

IETP Development and Implementation

16 Years of Experience – Lessons Learned

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16 Years of Experience – Lessons Learned

- **USA IETM/P History**
- **Authoring Tool Development**
- **Contractor Lessons Learned**
- **Customer Lessons Learned**
- **Conversion Lessons Learned**
- **Happenings Along The Way**



USA IETM/P History

US DoD IETM/P Standards

- US DoD IETM/P specifications MIL-PRF-87268 and MIL-PRF-87269 released in November 1992
 - Specifications (87268 and 87269) were too “loose” and out of date
- No IETP authoring tools existed; yet contracts were being let
- Program managers had to individually produce IETM/P requirements documents
 - IETMs became stove-piped within Programs
 - This Practice tied the Program to specific and expensive contractor-unique solutions
- Classes (1-5) were never official

Original Classes of IETM/Ps (USA Version)

<u>Type I</u> (ETMs)		<u>Type II</u> (IETPs)	
Class 1	Class 2, 3	Class 4	Class 5
Paper	Electronic Technical Manual (ETM)	Interactive Electronic Technical Manuals (IETM)	Class IV IETM and Electronic Infrastructure
Multiple Volumes	Electronic Emulation of Paper Manual	Fully Interactive IETM Provides Data When Needed to Maintainer, Leads Maintainer Down Maintenance Path, Allows for Reduced Training	IETM Linked to Maintenance Network
Not Linked or Integrated	Data Access Expedited by Page Turner and Hyperlinks	Maintainer Never Searches for Data	Integrated With Diagnostics
Maintainer Searches for Data	Reduced Maintainer Searching	Lower MMH / FH Low False Removals	Expedites Trouble-Shooting, Spare Ordering and Maintenance Planning
High MMH / FH High False Removals	High MMH / FH Reduced False Removals		Increased Availability



Authoring Tool Development

Authoring Tool Design

- **Emphasis on reuse**

- **Common Tasks**
- **Common Steps**
- **Common Alerts**
- **Common Graphics**
- **Common Parts**
- **Common Support Equipment**
- **Common Effectivities**
- **Common Consumables**

