



ATA Specification 2300

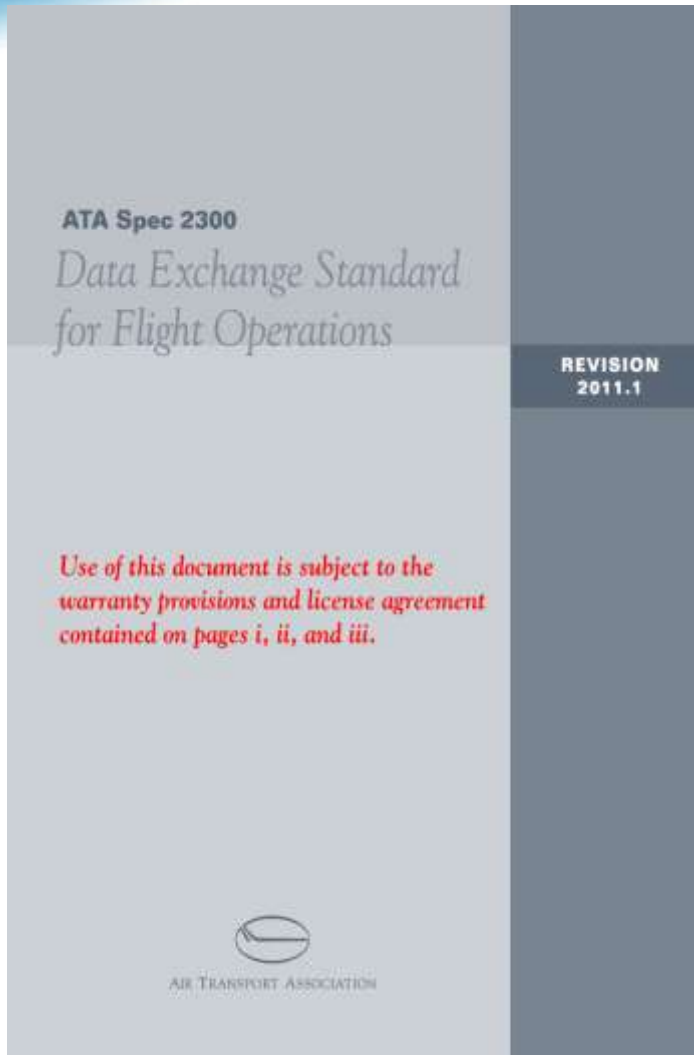
Advancing Digital Data Through a Common Specification

Bill Cunningham
Digital Data Lead Engineer
Flight Operations Support
Boeing Commercial Airplanes



6-8 June 2011
Montreal, Quebec, Canada

Agenda



- **Background Information**
- **FOIG Purpose, Objectives and Scope**
- **What Is In ATA Spec 2300?**
- **Flight Operations Markup Language**
- **Benefits**
- **Q & A**

Background Information

- **Historically every airplane maker (OEM) has developed proprietary tools and software to create and deliver flight Operations data to the airlines.**
- **Each OEM uses proprietary data structures and architecture to support their data and documents**
- **Airlines need to maintain multiple publishing systems to support mixed OEM fleets or they need to contract with expensive vendors to develop hybrid systems to managed mixed fleets**
- **Airlines are asking for data from all OEMs to conform to a single standard**



FOIG Purpose

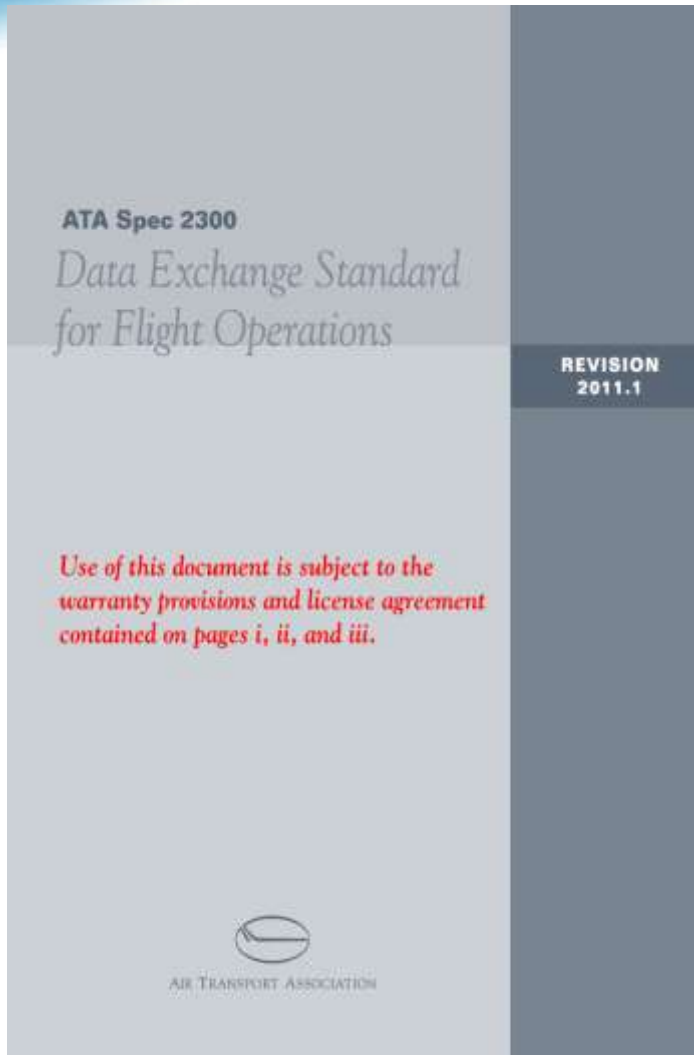
To provide a forum for exchanging ideas, discussing challenges, recommending enhancements and developing aviation industry consensus for electronic flight operational data exchange specifications

