations.

E-2D Advanced Hawkeye Carrier Suitability and Structural Demonstration – Paper and Podcast

This presentation provided lessons learned through the test planning process, buildup, execution, and reporting of carrier suitability structural demonstration testing with specific emphasis on risk mitigation strategies for this high risk testing.

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Appendix C

DT&E Forum User's Guide

This material is provided under separate cover so that it can more easily be distributed to website users. It consists of two parts: DT&E Forum Quick Start User's Guide and an annex to it, DT&E Forum Administrator's Guide, which describes the DT&E Forum's administration functions.

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Appendix D

September 19, 2011, Version of Website Requirements

On September 19, 2011, DT&E provided the IDA team with the final formal version of the concept for the DT&E Forum website in Microsoft Power Point format. The nine screens from that file are shown in this appendix.



Figure D-1. Home Page



Figure D-2.



Figure D-3.



Figure D-4.



Figure D-5.



Figure D-6.



Figure D-7.



Figure D-8.



Figure D-9.

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Appendix E

AT&L Deployment Timeline for DT&E Forum Website

This appendix contains the steps that AT&L provided in its timeline for the deployment of the DT&E Forum website.

DT&E Deployment Timeline



DT&E = DT&E Development/ Management Team				
AT&L = eBusiness Operations, Information Assurance or Portfolio Management				
EITSD = Enterprise IT Services Directorate Information Assurance, Executive Change Control Board (ECCB)				
Product Owner = Government customer or designated representative				
Item	Task (in logical order)	Due Date	Assignee	
1	Complete the RFC and Business Needs Analysis (BNA) Documentation. Return to ATL	ASAP	DT&E	Documentation needs to be completed within first two weeks. Samples provided to DT&E by James Monroe.
2	Designate IAO to be POC for eMASS and DIACAP Process		AT&L	Complete as of 10/14/11 by James Cumming
3	Complete and return DITPR Questionnaire	ASAP	DT&E	Questionnaire emailed to Shelly Wilson by James Monroe Due 90 days prior to final deployment
3a	Obtain Access to DITPR https://ditpr.dod.mil/dodcio/?indexID=2	ASAP	DT&E	Pending Due 60 days prior to final deployment
4	Register DT&E in eMASS (Required workflow interface for DIACAP).		AT&L	Complete 10/14/11. AT&L has done this for you
5	Coordinate for / Attend ECCB for Business Approval.	ASAP	AT&L, DT&E	Pending completion of item 1
6	Address all IA controls, and upload applicable artifacts into eMASS		DT&E	Controls were sent 10/14/11 by James Cummings for review. Pending Review
7	Create DITPR & Snap- IT Entry		AT&L	Pending completion of Item 3
8	Forward C&A package to EITSD for approval.		AT&L	Pending completion of item 6
9	Complete Application Development/ Coding		DT&E	
10	Deliver all code, database and installation/configuration instructions to AT&L engineers		DT&E	

Item	Task (in logical order)	Due Date	Assignee	Status
11	Run Ounce/ Fortify (code vulnerability) scans on source code and send results to DT&E developers for review, justification or remediation.		AT&L	Dependent on Item 10
12	Justify all Ounce vulnerabilities or modify application code to remediate. Return all documentation and/ or changes to AT&L		DT&E	Dependent on receiving item 11
13	Submit Ounce/ Fortify Documentation to ATL IA for review and approval		AT&L	Dependent on receiving item 12
14	Once approved Install Final application code /databases into ATL MAE STAGING environment only if no code changes are required as a result of vulnerability remediation (If changes are required to application re-submit new code for new Ounce/ Fortify Scans repeating items 11 and 12).		AT&L	Dependent on receiving item 13
15	EITSD conducts scan of STAGING servers with application code loaded (subject to EITSD scheduling)		EITSD	Advance coordination 10 days required. Required for ECCB scheduling
16	I&E conducts User Acceptance Testing in STAGING environment		DT&E/ Product Owner	Can coordinate with AT&L for testing space. If UAT locates significant areas for rework- ATL will reevaluate timeline and adjust to accommodate additional ounce scans and schedule new testing dates.
17	User Acceptance Testing (UAT) Form is signed and returned to ATL by product owner (GOV)		DT&E Product Owner/ GOV	
18	AT&L IA approves Ounce/ Fortify scan justifications		AT&L	

