Enabling Quality Supplier Requirement Development and Exchange Supporting MBSE

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Quality Requirements and Digital eXchange

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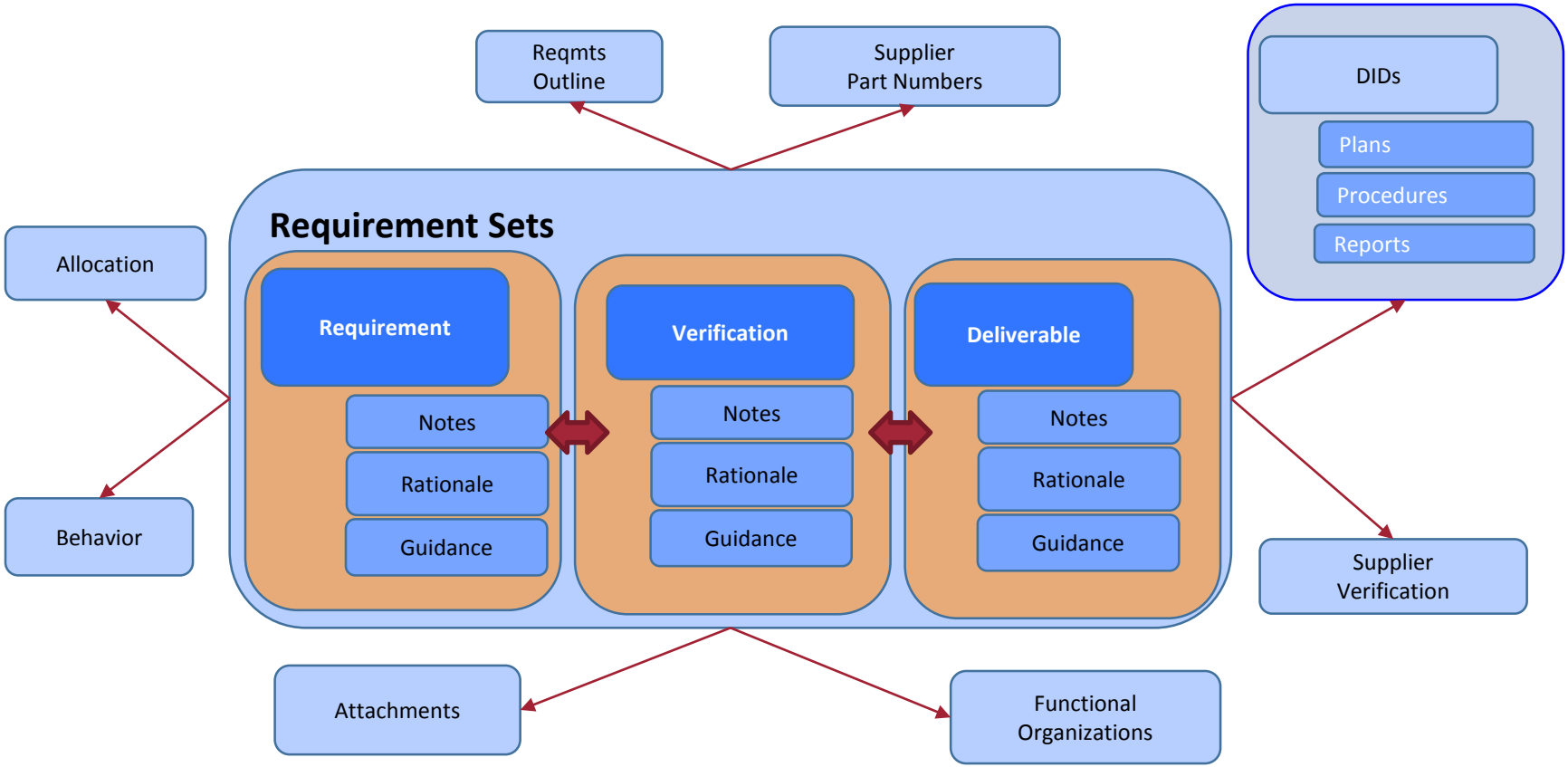
Neil is an Subject Matter Expert at Boeing in Business Capabilities development and a specialist in the Supplied Parts business lifecycle. He is responsible for long term Boeing Business Process & Tool Strategies in these areas, where he influences new and emerging Boeing technologies evolving Supplied Parts Business life cycle.

Neil represents Boeing at Industry forums to configure Standards, drive strategies and support Boeing initiatives to evolve the engineering products and the digital thread enabling the interoperability across company organizations.