<https://www.ataebiz.org/apps/org/workgroup/foig/>

FOIG Team

- **Active team members consist of:**
 - OEM participants
 - Airlines participants
 - XML Publishing Industry Vendor participants
- **The team holds quarterly face-to-face meetings**
- **Web and phone conferences are held regularly to monitor and progress the work between face-to-face meetings**
- **Members are assigned action items to work between meetings**
- **New participants are needed and always welcome!**

Spec 2300 - Purpose



- Exchange of information based on non-proprietary standards
- A standard architecture that is data-centric as opposed to document-centric and relies on modular reusable components
- Information from multiple manufacturers is received by operators in a single consistent manner
- Facilitate identification of changes to the data
- Facilitate modification or re-authoring of information
- Separate presentation of information from the content of the information, enabling output to multiple formats
- Enable identification of information based on its applicability to specific aircraft or fleets
- Facilitate re-use of content for different audiences, e.g., Crew Use During flight, In-House Training, Engineers, computer-Based Training (CBT).

Spec 2300 Scope and History

- **Release 2009.1:**
 - Systems Description
 - Data Management
 - DM Status, Applicability Model, Revision Management
- **Release 2011.1**
 - Dispatch Data
 - Front Matter
 - Procedures
 - Publication Module
- **Future Release (2011.2)**
 - Limitations
 - Performance
 - Airplane Certification (AFM)



What is in Spec 2300

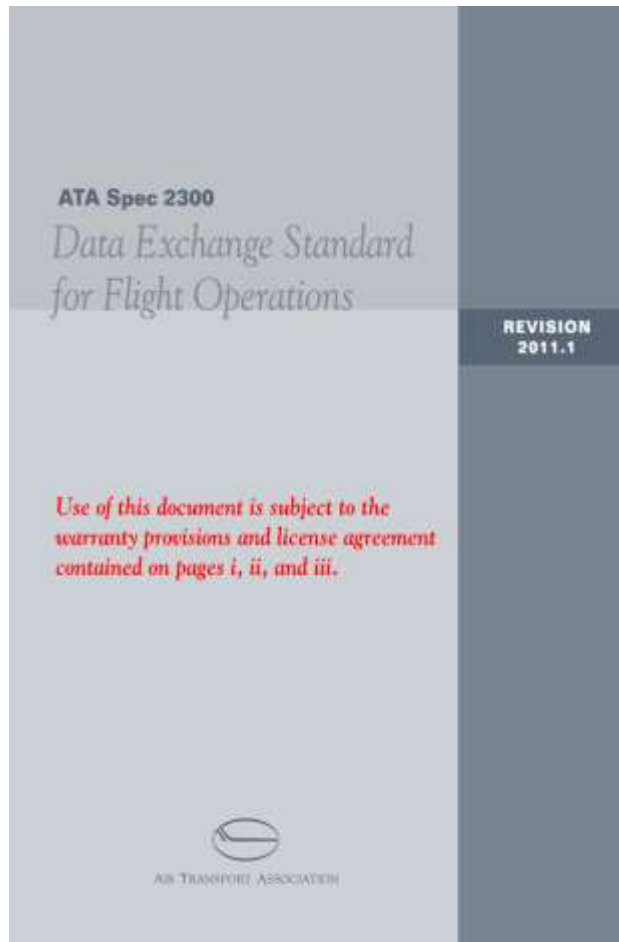


Table of Contents

CHAPTER 1. INTRODUCTION	1
1-1. Purpose.....	1
1-2. Intended Audience.....	1
1-3. Scope Of This Document.....	2
CHAPTER 2. FLIGHT OPERATIONS INFORMATION MANAGEMENT	6
2-1. Data Management Concepts.....	6
2-2. Data Module Management.....	6
2-2-1. Data module types.....	6
2-2-2. Data module identification.....	7
CHAPTER 3. INFORMATION TYPES.....	56
3-1. Systems Description.....	56
3-2. Dispatch Data.....	59
3-3. Flight Crew Procedures Data.....	62
3-4. Front Matter.....	65
CHAPTER 4. FLIGHT OPERATIONS MARKUP LANGUAGE	66
4-1. Flight Operations XML Data Structure.....	66
4-1-1. General.....	66
4-2. Common And Shared Schema Modules.....	67
4-2-1. Common Attributes.....	68
CHAPTER 5. USER GUIDE	79
5-1. General Guidelines.....	79
5-1-1. Document Organization.....	79
5-2. Common Objects.....	80
1. Content Guidelines.....	80
CHAPTER 6. APPENDICES	126
6-1. Flight Operations Information Standards.....	126
6-1-1. Phase Of Flight Specification.....	126
1. Identification.....	126
2. Transition Relationships.....	126
3. Definitions.....	128
6-2. ATA Flight Operations Standard Numbering System.....	133
6-3. References.....	157
6-4. Sample XML.....	158

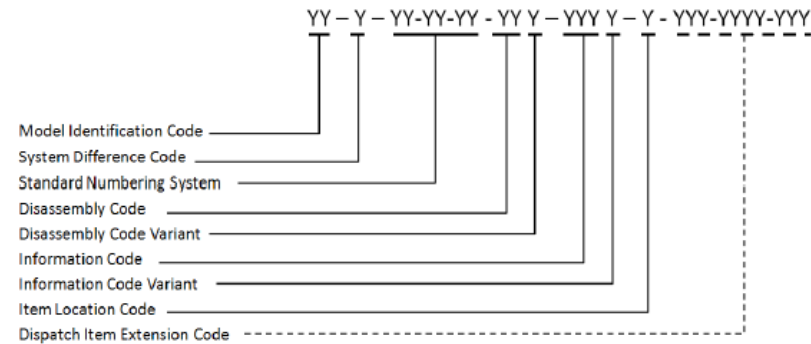
What Does ATA Spec 2300 Data-Centric Mean?