Item	Task (in logical order)	Due Date	Assignee	Status
19	Results of EITSD STAGING server scan delivered to AT&L		EITSD	
20	AT&L submits request to include DT&E approval on ECCB agenda		AT&L	
21	Authority To Operate (ATO) issued prior to deployment		EITSD	Items 19 and 20 may be completed in any order, but both must be approved to go to PROD
22	Attend ECCB and obtain production approval		EITSD/AT&L	Items 19 and 20 may be completed in any order, but both must be approved to go to PROD
23	Submit System Change Notification (SCN) for approval with ECCB approval, IA approval, UAT attached		AT&L	
24	Forward copy of the DT&E ATO to I&E		AT&L	
25	Deploy DT&E to production servers		AT&L	<i>Deployment date dependent on completion of previous tasks.</i>

Planning Note: Steps 9- 25 take approximately 30- 40 days to fully execute.

Appendix F

AT&L Documents Completed for DT&E Forum

To ensure the widest distribution of this document, this appendix, which is FOR OFFICIAL USE ONLY, is published under separate cover. It contains the six documents that AT&L required DASD(DT&E) to submit as part of the effort for AT&L to host the DT&E Forum website on one of AT&L's servers:

- e Business Needs Analyses (BNA)
- Memorandum of Agreement (MOA)
- Request For Change (RFC)
- Application Operational Requirements Questionnaire
- DoD IT Portfolio Repository (DITPR)
- Privacy Impact Assessment Form (DD Form 2930)

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Appendix G

References

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Appendix H

Glossary of Terms Used in Best Practices

ACAT	Acquisition Category
ADM	Acquisition Decision Memorandum
AFOTEC	Air Force Operational Test and Evaluation Center
AHE	Advanced Hawkeye
AIS	Automated Information System
AO	Action Officer
AoA	Analysis of Alternatives
AOTR	Assessment of Operational Test Readiness
APB	Acquisition Program Baseline
ART	Available Reaction Time
ASR	Acquisition Strategy Report
ATEC	Army Test and Evaluation Command
ATIRCM	Advanced Infrared Countermeasures
ATS	Automated Test Systems
BAT	Biometrics Automated Toolset
BIC	Business Initiatives Council
BLRIP	Beyond Low Rate Initial Production
C2	Command and Control
CAPE	Cost Assessment and Program Evaluation
CBA	Capabilities Based Assessment
CDD	Capability Development Document
CDR	Critical Design Review
CDRL	Contract Data Requirements List
CDT	Chief Developmental Tester
CFD	Computational Fluid Dynamics
CFIT	Controlled Flight Into Terrain
CJCSI	Chairman, Joint Chiefs of Staff Instruction
CJCSM	Chairman, Joint Chiefs of Staff Manual
CND	Computer Network Defense
CNO	Chief, Naval Operations
COI	Critical Operational Issue
COMOPTEVFOR	Commander, Operational Test and Evaluation Force
CONOPS	Concept of Operations
COTS	Commercial Off-The-Shelf
CPD	Capability Production Document
CPI	Critical Program Information