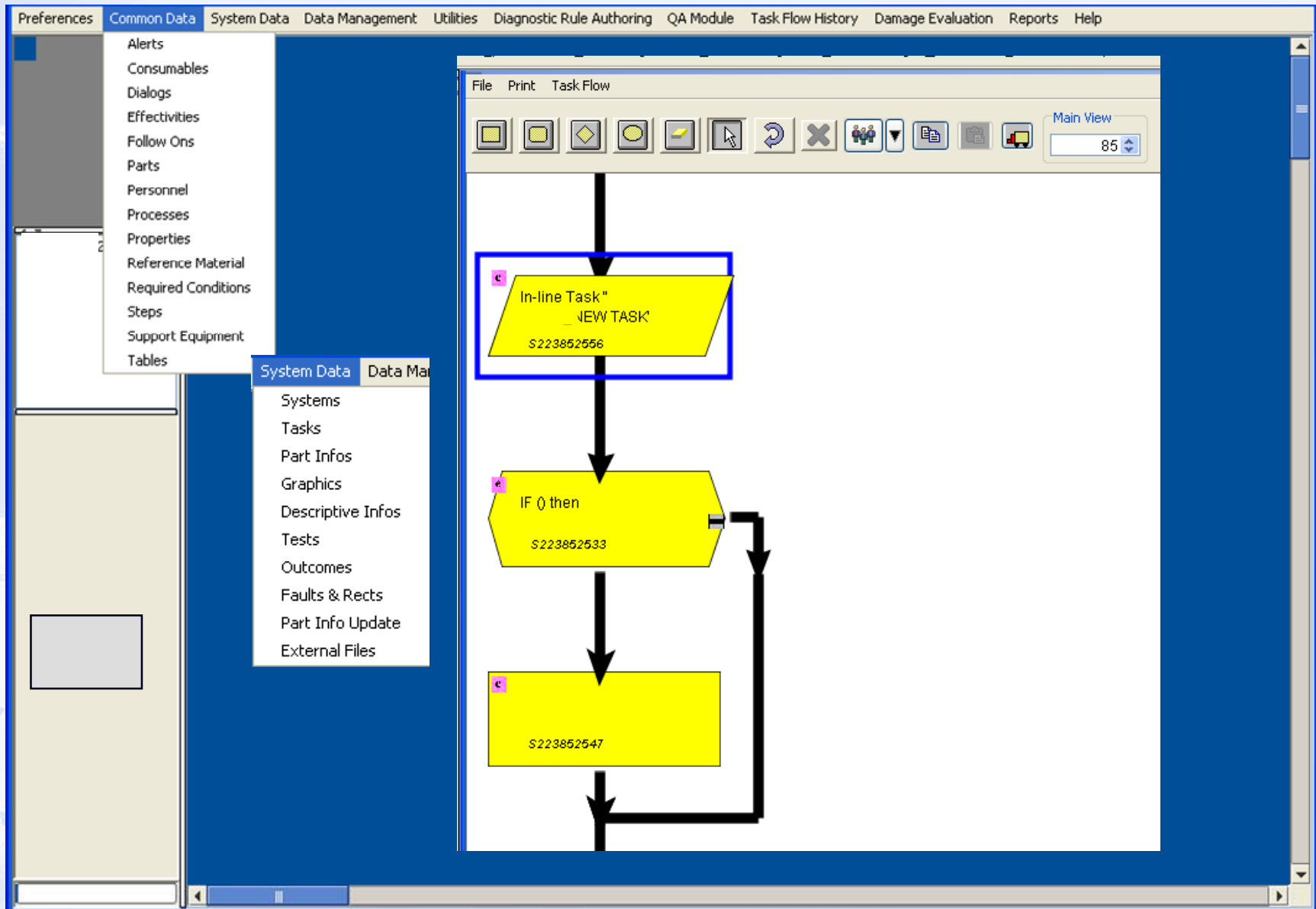
- **No “tagging” required by Writers**

- **Authoring Systems exist that require NO authoring tagging (SGML/XML)**

- **Author friendly GUI allows for content development based on authoring elements**

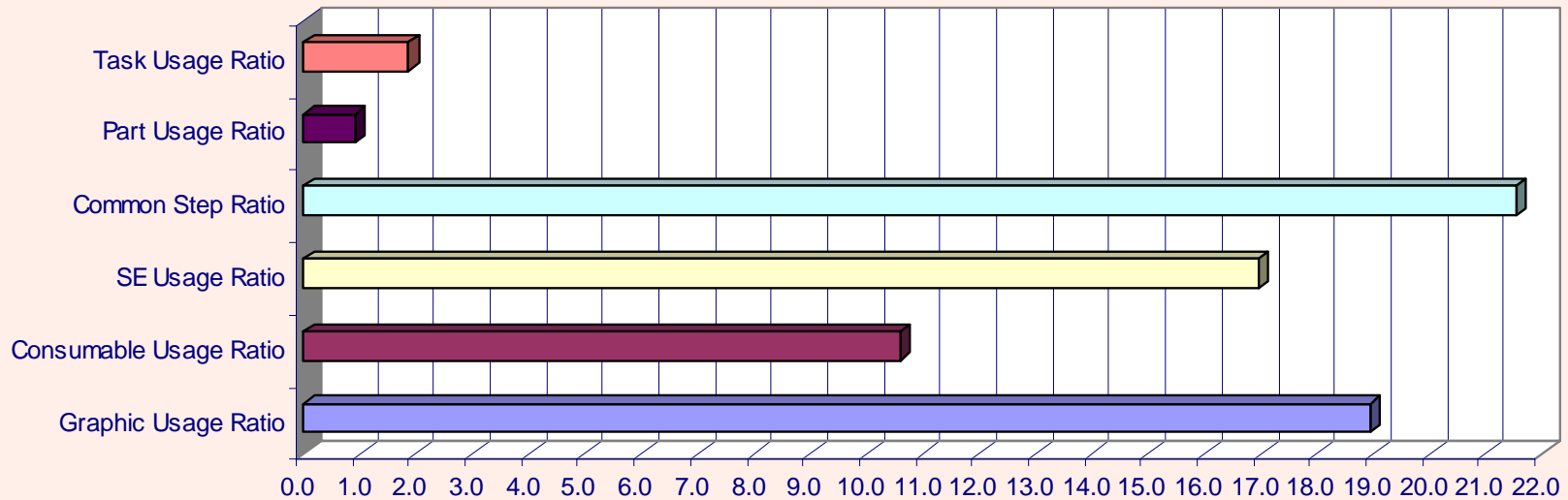
- **Authoring software tags data with appropriate information**