- **Spec 2300 is more than just a Data Exchange Standard!**
- **Data-Centric approach, focuses on defining data objects, known as data modules that represent a unique piece of technical content.**
- **Each data module is specifically defined not only for its precise structure, but also for its relationship to other data modules**
- **Each data module is identified with a Data Module Code which follows the Standard Numbering System. Phase of Flight can be assigned where applicable**
- **Instead of one XML Schema for the FCOM or MMEL, the schema team has defined a series of schemas for different data types within the FCOM, MMEL and other related documents**
- **Spec 2300 allows the exchange of the data modules and their metadata to enable the OEMs or airline operators to build their own products whenever they want**
- **Preserve the longevity of the data as technology changes!**

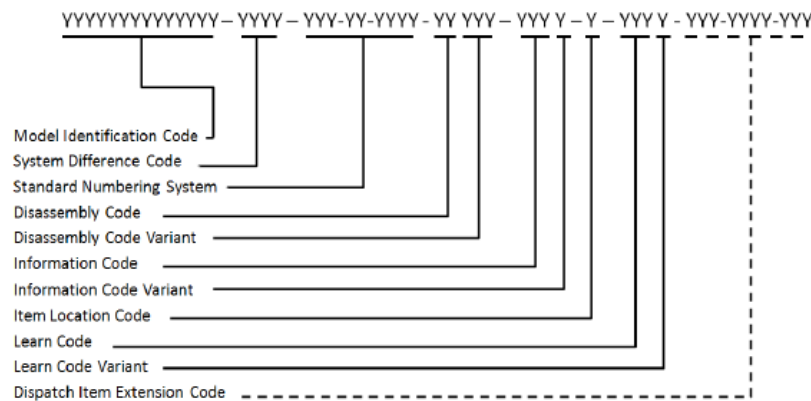
Spec 2300 Data Management - Data Module Code

- The Data Module Code is the standardized and structured identifier for a data module.
- Uses the same DMC structure as S1000D
- Adds a 10 digital Dispatch Item Extension

DMC 17+10 Characters



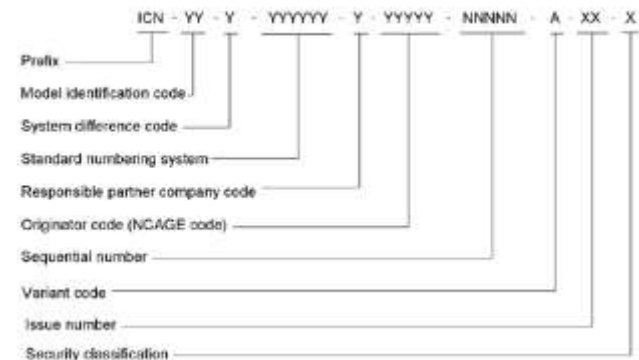
DMC 41+10 Characters



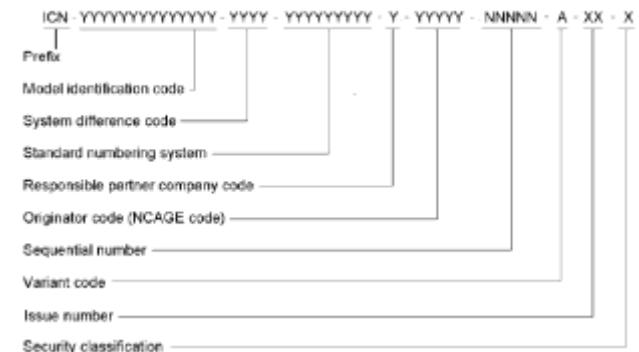
Spec 2300 Data Management – Information Control Number

- The Information Control Number is the standardized and structured identifier for an illustration, graphic or multimedia file.
- Uses the same ICN structure as S1000D

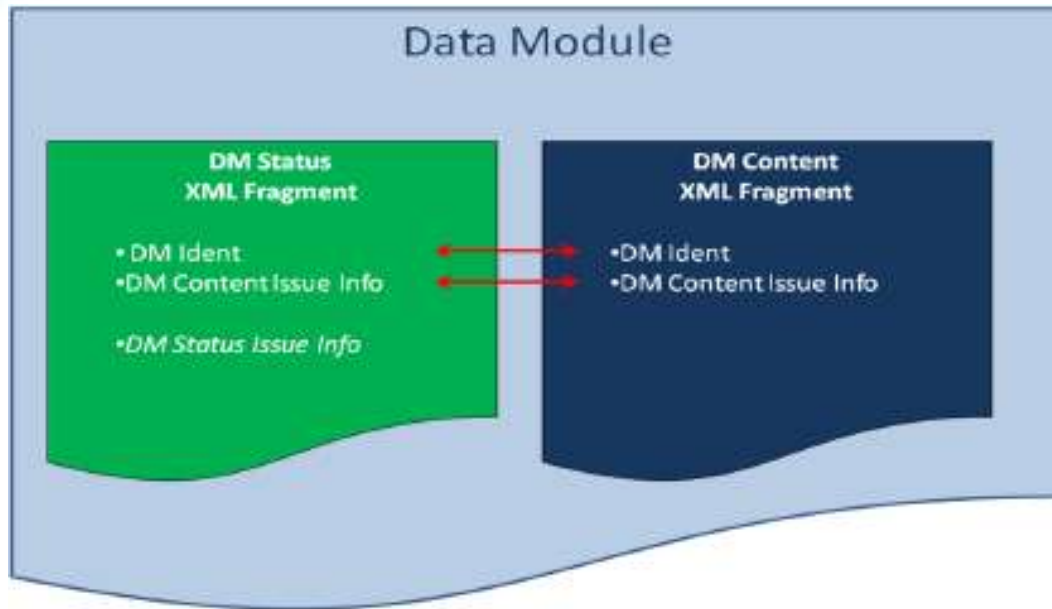
Information control number - min 27 characters:



