# IETM User-Interaction ("Look-and-Feel") Guidelines

## Aerospace Industries Association

## and

## Tri-Service IETM Technology Working Group

### AIA and Tri-Service IETMTWG Workshop

### 15-18 March 1999

### at Naval Surface Warfare Center, Carderock, Maryland

# 1. INTRODUCTION

## 1.1 Background

At the 1998 DoD Logistics Reform Day Symposium held at the Pentagon on 1 October 1998, there were a number of presentations and exhibits on Interactive Electronic Technical Manuals (IETMs). Individual Services and several Industrial activities displayed a number of exhibits showing state-of-the-art IETM Presentation Systems. In separate formal presentations, both the Assistant Deputy Undersecretary of Defense (Logistics Reinvention) and the Head of Technology and Business Integration of the Joint Electronic Commerce Project Office (JECPO) discussed efforts underway to achieve DoD-wide IETM Interoperability. At that Forum, a number of the participants suggested that an area in need of additional standardization was that of IETM user-interaction features; i.e. the look-and-feel of IETMs. At that time, representatives of the Aerospace Industries Association (AIA) Service Publications Committee and of the Tri-Service IETM Technology Working Group (IETMTWG) agreed it would be desirable to hold a jointly sponsored Workshop to address this topic.

The IETM User-Interaction ("Look-and-Feel") Workshop resulting from this agreement was held at the Naval Surface Warfare Center Carderock Division, West Bethesda, Maryland on 15-18 March 1999. Invitees included representatives selected from the membership of the AIA Service Publications Committee and two representatives each from the Army, Navy , Air Force and Marine Corps.

This Report summarizes results of that Workshop and provides recommendations for further efforts to achieve DoD-wide standardization of IETMs, based on a common look-and-feel approach.

## 1.2 Purpose of Workshop

The purpose of the Workshop was to develop a recommended set of common IETM user-interaction features, which would apply to all DoD IETMs, and to provide guidelines for acquisition of IETMs employing these common look-and-feel features. These recommendations were to be based on lessons learned from the development and use of actual IETM presentation systems currently in use by the DoD.

While requirements for such IETM user-interaction features are currently provided in MIL-PRF-87268A[*] which served as the basic reference and source material for the Workshop, it was not the goal to rewrite or even modify MIL-PRF-87268A.

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[*] **MIL-PRF-87268A**. 1 October 1995. Military Specification. ***Manuals, Interactive Technical: General Content, Style, Format, and User-Interaction Requirements***.

*1.3*  **Scope of Workshop**

The scope of the Workshop was limited to consideration of IETM user-interaction (look-and-feel) principles; it did not consider content or source-data requirements.

The focus was on leading-edge (high-end) presentation systems.

*1.4*  **Workshop Participants**

In order to limit attendance to a reasonable number to achieve the purposes stated above, the Chairmen of the AIA Service Publications Committee and the Tri-Service IETMTWG decided on a "By-Invitation Only" Workshop of approximately 15-20 participants.  The AIA selected a representative group of companies experienced in IETM Presentation-System development and in the implementation of IETMs in support of military weapon-system programs.  Each of the four Service representatives to the Tri-Service IETMTWG selected two participants experienced in IETM technology and applications.

The following AIA companies, and Government activities and their support contractors, participated in the Workshop:

> **AIA:**  **Boeing,  General Dynamics,  Litton Data Systems, Northrop Grumman,  Pratt & Whitney,  Raytheon**
>
> **IETMTWG**:  **Air Force (PDSM, Wright Patterson AFB),**
> **Army (AMCOM, Redstone Arsenal; 584th Maintenance Company, Ft. Campbell),**
> **Navy (NSWC Carderock; AERA [NAVSEA]), and**
> **USMC (MARCORSYSCOM, Quantico; MKI).**

The participants had hands-on experience and detailed technical understanding of the following IETM authoring and presentation systems:

- AIMSS
- Data Courier
- Dynatext
- EMS-2
- F-22 IMIS
- F-100 IETM

- IADS
- InfoAccess
- JIMIS
- MediaLynk
- TechSight
- Quill 21

A list of participants is given in Appendix A.

## 1.5   *Workshop Approach*

The Workshop took the following approach:

- Determine IETM user-interaction categories

- Develop an initial set of common IETM user-interaction features

- Share lessons learned from developers of leading-edge IETM presentation systems

- Revise the set of common IETM features based on the lessons-learned discussion

- Prepare IETM user-interaction guidelines

- Provide recommendations

## 1.6   *IETM User-Interaction Categories*

The following user-interaction categories were identified as those for which establishment of common look-and-feel requirements is desirable:

- Display Format

- Browse Capability

- Link Behavior/ Navigation

- Control Bars

- Icon Standardization

- Selectable Elements (Hot Spots)

- Warnings, Cautions, Notes

- Search & Lookup

- Session Control (Suspend, Resume, Nested sessions)

- Context Filtering

- Screen Resolution & Color Graphics

- Information Access (Indices, Electronic TOCs, etc.)