Authoring Tool Design



Reusability

Data Reuse Ratios on Latest IETM Delivery



■ Graphic Usage Ratio ■ Consumable Usage Ratio ■ SE Usage Ratio ■ Common Step Ratio ■ Part Usage Ratio ■ Task Usage Ratio

Total Elements: 11,853 Graphics 1057 Consumables 666 Support Equip. 3226 Common Steps 85,523 Parts 21,422 Tasks

Database Management

- **Configuration Management**
 - Work management states
 - User groups (work groups)
 - Versioning of data down to step level
 - Work flow locks writers out after work is done
 - Customer coding
- **Utilities**
 - Move utility
 - Search and replace
 - Search by SGML ID
 - Co-location authoring



Contractor Lessons Learned

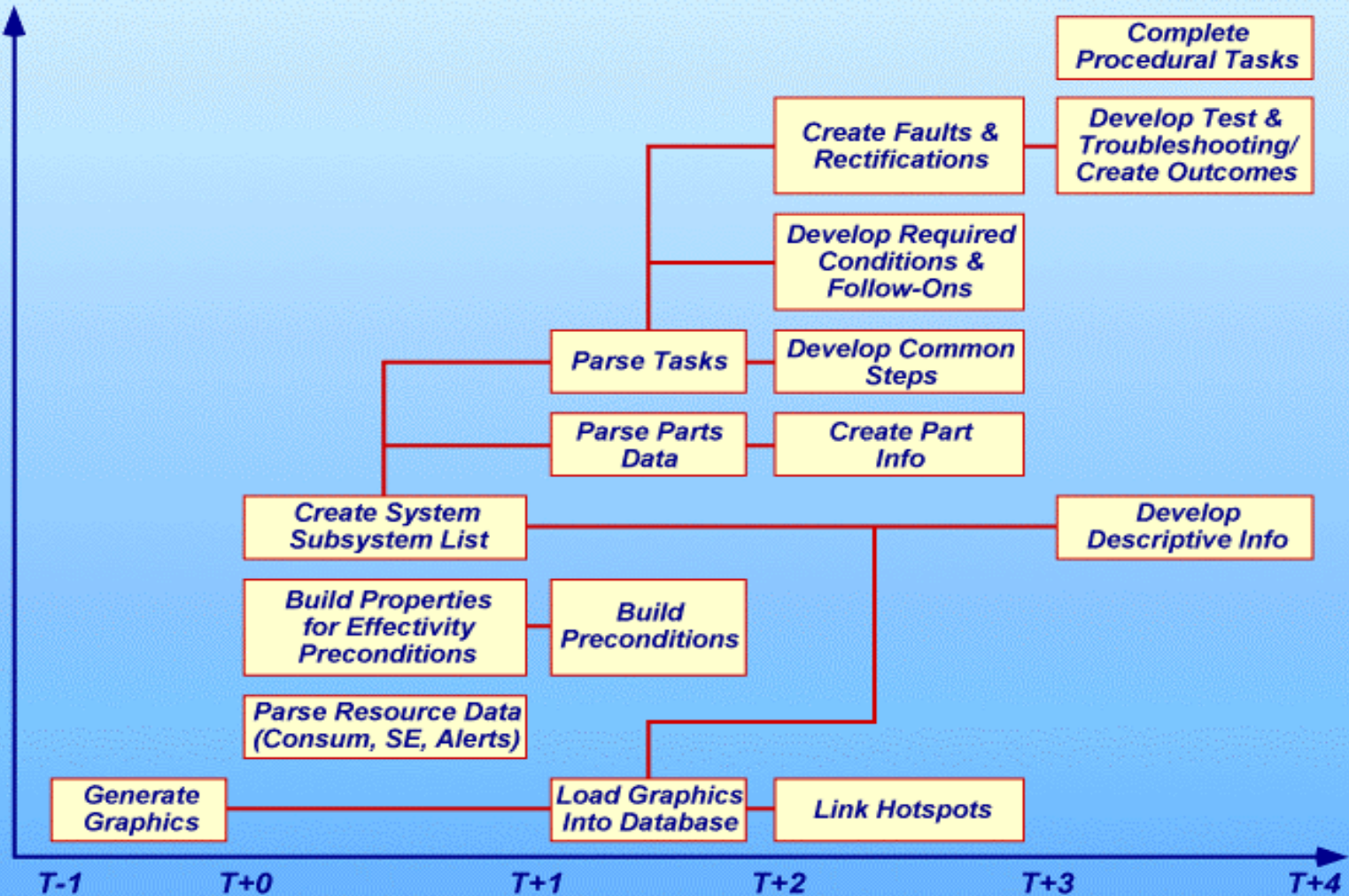
Organization

- **Roles and Privileges**
 - **Data Coordinator**
 - Overseer of the database
 - **Illustration Coordinator(s)**
 - Enforce graphic reuse
 - **IT Coordinator**
 - DBA and packaging
 - **Authors**
 - **Specialists**
 - First line quality check
 - **QA Reviewers**
 - **Authoring Groups**
 - **Common Data Control**

Planning

- **Create/Accept Estimating Methodology**
 - Can be paper based IF conversion
 - Task-based if new program
- **Training**
 - Technical writers, illustrators & management
 - (Not every writer can do this choose students wisely)
 - Engineering & manufacturing
 - Training organization
- **Data Analysis and “Staging”**
 - Setting up the common data upfront