CTA	Capstone Threat Assessment
CTE	Critical technology element
CTF	Combined Test Force
CTP	Critical Technical Parameter
DAB	Defense Acquisition Board
DAES	Defense Acquisition Executive Summary
DAG	Defense Acquisition Guidebook
DAMIR	Defense Acquisition Management Information Retrieval
DAPS	Defense Acquisition Program Support
DCACAS	Data Collection, Analysis, and Corrective Action System
DCAPE	Director of Cost Assessment and Program Evaluation
DCR	DOTMLPF Change Request
DDR&E	Director, Defense Research and Engineering
DDT&E	Director of Developmental Test and Evaluation
DIACAP	DoD Information Assurance Certification and Accreditation Process
DISA	Defense Information Systems Agency
DMS	Digital Modeling and Simulation (Simulation Facility)
DODAF	Department of Defense Architecture Framework
DOE	Design of Experiments
DOT&E	Director of Operational Test and Evaluation
DOTMLPF	Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel & Facilities
DPS	Defense Planning Scenarios
DR	Deficiency Report
DSB	Defense Science Board
DT&E	Developmental Test and Evaluation
ECM	Electronic Counter Measures
EISS	Enhanced Integrated Sensor Suite
EMD	Engineering and Manufacturing Development
EMP	Electro-Magnetic Pulse
EO	Electro-Optical
EOA	Early Operational Assessment
FCB	Functional Capabilities Board
FOC	Full Operational Capability
FOT&E	Follow-On Test & Evaluation
FRP	Full Rate Production
GCAS	Ground Collision Avoidance System
GCTA	Ground Collision and Terrain Avoidance
GLOC	G-Induced Loss of Consciousness

HIS	Human Systems Integration
HWIL	Hardware-in-the-loop (facility)
IA	Information Assurance
ICD	Initial Capability Document
ICE	Independent Cost Estimate
IFR	Instrument Flight Rules
IL	Integration Laboratory
IOC	Initial Operational Capability
IOT&E	Initial Operational Test and Evaluation
IPL	Integrated Priority List
IPPD	Integrated Product and Process Development
IPT	Integrated Product Team
IR	Infrared
IRT	Independent Review Team
ISP	Information Support Plan
ISTF	Installed-system test facility
IT	Information Technology
IT&E	Integrated Test and Evaluation
ITT	Integrated Test Team
JCB	Joint Capabilities Board
JCIDS	Joint Capabilities Integration and Development System
JITC	Joint Interoperability Test Command
JMETC	Joint Mission Environment Test Capability
JRMET	Joint Reliability and Maintainability Evaluation Team
JROC	Joint Requirements Oversight Council
JTRS	Joint Tactical Radio System
JUON	Joint Urgent Operational Need
KM/DS	Knowledge Management/Decision Support
KPP	Key Performance Parameter
KSA	Key System Attribute
LCCE	Life Cycle Cost Estimate
LCSP	Life Cycle Sustainment Plan
LDTO	Lead DT&E Organization
LFT&E	Live Fire Test and Evaluation
LRIP	Low Rate Initial Production
LVC	Live, Virtual, or Constructive
M&S	Modeling and Simulation
MAC	Mission Assurance Category
MAIS	Major Automated Information System
MBTD	Mission Based Test Design

MCE	Mission Control Element
MCOTEA	Marine Corps Operational Test and Evaluation Activity
MDA	Milestone Decision Authority
MDAP	Major Defense Acquisition Program
MDD	Materiel Development Decision
MF	Measurement facility (precision measurement facility)
MIDS	Multifunctional Information Distribution System
MoE	Measure of Effectiveness
MoP	Measure of Performance
MoS	Measure of Suitability
MS	Milestone
MSA	Materiel Solution Analysis
NR KPP	Net-Ready Key Performance Parameter
NSS	National Security System
OA	Operational assessment
OAR	Open-Air Range
OCA	Office of Cost Assessment
OIPT	Overarching Integrated Product Team
OPLANS	Operation Plans
ORD	Operational Requirements Document
OSD	Office of the Secretary of Defense
OT&E	Operational Test and Evaluation
OTA	Operational Test Agency
OTRR	Operational Test Readiness Review
P&D	Production and Deployment
PARCA	Performance Assessment and Root Cause Analysis
PDR	Preliminary Design Review
PEO	Program Executive Officer
PM	Program Manager
PMO	Program Management Office
POR	Program of Record
PPP	Program Protection Plan
PSR	Program Support Review
PTO	Participating Test Organization
RAM	Reliability, availability, and maintainability
RAM-C	Reliability, Availability, Maintainability – Cost
RFP	Request for Proposal
ROE	Rules of Engagement
RTO	Responsible Test Organization
SAE	Service Acquisition Executive
SEP	System Engineering Plan
SIL	System Integration Laboratory