Information control number - max 45 characters:



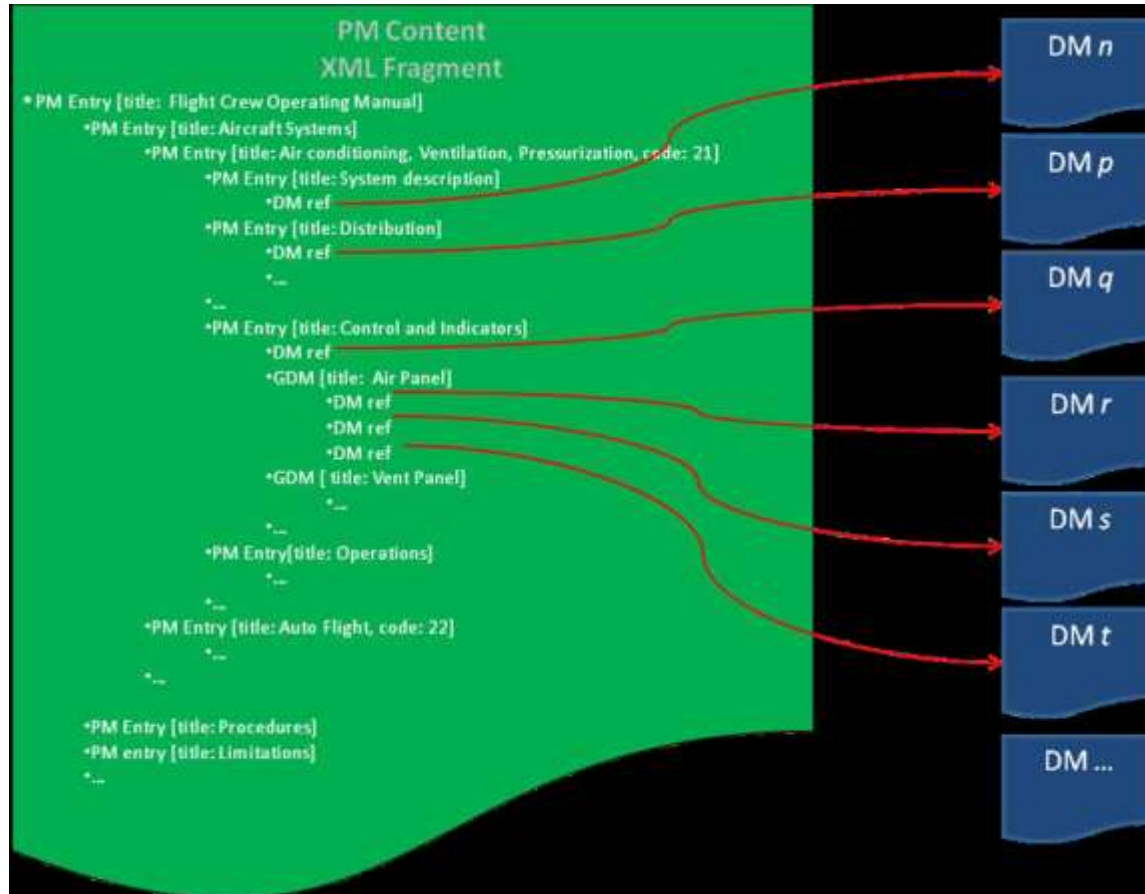
Data Management - Data Module Content and Status



Each DM is composed of two XML fragments:

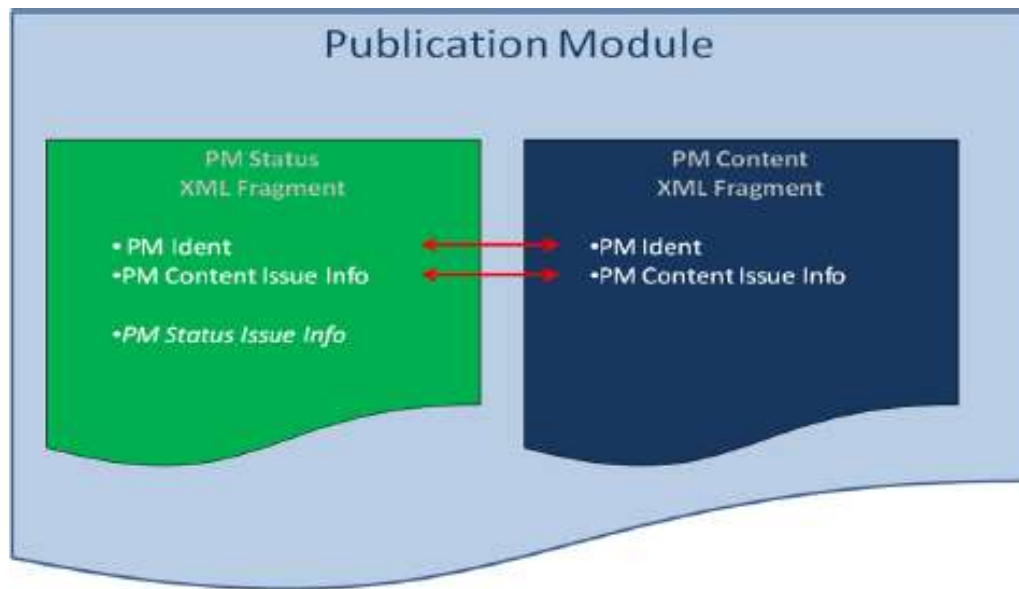
- **DM Content** – the technical content of the DM
- **DM Status** – The related Metadata, including Applicability annotations, revision data and data from certain business concepts.

