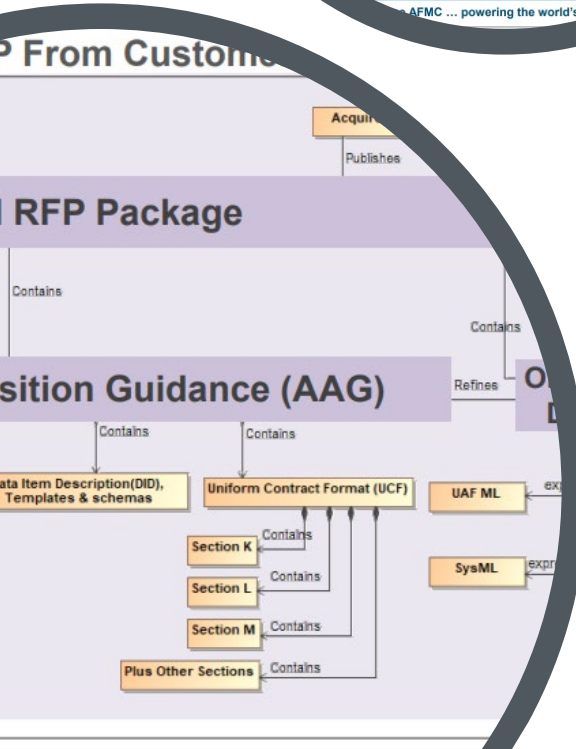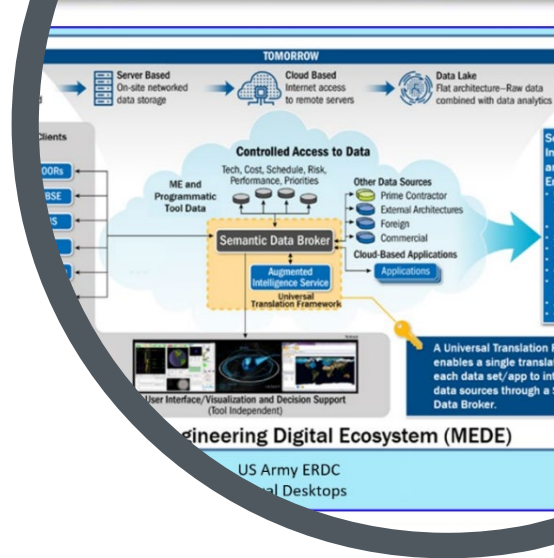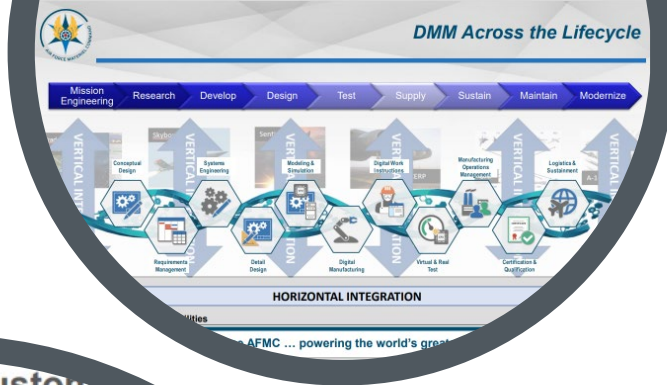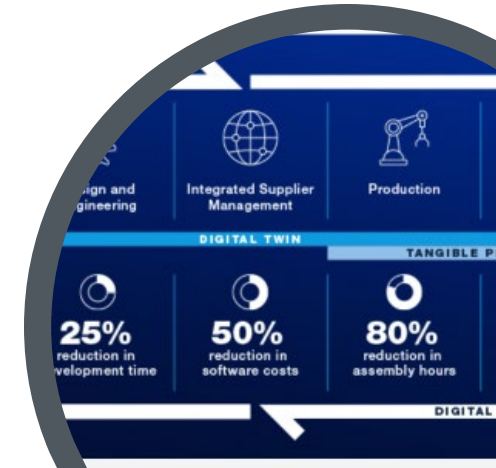# Fitting Digital Standards in Tomorrow's Digital Ecosystems