- **Plan and Develop Versioning Techniques Early**
 - Assists in “Backing Out” errors
 - Configuration management

IETM Authoring Process Timeline



MDTSS 98 072-018

Documentation

- **Create Process Documentation**
 - Work flow
 - Metrics
- **Style and Format Documentation**
 - Style guide prevents “Innovative” authoring
 - Data validation software assists in enforcement of style
- **Requirements Definition**
 - Coordinate functionality matrix requirements with customer
 - Include the customer in this planning (by-in)
 - Identify utilities
 - Importing software
 - Metric reporting



Customer Lessons Learned

Customer – Planning

- **Develop a Business Case to Justify IETP**
 - Include life cycle cost analysis
 - Benefits analysis
- **Determine Funding Source**
 - Standard tech data funding
 - Procurement
 - Sustainment
- **Document Requirements**
 - Functionality matrix
 - This a contractor and customer coordination and agreement effort (EARLY)
 - CONOPS

Customer - Involvement

- **Create/Accept Estimating Methodology**
 - Paper based initially
 - Task-based after initial delivery (Sustainment)
- **Get End-User Involved Early**
 - In-process reviews
 - Functionality requirements
 - Verification
- **Display Hardware Procurement**
 - Identify quantity and replenishment strategy
 - eTools (laptops) and servers
 - Identify any certification or licensing issues
 - Identify funding