Data Management - Publication Modules Content and Status



A Publication Module can reference individual DMs, a group of DMs or another PM.

Data Management - Publication Modules Content and Status

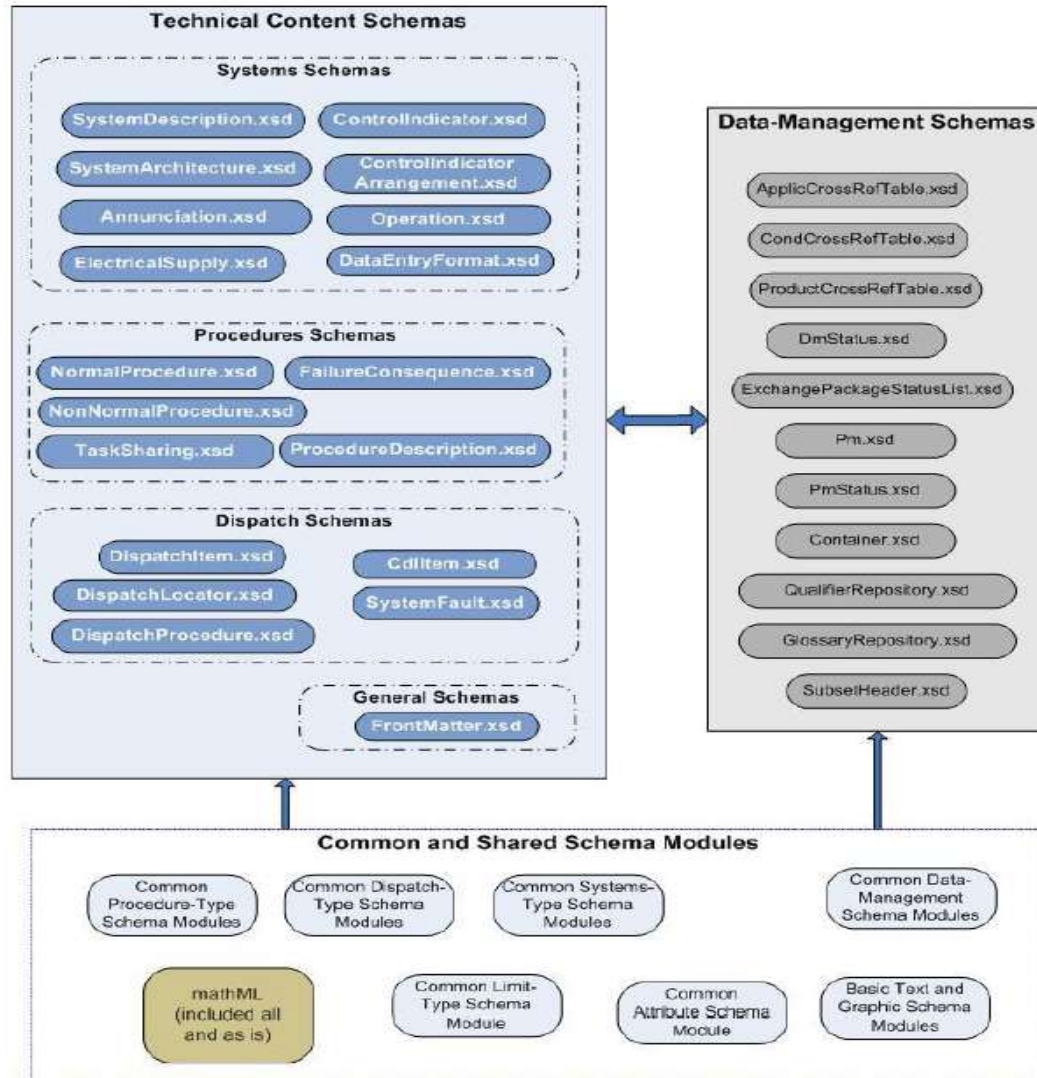


Each PM is composed of two XML fragments:

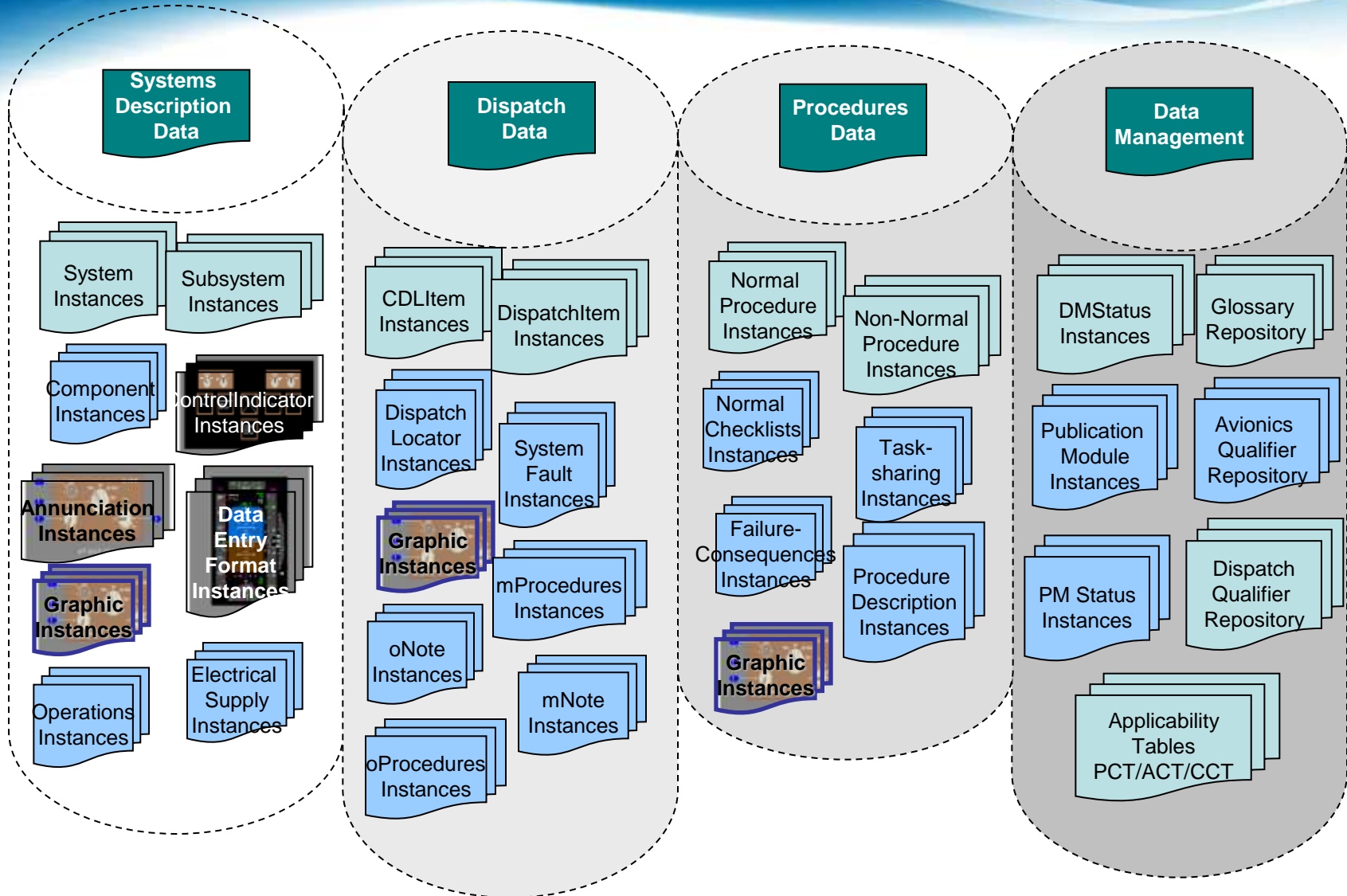
- **PM Content** – the technical content of the PM (a series of references to DMs and PMs)
- **PM Status** – the Metadata related to the publication module.