Leslie McKay, SAE International

July 2024

Everyone is Talking About Digital Engineering

Challenges with Product Development and Supply Chain Processes Today

Mobility, Advanced™

Risk to Quality
- Transcription errors
- Manual extraction of numerical/textual data

Increased Cost
- Hard to find standard parts
- Increased costs due to low-volume orders
- Increased material costs and redundancy

Lack of Integration
- Many legacy systems, especially in companies with high acquisition strategies
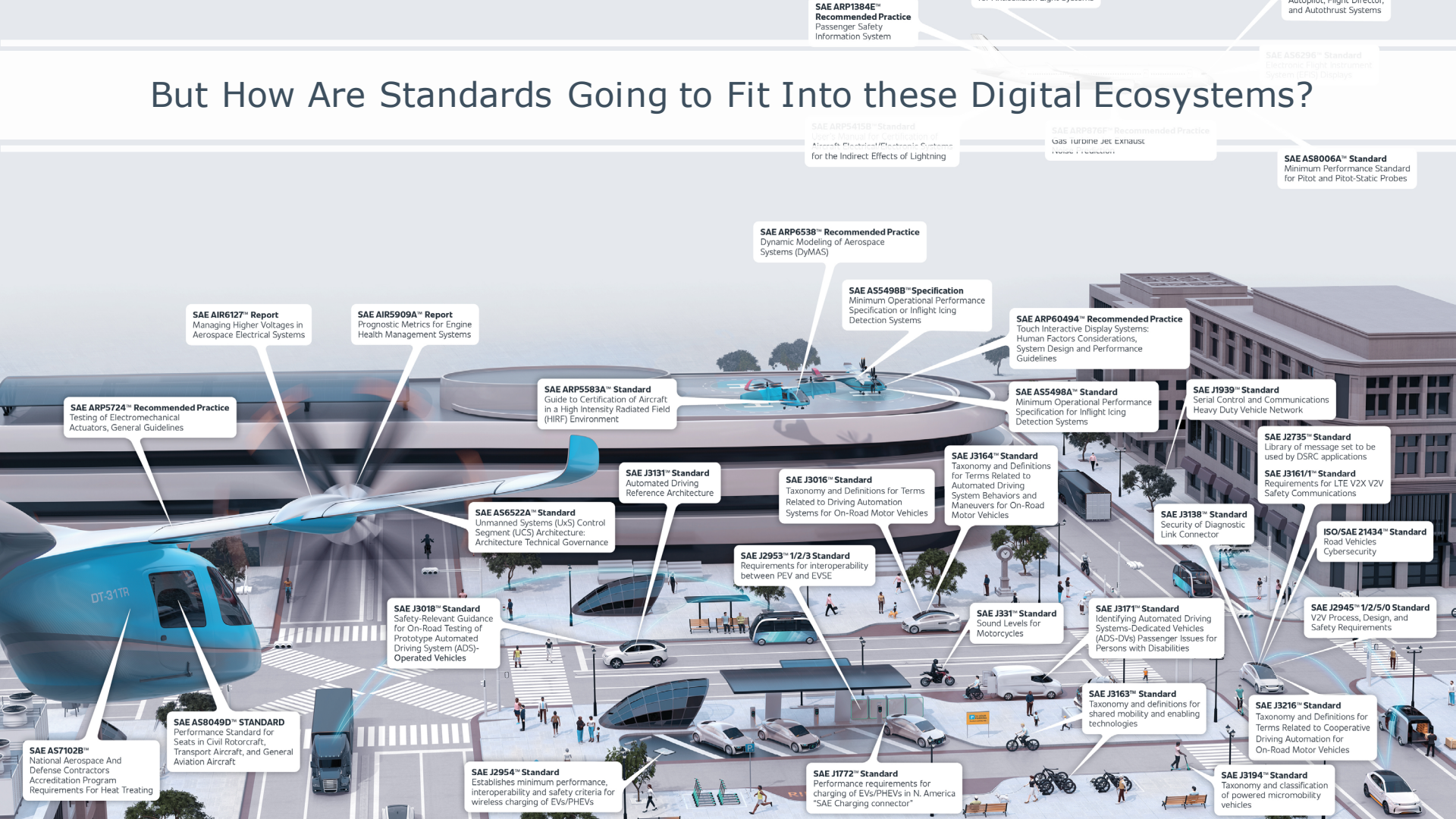- Little to no data migration/sharing between systems