- Dialogs

- Sound

- Voice I/O

- Graphics

- Hardware User Interface

- Performance (Response Time by Context)

- Printer Output

- User Annotations (e.g., comments, user notes, redlines, bookmarks)

- Feedback to Originator (e.g., TMDRs, Form-2028, AFTO 22)

- Administrative Information (e.g., effectiveness, authorization, distribution, Validation/Verification)

- Interface to External systems

- Rapid Action Changes (RAC)/Critical Safety interim Messages

- Specific treatment for Major Information Types (e.g., troubleshooting, procedural data, parts, descriptive, etc.)

The substance of this Report includes recommendations in each of these look-and-feel categories.

## 1.7    *Remainder of Report*

Section 2 of this Report provides guidelines for IETM user- interaction features to be used for acquisition of IETM products.  Preparation of these guidelines was the primary output of the Workshop.  Appendix A  provides a list of participants in the Workshop.

# 2. IETM USER-INTERACTION GUIDELINES

## 2.1 Display Format (Text/font, graphic, table, lists, Object Embedding)

-Use Best Commercial Practices

-Use of multiple frames (formerly "panes") is not a requirement

## 2.2 Browse Capability

-Browse capability should be available

    -User controlled access mode

    -No tracking of activities

    -Not rigidly tied to IETM controls

## 2.3 Link Behavior/Navigation

-Persistent visual indication of link(s) to additional information should be available.

-There should be a visual indication of how the link behaves (e.g., goto, gosub, relational)

-If you are executing a link that is not a goto or exit link, you should be able to return at anytime to where the link began.

## 2.4 Control Bars

-The User Navigation Panel (Tool Bar) should provide the necessary choices/options available at the current time.

-The User Navigation Panel is required with an optional toggle capability to turn it off.

-The User Navigation Panel should remain accessible by persistent visible indication.

-Use the standard icons when applicable in the User Navigation Panel.

## 2.5 Icon Standardization

-An icon should show its name or function when the cursor is stalled over the icon.

-Suggested Icons for standardization:

+Next

+Previous [Chronological]

+Return [Chronological]

+Back [Logical]

+TOC

+Exit

+Find/Search

+Undo

+User Navigation Panel Minimized

+Processing Indication

+Parts (IPB/RPSTL)

+Suggested Changes/Feedback

+Training

+Multimedia Icon

+Sound/Voice Icon

+Full Motion Video Icon

+Animation Icon

+Graphic

+Diagnostics

+Warning

+Caution

+Note

+Hazards per AIA PUB 119 / Icons included in MIL-STD-38784

+Print

+One way link (Goto)

+Two way link (Gosub)

+Relational link

+Browse

## 2.6 *Selectable Elements (Hot-Spots)*

-All Hot Spots must be visually indicated (e.g, fill pattern, reverse video, outline, button, underline…)

-There are three acceptable modes of visual indication of hot-spots (selectable areas).

-Persistent visual indication that an area is hot

-Cursor changing shape/color

-Object changes while cursor over area (e.g. IPB callout expands…)

-There should be an indication of link destination (target) when the cursor passes over the hot-spot.

## 2.7 *Warnings, Cautions, Notes*

-User must acknowledge pop up warnings and cautions before proceeding.

-Pop up alerts should be centered on the screen

-A persistent icon should appear on the screen when alert is applicable.

-Alerts should appear in standard colors: Red – Warning, Yellow – Caution, Cyan – Note.

## 2.8 *Search & Lookup*

-Use the standard icon to get the user into a search mode.

-The user should be presented with the search options available.

-At a minimum, a Keyword search against valid entry points (TOC/List of Content) should be available

-The system should provide a search capability against Metadata (e.g. Keywords, tagged data, indexable data, searchable data, etc.) when it exists.

## 2.9 *Session Control (Suspend, Resume, Nested Sessions)*

-The user should be able to suspend a session at any time.  (e.g., Break, Emergency, No Parts)

-A subsequent resume should be capable of re-starting the session at the same point it was suspended.

-At the time of resume, the user should be advised that some key parameters/condition settings may be out-of-date (e.g. aircraft safe for maintenance, temperature change, or other people worked on the end-item/platform during the suspension)

-The system should support the three Exit Modes:

    -Complete      (Save and update history)

    -Abort            (Don't save or update history)

    -Suspend      (See above)

## 2.10    *Context Filtering*

-The system should have the ability to perform context filtering on effectivity as a minimum.

-The system should provide the user a mechanism for entering/modifying configuration parameters.

## 2.11    *Screen Resolution and Color Guidelines*

-Presentation system and graphics developers should consider the use of standard "safe" colors visible across multiple presentation systems.

-Presentation systems should not presume any fixed display resolution, or size.

## 2.12    *Information Access (Indices, Electronic TOC's, etc.)*

-A Table/List of all key entry points should be made available for user access.

-Access should be provided via a Hierarchical Breakdown such as:

-SSSN (MIL-STD-1808)

    -LCN

    -AECMA 1000D

    -Functional and Physical Hierarchy

-Graphical Interfaces are acceptable.