Lessons Learned - Customer

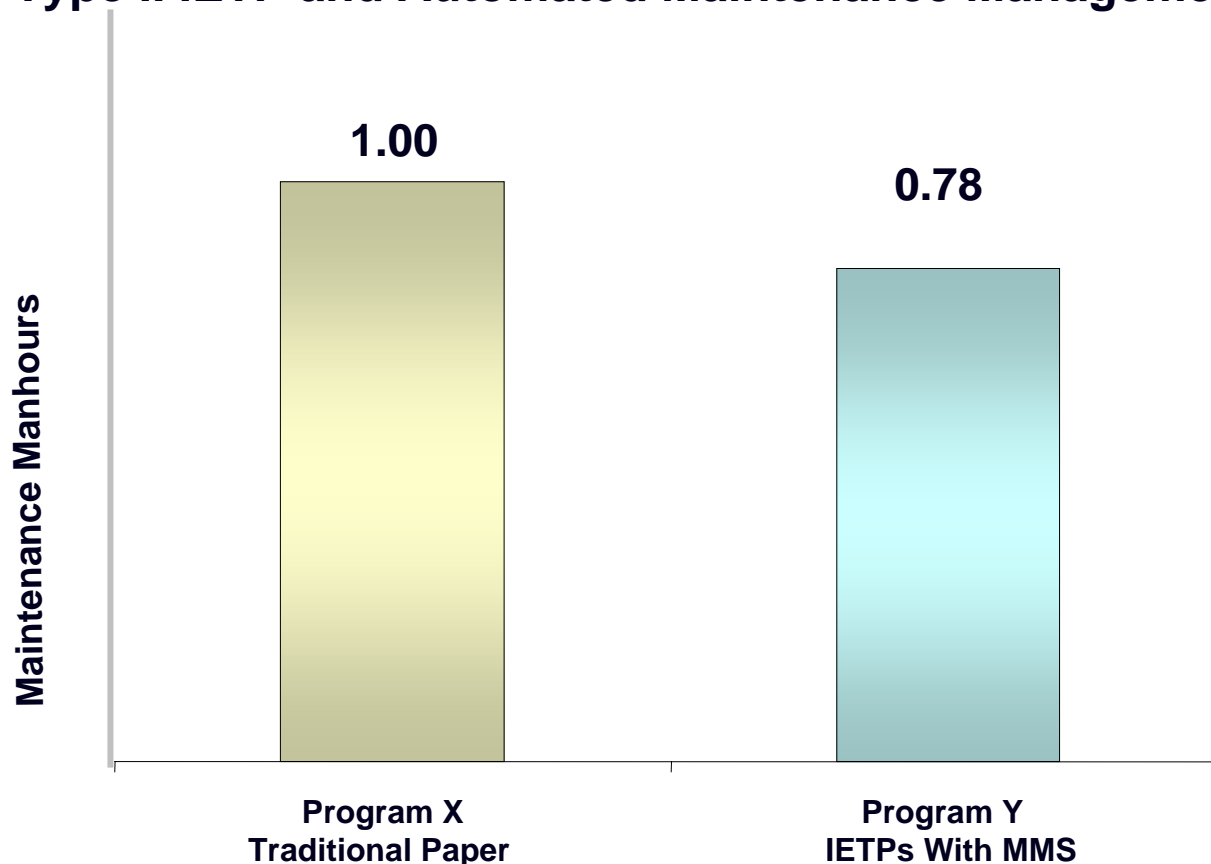
- **Availability & Capability of Needed IT Infrastructure**
 - Interface with diagnostics or weapon system?
 - Interface with maintenance management system?
- **Training**
 - End user
 - Management (All Levels)
 - Engineering
 - Training organization

Customer Cost Benefits

- **Reduced Initial Development Costs vs. Paper Development (If IETP is new)**
 - Graphics reuse
 - Data R=reuse (Parts, Common Procedures, etc.)
- **Reduced Sustainment After Delivery**
 - Graphics reuse
 - Reuse of exist tasks
 - Modification at the lowest level (Steps, Parts, etc.)
- **Reduced Training**

Savings Realized in the Field

22 % Reduction in Maintenance Manhours Due to Type II IETP and Automated Maintenance Management System