Workflow Inefficiencies
- Lots of rework to pull in standards data to multiple systems
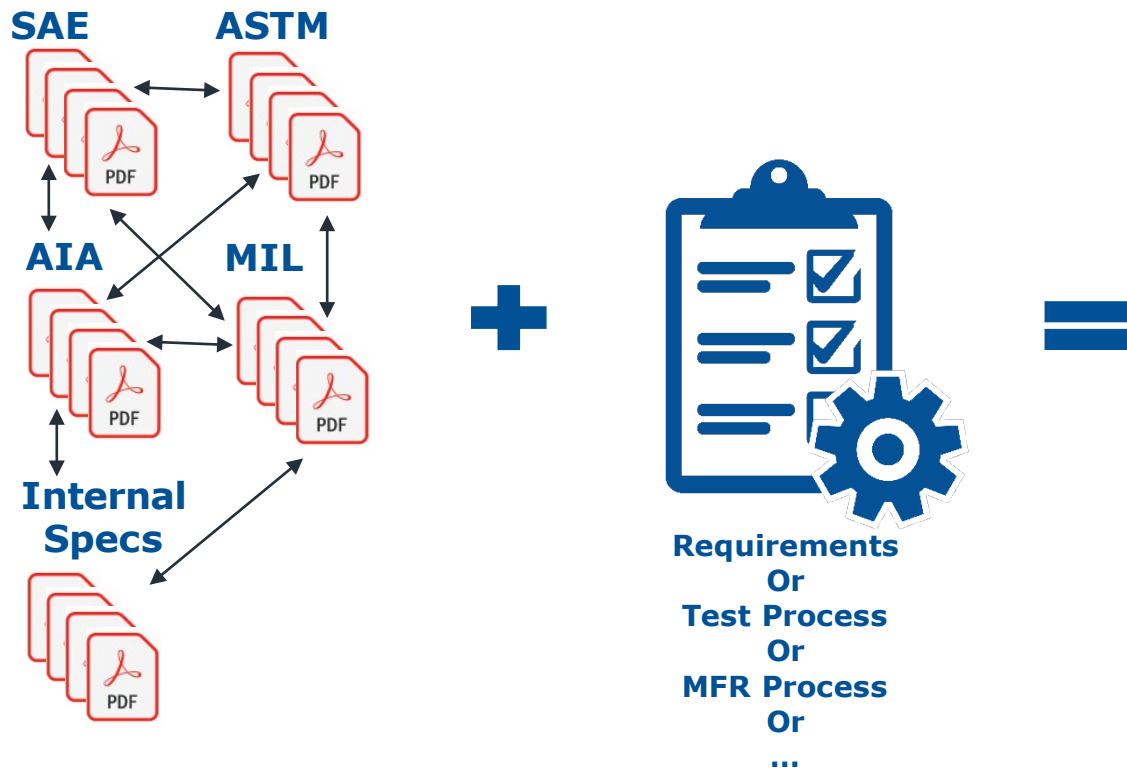- Lack of data normalization