## 2.13    *Dialogs*

-Support should be provided for both pop-up dialog box and in-line dialogs in the display frame itself.

-Developers should use Best Commercial Practices for entering data in dialog boxes (e.g. radio buttons, check-boxes, fill-ins, combo boxes, scrolling selection lists, etc.)

## 2.14 Sound

-Developers should use Best Commercial Practices when implementing sound.

-The user must take action to hear the sound. (No automatic playing of sound.)

-User controls muting and volume via system controls (versus embedded controls within the application). Optional: Application can provide convenient access to the system controls.

## 2.15 Voice I/O

-Voice I/O should be used only as supplemental input/output and navigation.  Keyboard and pointing devices should be the primary input, and visual display should be the primary output.

## 2.16 Graphics

-Developers should use Best Commercial Practices for graphics format and display.

-Preferred Vector Graphics Std: CGM - WebCGM Type 4 Profile  (moving towards ISO Std)

## 2.17 Hardware User Interface: Point and Click, Voice, Selection Keys, A/N Keyboard, Touch Pad, etc.

-Point and click capability on target display should be assumed.

-Developers should accommodate the limitations of the target display device.

-Alphanumeric Input Capability must be provided, if not in hardware, then in software.

## 2.18 Performance (Response Time by Context)

-Developers should implement a 2 second response time goal.

-If the response time is greater than 2 seconds, the system should provide visual feedback to the user.

-Use a standard cursor for Processing Indication.

## 2.19 *Printer Output*

-Printer Output is strongly discouraged.

-Print capability should be used primarily for graphics.

-All printer output should have version number and/or printed date/time stamp

-When customer requires printed output:

  -Printer output should not have to conform to normal Paper TM Specifications

  -Satisfactory Options:

    -"pre-composed" files (such as Adobe PDF) can be attached

    -"on-the-fly" composition for printing (of logical element) built into the viewing application

    -Screen Print. Preferred method: print data content of Active Window only.

## 2.20 *User Annotations (e.g., comments, user notes, redlines, bookmarks)*

-There should be a persistent visual indication that an annotation exists.

The default initial presentation of annotations is to appear minimized.

-If there are levels of annotations (e.g., Public, Private, etc.), they should be visually differentiated.

## 2.21 *Feedback to Originator (e.g., TMDRS, Form-2028, AFTO 22)*

-A single user interaction should be available to select the function. (e.g., a Button, double mouse click)

-The preferred user interface is a form.

-The system should provide an output compatible with the user environment.

-There should be a "Form fill-in completed" function before returning to the IETM (e.g , "submit", "done", "okay", "close-out".)

-    The system should automatically generate an Electronic locator (e.g., Address, Version, …) and to the greatest extent possible, relevant fields on the Form should be automatically filled-in. (e.g. User Id, System State, etc.)

### 2.22 *Administrative Information (e.g. Effectivity, Authorization, Distribution, Val/Ver)*

-Administrative information should be displayable.

### 2.23 *Interface to External Systems*

-A single user interaction should electronically link to external references (e.g. another IETM) or external systems (e.g. CAMS, IMDS, FEDLOG, GCSS, Supply Support/Parts Ordering, etc.).

### 2.24 *Rapid Action Changes (IRAC)/Critical Safety Interim Messages*

-A visual indication of the existence of a critical change must be displayed in context.

-A single user interaction should be available to access the change.

-The user should be provided with a visual indication for critical messages at the start of the IETM.

### 2.25 *Major Data Types (e.g. Troubleshooting, Procedural, Parts, Descriptive, etc….)*

-Because of differences in user cultures and requirements this area cannot be addressed by providing guidance.  Lessons learned may be a better way to address this category

# APPENDIX A

# WORKSHOP PARTICIPANTS

| AIA | TRI-SERVICE IETMTWG |
|---|---|
| Warren Balish (AIA) | Bill Bates (USAF MSG/ILMP AFTMSS) |
| Chuck Dipman (Raytheon) | Joe Fuller (Chair Tri-Service IETMTWG, NSWCCD) |
| Terry Duren (Litton Data Systems) | Rich Gramly (Army AMCOM) |
| Jeff Hastings (Northrop Grumman) | Glenn Handrahan (NAVSEA-AERA) |
| Andrea Miller (Boeing) | Eric Jorgensen (Navy- NSWCCD) |
| Claire McClary (General Dynamics) | Nancy McDougall (USMC- MKI Systems) |
| Steve Switalski (Pratt & Whitney) | Russell Rice (USMC – MARCORSYSCOM, Quantico) |
| | Stead Rodgers (Army- 584th Maint Co, Ft. Campbell) |

Notes:

1. The designated AIA Service Publications Committee chairman for this Workshop, Mike Post of Boeing, was unable to attend the Workshop due to adverse weather conditions; but was in contact by telephone during the Workshop.

2. John Junod and Annette Singletary, both of NSWCCD, served as the secretariat for the Workshop.