Schema Module Hierarchy and Relationship

FOML – XML Schemas Layout

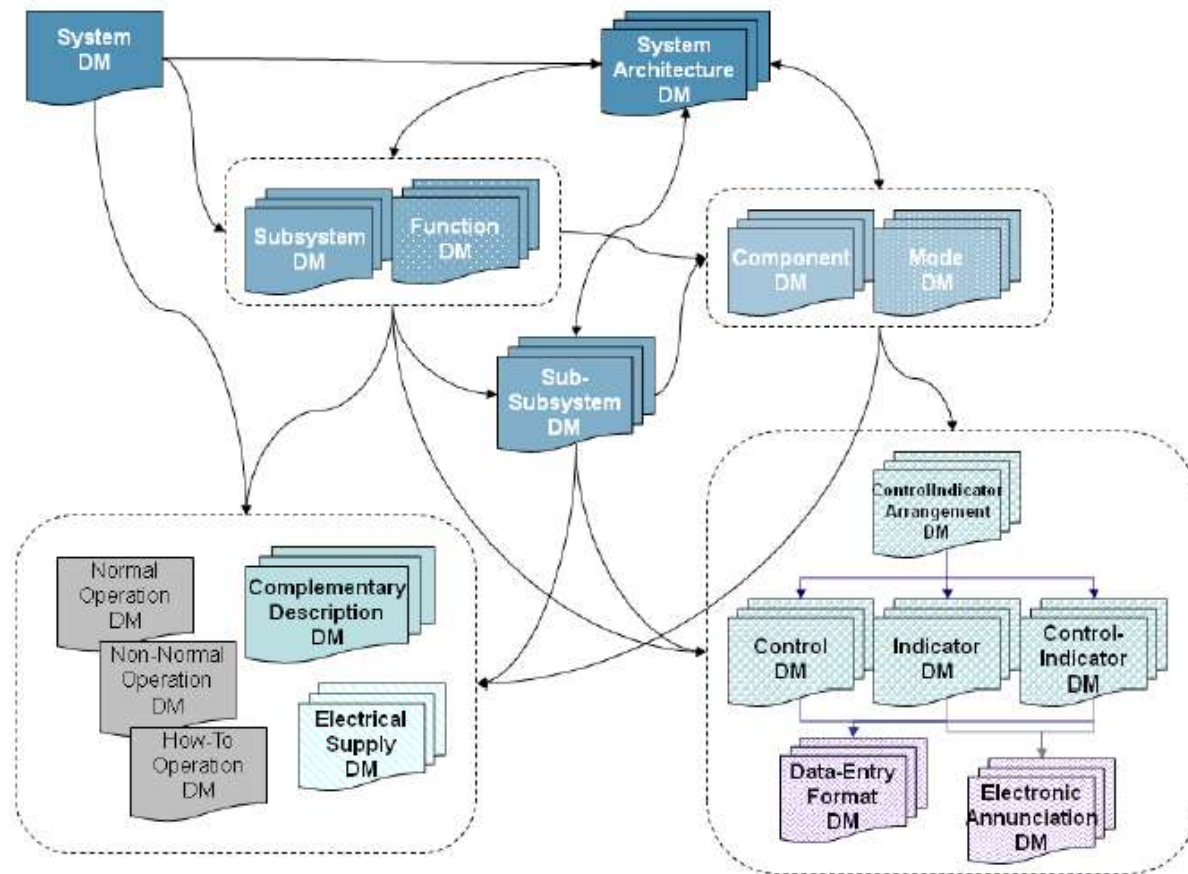


Information Types and Instances From Spec 2300



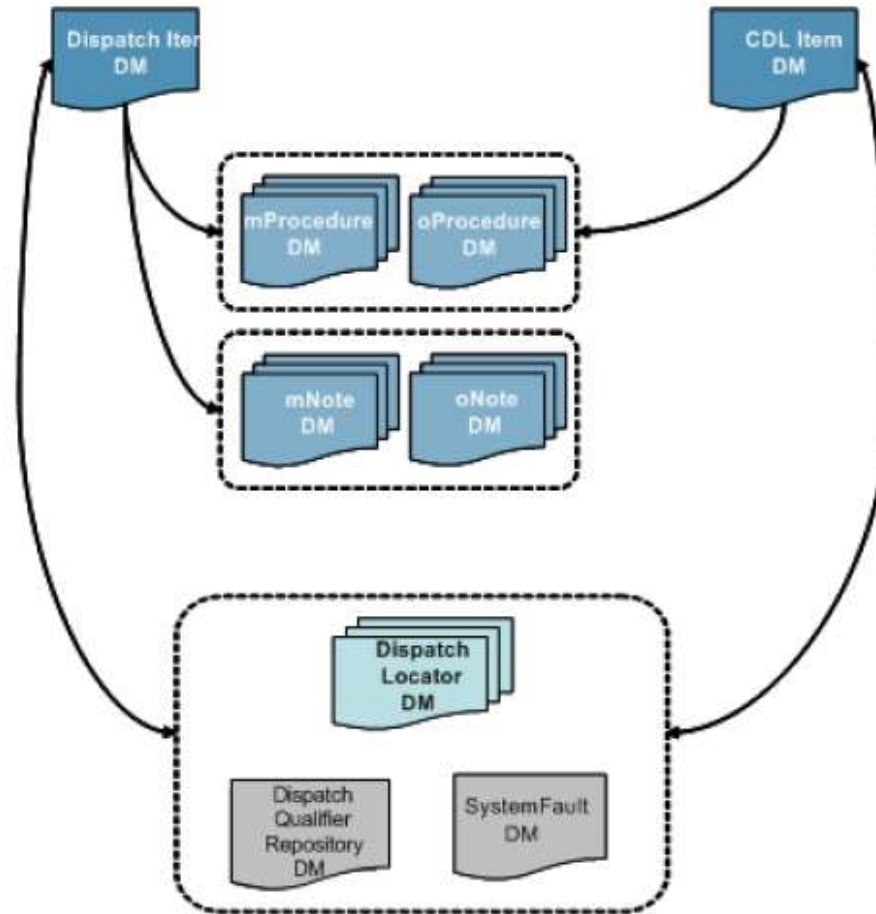
Data Module Relationship for System Description