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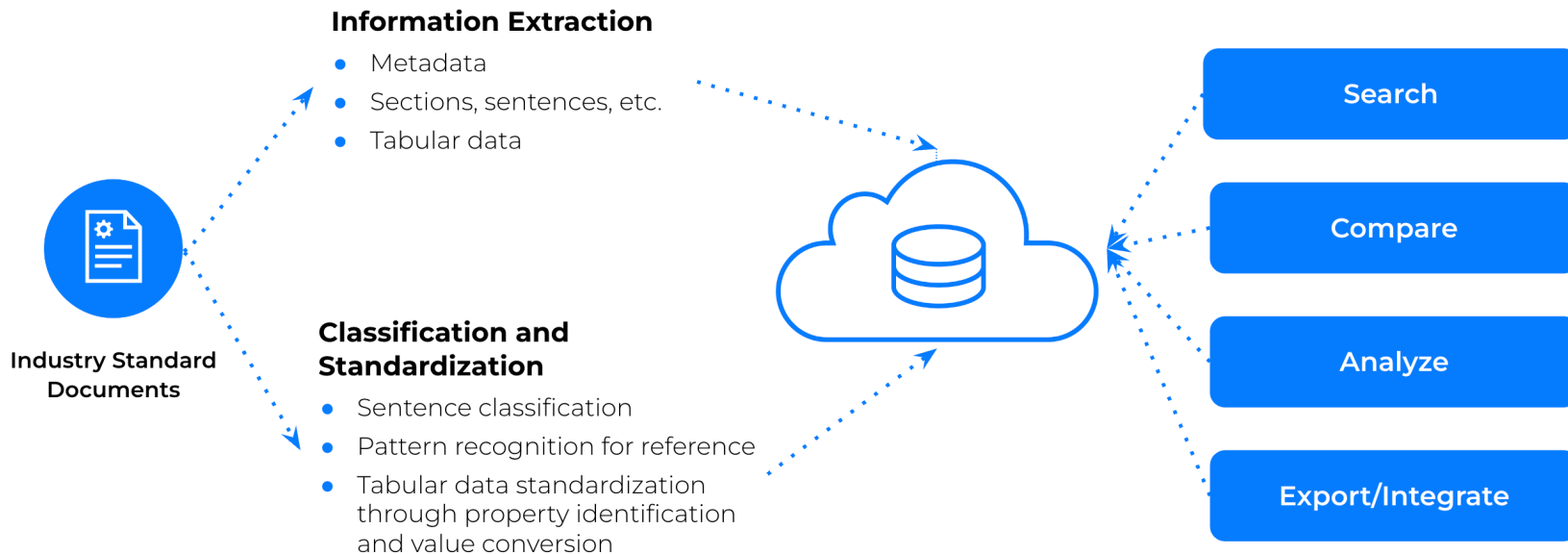
But How Are Standards Going to Fit Into these Digital Ecosystems?

SAE ARP1384E™ Recommended Practice
Passenger Safety Information System

SAE AS6296™ Standard
Electronic Flight Instrument System Displays

SAE ARP5415B™ Standard
Users Manual for Certification of Aircraft Electrical/Electronic Systems for the Indirect Effects of Lightning

SAE ARP876F™ Recommended Practice
Gas Turbine Jet Exhaust Noise Prediction

SAE AS8006A™ Standard
Minimum Performance Standard for Pitot and Pitot-Static Probes

SAE ARP6538™ Recommended Practice
Dynamic Modeling of Aerospace Systems (DyMAS)

SAE AS5498B™ Specification
Minimum Operational Performance Specification or Inflight Icing Detection Systems

SAE ARP60494™ Recommended Practice
Touch Interactive Display Systems: Human Factors Considerations, System Design and Performance Guidelines

SAE AIR6127™ Report
Managing Higher Voltages in Aerospace Electrical Systems

SAE AIR5909A™ Report
Prognostic Metrics for Engine Health Management Systems

SAE AS5498A™ Standard
Minimum Operational Performance Specification for Inflight Icing Detection Systems