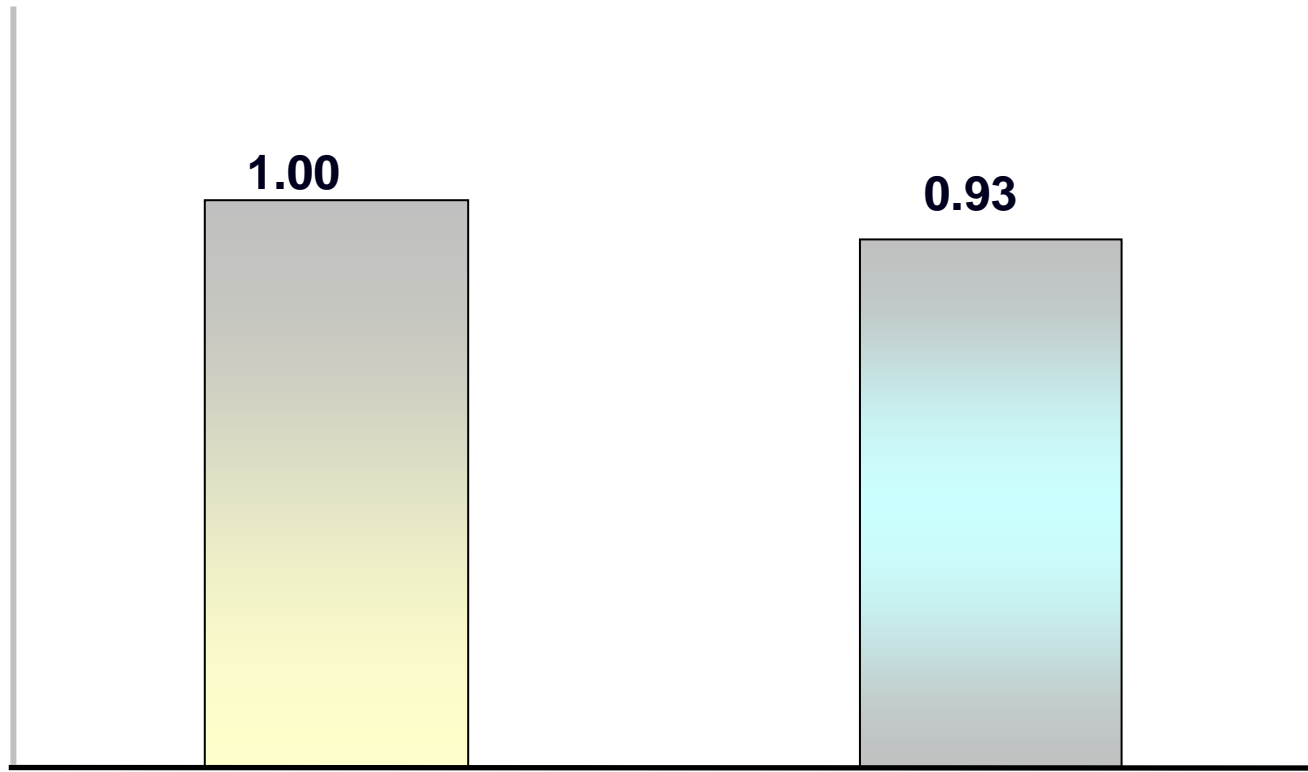


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Data Development Cost Savings

7 % Reduction in Initial Technical Data Development due to Type II IETP Authoring For all Organizational Level Maintenance Tasks