Figure 3-1 System Description Data Module Relationships



Data Module Relationship for Dispatch Data

Figure 3-2 Data Module Relationships

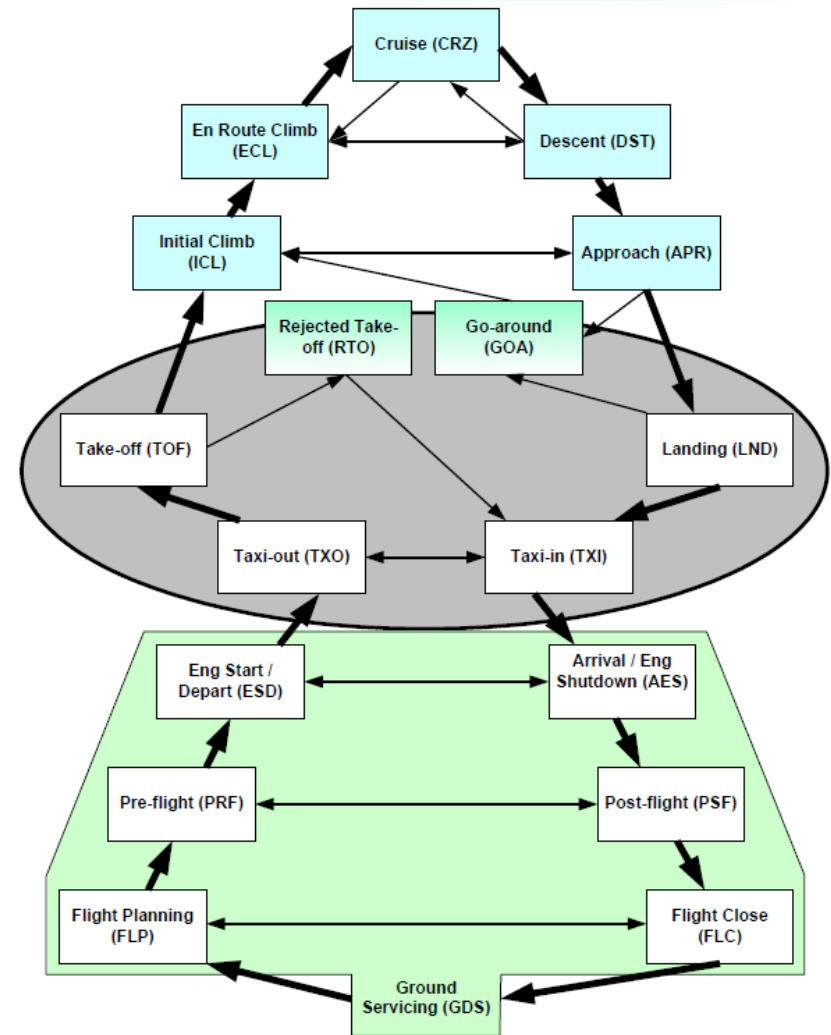


Appendices: ATA Flight Operations Standard Numbering System

- **Spec 2300 includes a Flight Operations SNS.**
 - **The flight operations SNS follows the same ATA and S1000D numbering systems and adapts for Flight Operations data:**
 - **Maintain current ATA SNS numbering scheme at the chapter level and wherever else it is possible**
 - **Change some subchapter nomenclature and definitions to make the SNS much more usable for Flight Operations**
- **Flight Operations SNS is used in the DMC and ICN, similar to the S1000D convention for data identification and organization**
- **ATA Spec 2300 has a complete list of Flight Operations Systems, Subsystems and their definitions**

Appendices: ATA Phase of Flight Specification

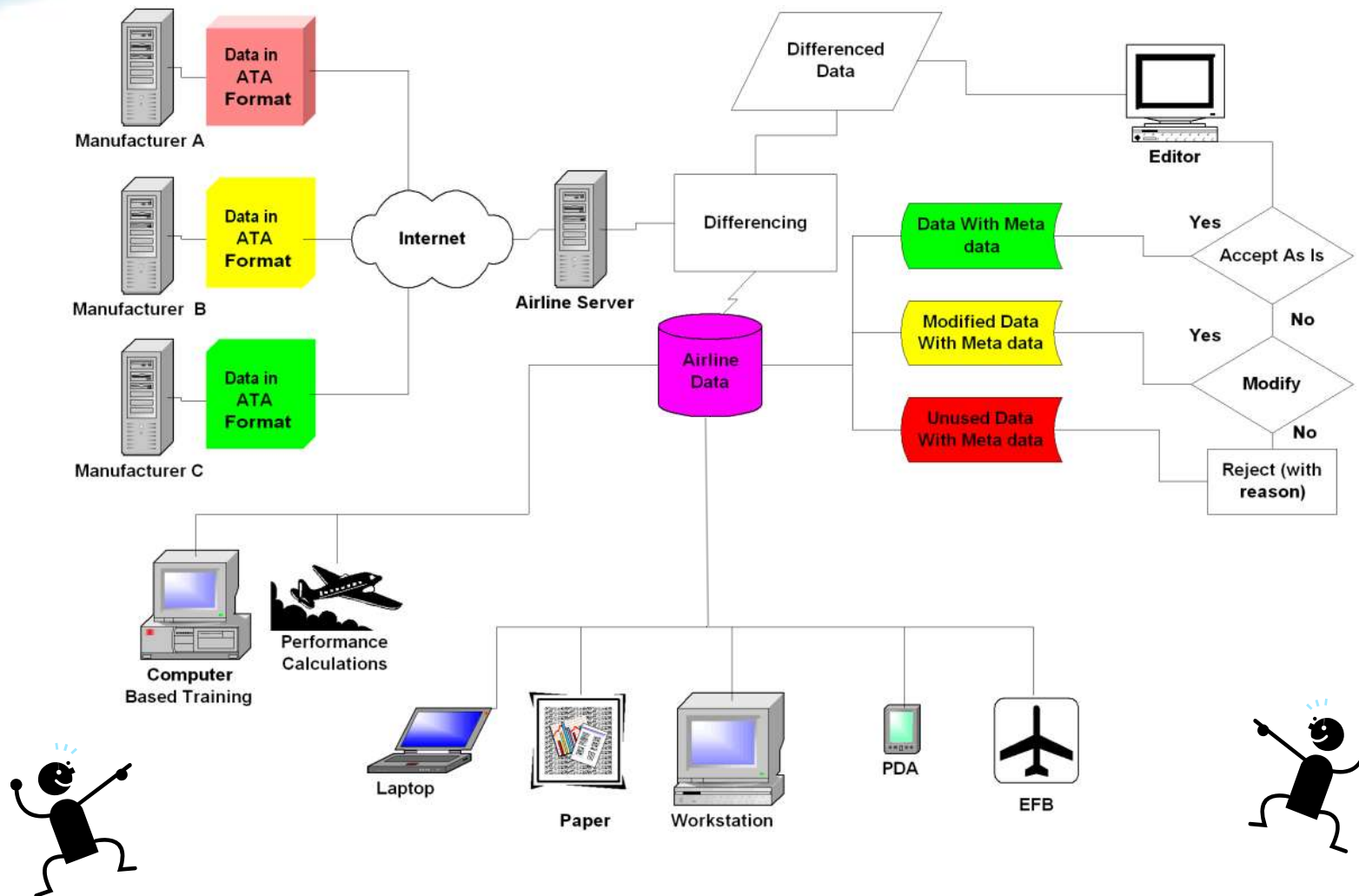
- Spec 2300 contains the ATA Phase of Flight Specification
- Provides the definition for each Phase of Flight
- Identifies the transitions and relationships between various Phases of Flight



Spec 2300 Anticipated Benefits

- **Standardization of the data from all OEMs, not just in terms of following the same structures (i.e. Schemas), but the information will be consistently authored, organized and exchanged**
- **Consistently structured information will improve overall crew performance.**
- **Airlines will be able to source publishing solutions that will maximize efficiency in their workflow.**
- **Content reuse can become a reality**

Spec 2300: A Single System for all Data



Q & A

Thank you for attending this presentation

and

We'd like to have your participation