SAE J1939™ Standard
Serial Control and Communications Heavy Duty Vehicle Network

SAE ARP5724™ Recommended Practice
Testing of Electromechanical Actuators, General Guidelines

SAE ARP5583A™ Standard
Guide to Certification of Aircraft in a High Intensity Radiated Field (HIRF) Environment

SAE J2735™ Standard
Library of message set to be used by DSRC applications

SAE J3161/1™ Standard
Requirements for LTE V2X V2V Safety Communications

SAE J3131™ Standard
Automated Driving Reference Architecture

SAE J3016™ Standard
Taxonomy and Definitions for Terms Related to Driving Automation Systems for On-Road Motor Vehicles

SAE J3164™ Standard
Taxonomy and Definitions for Terms Related to Automated Driving System Behaviors and Maneuvers for On-Road Motor Vehicles

SAE J3138™ Standard
Security of Diagnostic Link Connector

SAE AS6522A™ Standard
Unmanned Systems (UxS) Control Segment (UCS) Architecture: Architecture Technical Governance

ISO/SAE 21434™ Standard
Road Vehicles Cybersecurity

SAE J2953™ 1/2/3 Standard
Requirements for interoperability between PEV and EVSE

SAE J3018™ Standard
Safety-Relevant Guidance for On-Road Testing of Prototype Automated Driving System (ADS)-Operated Vehicles

SAE J331™ Standard
Sound Levels for Motorcycles

SAE J3171™ Standard
Identifying Automated Driving Systems-Dedicated Vehicles (ADS-DVs) Passenger Issues for Persons with Disabilities

SAE J2945™ 1/2/5/0 Standard
V2V Process, Design, and Safety Requirements

SAE AS8049D™ STANDARD
Performance Standard for Seats in Civil Rotorcraft, Transport Aircraft, and General Aviation Aircraft

SAE J3163™ Standard
Taxonomy and definitions for shared mobility and enabling technologies

SAE J3216™ Standard
Taxonomy and Definitions for Terms Related to Cooperative Driving Automation for On-Road Motor Vehicles

SAE AS7102B™
National Aerospace And Defense Contractors Accreditation Program Requirements For Heat Treating

SAE J2954™ Standard
Establishes minimum performance, interoperability and safety criteria for wireless charging of EVs/PHEVs

SAE J1772™ Standard
Performance requirements for charging of EVs/PHEVs in N. America "SAE Charging connector"

SAE J3194™ Standard
Taxonomy and classification of powered micromobility vehicles

DT-31TR

Interoperability Across Digital Standards Will Be Critical

Mobility, Advanced™

SAE **ASTM**

AIA **MIL**

Internal Specs

+

Requirements
Or
Test Process
Or
MFR Process
Or
…

=

SAE's Digitization Approach

Industry Standard Documents

Information Extraction
- Metadata
- Sections, sentences, etc.
- Tabular data

Classification and Standardization
- Sentence classification
- Pattern recognition for reference
- Tabular data standardization through property identification and value conversion

Search

Compare

Analyze

Export/Integrate

SAE's First Attempt At Digital Standards: OnQue

Mobility, Advanced™

Dimensions

Composition

Materials Properties

Eliminate Transcription Errors

Support Systems Integration

Maximize Re-Use

Lower Costs

Minimize Change Management

Digitally Track Requirements

Lessons Learned

- Requirements Identification

- Data Normalization

- List Handling

- Information Classification

SDOs Have Traditionally Been Publishers

- Some SDOs only provide PDFs

- Standards offered in XML are typically in schemas focused on document formatting, not data communication

- Some SDOs have never heard of MBSE, much less SySML

- Interoperability will be critical

- Standards need to be consumable by major PLMs—engineers do not want more tools!

Digital Standards Alliance

- Bringing together:
  - Industry
  - Government Agencies & Regulators
  - Standards Development Organizations (SDOs)

- Provide More Direction from Government and Industry About Digital Standards

Digital Standards Alliance

Influences the standardization and conformance industry in transforming multiple types of standards, creating efficiencies throughout the digital thread used in the design, manufacture, and support of the next generation of industry

Accelerate Standards Data Integration

Promulgation of digital standards of interest to be used in the entire product lifecycle.