Initial Technical Data Authoring Costs

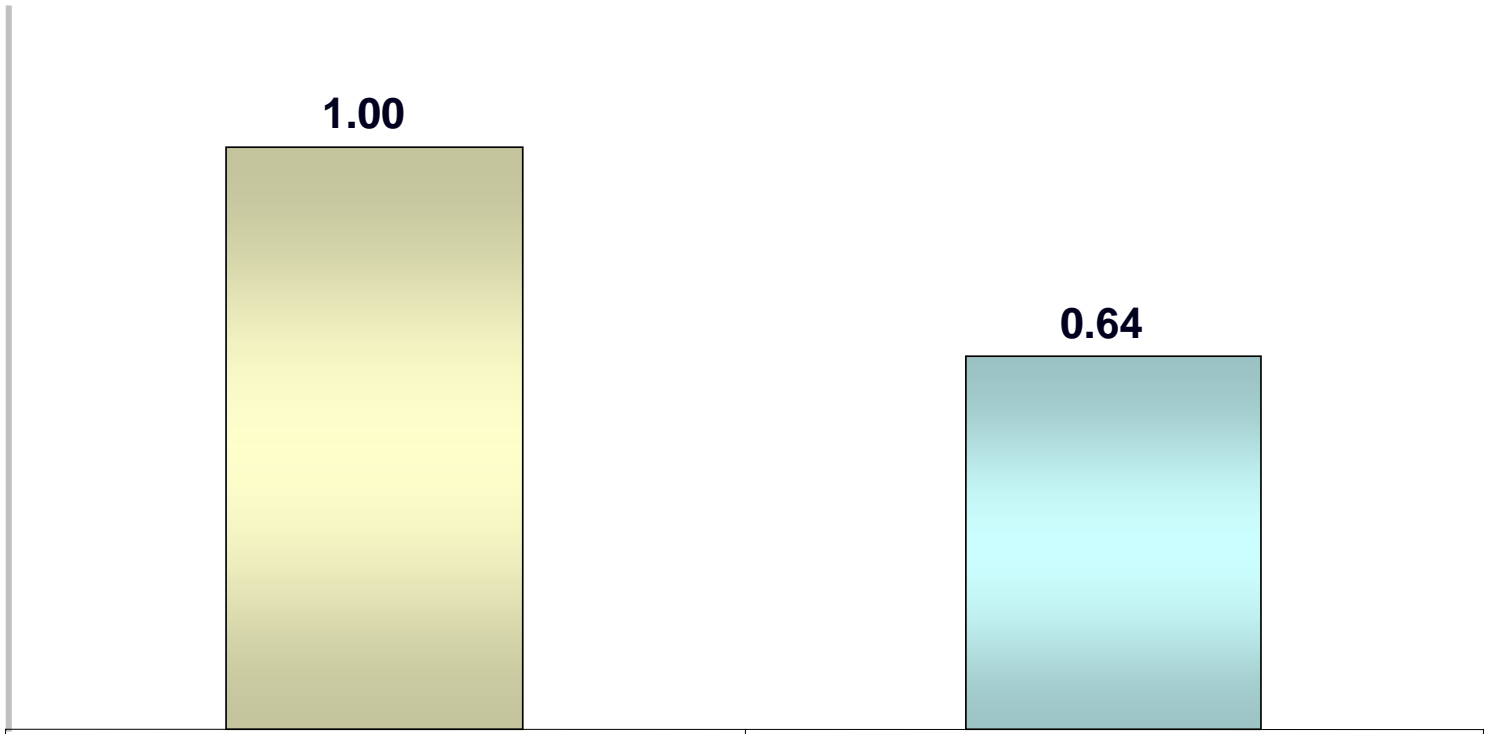


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Data Sustainment Cost Savings

36% Reduction in Sustainment Authoring Costs of Technical Data due to Type II IETP Authoring (Average costs over 3 years after initial release)

↓
Good
Sustaining Publication Costs



Conversion Lessons Learned

Conversion from Paper Format to IETPs

- **Additional Planning is required upfront**
 - Identify text vs. graphics totals in target conversion library
 - Eliminate frontal matter and TOCs in estimates to convert
 - Identification of common data
- **Conversion Does Bring A Non-Recurring Cost**
 - Business case should determine go-ahead
 - Life cycle cost analysis should identify ROI
 - Benefits are in the “Out Years” of the life cycle
- **Page Based Estimating Methodology**
 - XX pages = a single task
 - Move to task based estimating after parametric numbers gathered



Happenings Along the Way

Happenings Along the Way

- **Add-ons Provided Numerous Process Improvements**
 - Auto-sync Part utility between tech data authoring and LSA part authoring databases
 - Work flow management software to enforce work flow and lockout
 - QA module the provides quality check documentation (electronic forms) and management metric reports
 - Estimating and Scheduling module automates the processes

Happenings Along the Way

- **External Application Requirements (Linking capabilities outside the IETP)**
 - Damage evaluation and repair
 - Wiring diagrams viewer
 - Multimedia linking
 - PDF linking
 - Scheduled maintenance planning
 - Engineer disposition forms

Happenings Along the Way

- **Multiple Customers for a Project**
 - Created “Releasability” issues
 - Created requirement for “Customer Coding” to allow the continuation of reusability in the database
- **Translation of Data to Foreign Language**
 - Easiest - Translation at the export prior to viewer import is most efficient
 - More labor intensive - Authoring in multiple languages increases database size
 - Requirements for Simplified English assist in the translation

Happenings Along the Way

- **IETP Requirements Added to S1000D**
 - Provided the chance to enhance the IETP functionality
- **S1000D IETP Requirements becoming Contract Requirements**
 - Requires existing and new authoring and viewing systems to provide S1000D and 87269 capabilities
 - Requires industry to take a closer look at S1000D (S1000D was developed by industry with government oversight)
 - Previous specification (87269) was developed by government for industry use

Conclusion

IETPs

- Enable a host of information exchange opportunities
- Provide greater visibility and accuracy in the target maintenance environment
- Enforce process and resolution to enable trend analysis for better product yield analysis

Through careful planning and understanding of the technology, IETPs can enable a host of information exchange opportunities.

The standards are being updated to include IETP functionality (S1000D)

Understanding the capabilities is the challenge!

Questions?