SME	Subject Matter Expert
SOW	Statement of Work
STA	System Threat Assessment
STAR	System Threat Assessment Report
STAT	Scientific Test and Analysis Techniques
STR	Software Trouble Report
SUT	System Under Test
SVP	Sound Velocity Profile
T&E	Test and Evaluation
T&E WIPT	T&E Working-level Integrated Product Team
TDS	Technology Development Strategy
TDSB	Test Data Scoring Board
TEMP	Test and Evaluation Master Plan
TEMPEST	Transient Electro-Magnetic Pulse Emanation Standard
TES	Test and Evaluation Strategy
TIR	Test Incident Report
TLAM	Tomahawk Land Attack Missile
TRA	Technology Readiness Assessment
TRL	Technology Readiness Level
TRMC	Test Resource Management Center
TSPI	Time Space Position Information
TTP	Tactics, Techniques and Procedures
UAV	Unmanned Aerial Vehicle
USC	United States Code
USD(AT&L)	Under Secretary of Defense (Acquisition, Technology & Logistics)
V&V	Verification and validation
VISTA	Variable Stability In-Flight Simulator Test Aircraft
VV&A	Verification, validation, and accreditation
WAS	Wide Area Search
WBS	Work Breakdown Structure
WIPT	Working Integrated Product Team

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Appendix I

Acronyms and Abbreviations in this Document

AIAA	American Institute of Aeronautics and Astronautics
AAR	Air-to-Air Refueling
AoA	Analysis of Alternatives
AOTR	Assessment of Operational Test Readiness
BAL	Basic Aircraft Limit
BAT	Biometrics Automated Toolset
BNA	Business Needs Analyses
BPLL	Best Practices and Lessons Learned
C2	command and control
CAC	Common Access Card
CDT	Chief Developmental Tester
CDRL	Contract Data Requirements List
CTE	Critical Technology Element
DASD(DT&E)	Deputy Assistant Secretary of Defense, Developmental Test and Evaluation
DAU	Defense Acquisition University
DITPR	DoD IT Portfolio Repository
DSB	Defense Science Board
DT&E	developmental test and evaluation
DTAP	Defense Technology Area Plan
EITSD	Enterprise IT Services Directorate
EOA	Early Operational Assessment
GAO	Government Accountability Office
I&E	Installations and Environment
IDSS	interoperability decision support system
IPPD	integrated product and process development
IPT	Integrated Product Team
ITEA	International Test and Evaluation Association
ITT	Integrated Test Team
LCSP	Life-Cycle Sustainment Plan
LDTO	Lead Developmental Test and Evaluation Organization

LFT&E	Live Fire Test and Evaluation Program
LUT	Limited Utility Test
LVC	live, virtual, and constructive
M&S	modeling and simulation
MOA	Memorandum of Agreement
MUOS	Mobile User Objective System
OA	Operational Assessment
ODASD(DT&E)	Office of the Deputy Assistant Secretary of Defense for DT&E
OIPT	Overarching Integrated Product Team
OT&E	operational test and evaluation
OUSD(AT&L)	Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics
POA&M	Plan of Action and Milestones
POC	point of contact
PTO	participating test organization
RAM	Reliability, Availability, and Maintainability
RFC	Request For Change
RFP	Request for Proposal
SETP	Society of Experimental Test Pilots
SOW	Statement of Work
SUT	system under test
T&E	test and evaluation
T&E WIPT	T&E Working Level Integrated Product Team
TD	Technology Development
TEMP	Test and Evaluation Master Plan
TRMC	Test Resource Management Center
TTPs	tactics, techniques, and procedures
UAT	User Acceptance Testing
UI	user interface
VV&A	verification, validation, and accreditation
WIPT	Working-Level Integrated Product Team
WSEP	Weapons System Evaluation Program

Appendix J

List of Illustrations

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