Best Practices and Education

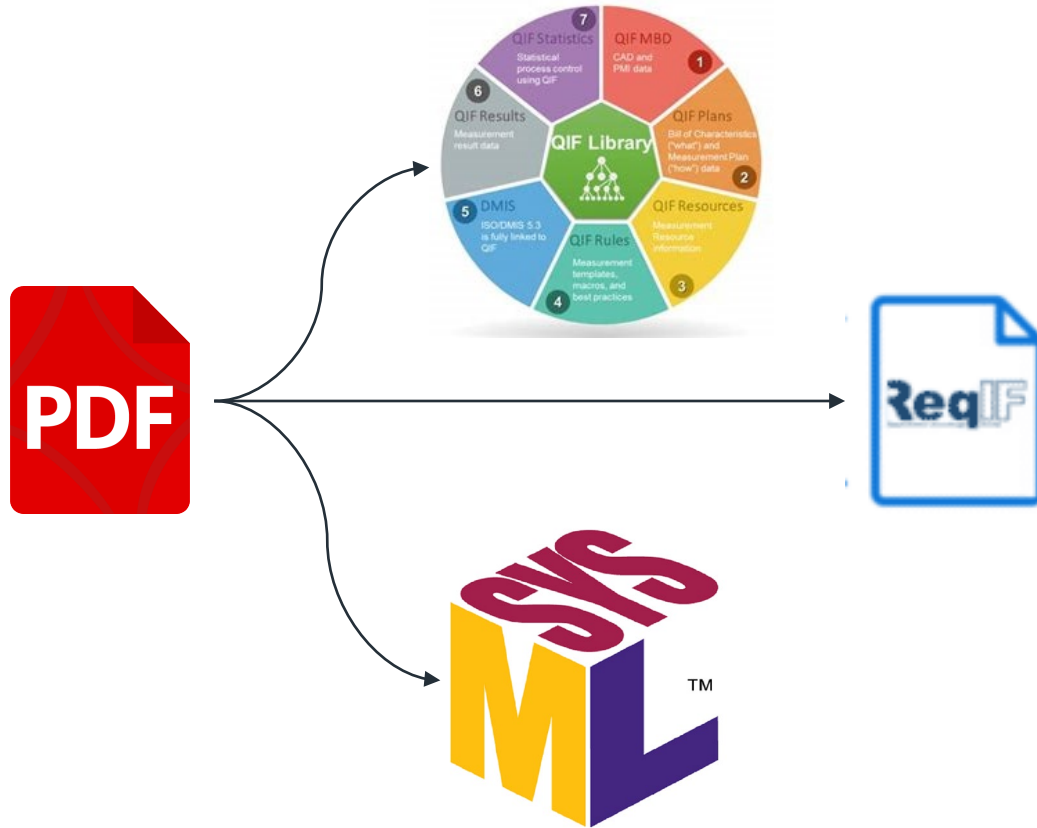Best practices for authoring and converting legacy standards into digital standards (beyond XML)

Liaison with Other Digital Initiatives

Collaborate with other initiatives and organizations to ensure interoperability of digital standards in larger ecosystems

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Join us!

Accelerate Standards Data Integration

Best Practices and Education

HOW TO WRITE DIGITAL-READY STANDARDS

HOW TO CONSISTENTLY MAP INFORMATION FROM STANDARDS TO TARGET SCHEMAS/FORMATS

HOW IS VALUE BEST REALIZED FROM DIGITAL STANDARDS

Liaison with Other Digital Initiatives

Join Us!

- We want to focus on digital standards, not the entire digital ecosystem

- We want to collaborate with the other consortia focused on the larger digital ecosystems.

- You can join as a voting member or as a participant at the working group level

Questions?