The Future of Requirements Exchange
The future of Requirements Exchange

Global Product Data Interoperability Summit | 2016

• Agenda
  • Current Methods of Requirement Exchange
    – Document Authoring
    – Database Authoring
    – Associated Costs
  • Future Method of Requirement Exchange
    – Web enabled Single Source
    – Integrated package of all elements
    – Associated Benefits
The future of Requirements Exchange

Global Product Data Interoperability Summit | 2016

• Current Methods – Document Based authoring and distribution
  • Requirements Management focused, verification methods and deliverables manually associated to requirements
  • MSWord, Adobe PDF, Drawings, Associated Files
  • Separately managed activities for validation, allocation and verification
  • Documents distributed to supplier
  • Reuse consists of uncontrolled copy paste
  • Metrics almost non-existent
The future of Requirements Exchange

• Current Methods – Database authoring and distribution
  • Requirements Management focused, verification methods and deliverables weakly associated to requirements
  • Separately managed activities for validation and allocation
  • Database extracts distributed (or documents created and distributed)
  • Reuse is limited and complicated
  • Metrics are focused on performance to schedule
The future of Requirements Exchange

Current Methods – Cost Impacts
- Quality of Requirements are costly

Causes of cost growth impacts from requirements:
- Requirement Revisions
- Design Gaps
- Build Errors
- Test Failures
- In-Service Problems
The future of Requirements Exchange

Global Product Data Interoperability Summit | 2016

• Future Requirements eXchange
  • Web enabled data base infrastructure
    – Object Oriented Requirements Database
    – Associated Files, CAD Models, ICDs, Envelope Models, other supporting files
    – Product design offload is not limited to requirements focus
    – Metrics can be focused to benefit user role (i.e. Author, Manager, Program…)
    – Ability to co-author with suppliers in a shared work space
  • Single Source Repository
    – OEM and supplier are accessing the same data source concurrently
  • AP239 and ReqIF compliant
The future of Requirements Exchange

- Future Package Management
  - Create and Reuse Structured Requirements and relationships
    - Collaborative Supplier Access Requirements Development
  - Apply Development Assurance Industry Practices
    - Requirement Verification Planning (i.e. Testing, Analysis, Similarity)
    - Deliverables Planning and Identification
    - Requirement Allocation to Objectives
    - Requirement Validation
    - Identification of Safety Requirements
Future Package Integration

- Requirement Sets
  - Requirement
    - Notes
    - Rationale
    - Guidance
  - Verification
    - Notes
    - Rationale
    - Guidance
  - Deliverable
    - Notes
    - Rationale
    - Guidance
- Allocation
- Behavior
- Attachments
- Functional Organizations
- Supplier Verification
- List of Deliverables
  - Plans
  - Procedures
  - Reports
- Supplier Part Numbers
- Reqmts Outline
The future of Requirements Exchange

• Future Package Management
  – Stakeholder and Approver Review and Comment
  – Use of relationships to Identify Stakeholders and focus review efforts
  – Manage Resolution of comments to improve first time quality
The future of Requirements Exchange

Global Product Data Interoperability Summit | 2016

• Future Package Management
  – Procurement Integration and Supplier Assignment
  – Supplier Access
    ➢ Direct supplier interaction with requirements Package
    ➢ Supplier Acceptance
    ➢ OEM Supplier Interaction
  – Supplier Verification Evidence
    ➢ Schedule and List of Deliverables
  – Supplier Data Submittal
  – Compliance
  – Deviation Management
The future of Requirements Exchange

- Future Package - Single Source of Data

Virtual shared work space

- Requirement Provider
- Business Partner
- OEM Supplier
- Engineering
- Procurement Agent
The future of Requirements Exchange

Global Product Data Interoperability Summit | 2016

• Opportunities presented with a Web based integration of Requirements Packaging
  – Reuse
    – Improves requirement Quality
    – Reduces effort for creation and review
    – Takes advantage of previous work
    – Provides consistency to supplier
  – Advanced Analytics Available
    – Ability to use metrics to assist the user in creating quality requirements, relationships and package
    – Availability of customized group and program metrics and reporting
The future of Requirements Exchange

Global Product Data Interoperability Summit | 2016

• Opportunities presented with a Web based integration of Requirements Packaging
  – Product Reliability & Maintainability
  – Object Oriented Requirements Data
  – expanded capability of industry tools
  – Improved requirement quality
• Future Methods – Cost Avoidance
  • Requirements delivered at a much higher quality avoiding costly errors found later
The future of Requirements Exchange

Global Product Data Interoperability Summit | 2016

- Enables Model Based Systems Engineering

Life Cycle Tasks (continuous)
- Define Requirements Packaging
  - Decomposition, Allocation, Development
- Simulation / Analysis
- Configuration Management / Model Maturity

Design Architecture Develop Phase
- Regulatory Operational Market Specific Performance Environmental Design Suitability Verification
- System Behavior (Intent, State) Energy Sources Communications, Signaling Operational Services
- ICD Wire Design Loadable SW Network Config Subsystem Integration
- Schematics Component IDs Physical Characteristics

Life Cycle
- Requirements
- Functional Architecture
- Logical Architecture
- Logical BOM Specifications

Deliverables
- Design, Verification, Validation Activities
The future of Requirements Exchange

Global Product Data Interoperability Summit | 2016

• Contacts

• Neil Lichty - neil.k.lichty@boeing.com

• David Patterson – david.w.patterson@boeing.com