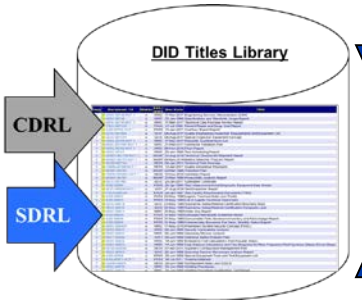
Agenda

- **GPDIS reflection 2017, 2016**
  - **MBSE Requirements Integration**
  - **MBSE DID Standards and Format**
- **Current State of Requirements Exchange**
- **Digital Thread Across Model Based Buy Package**

Package Integration from GPDIS 2016



DID standards from GPDIS 2017



Number **Title** **Format**

Document based data

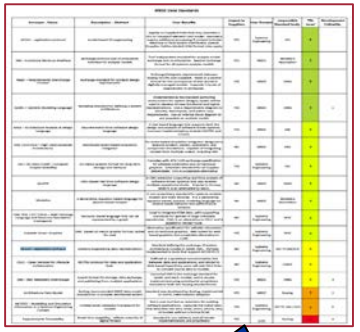
Examples of Typical Document format:

- PDF
- Word
- Excel
- JPG
- TIFF

Model based design

- Model Based Functional Data Standard
- Model Based Logical Data Standard
- Model Based Physical Data Standard AP242

Modeling Standards

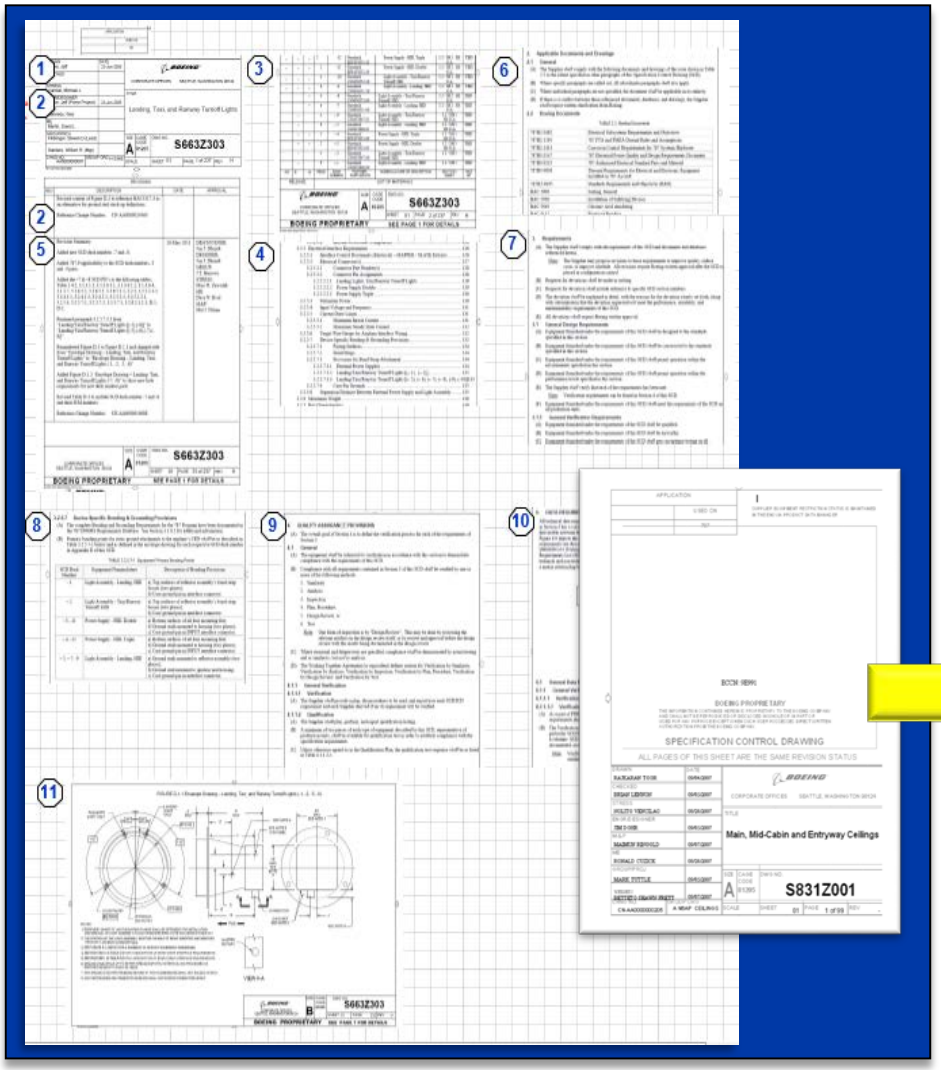


Current State for Requirements

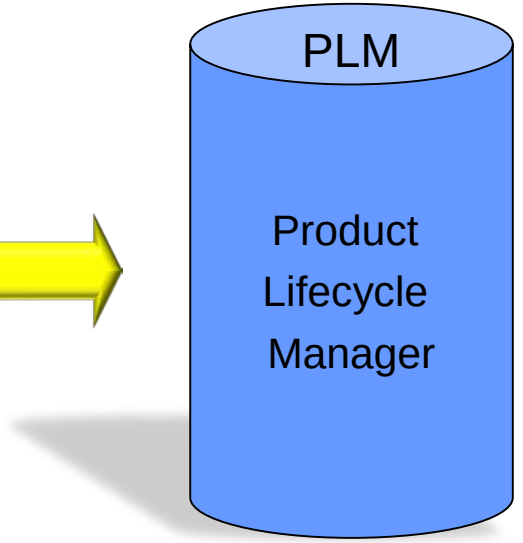
Current Methods – Document Based exchange

- **Requirements Management focused, verification methods and deliverables have a weak or no association to requirements**
- **MSWord, Adobe PDF, Drawings, Associated Files**
- **Separately managed activities for validation, allocation and verification**
- **Documents released to requirements author for approval**
- **Reuse consists of uncontrolled copy paste**
- **Metrics almost non-existent**
- **Metrics are focused on performance to schedule**

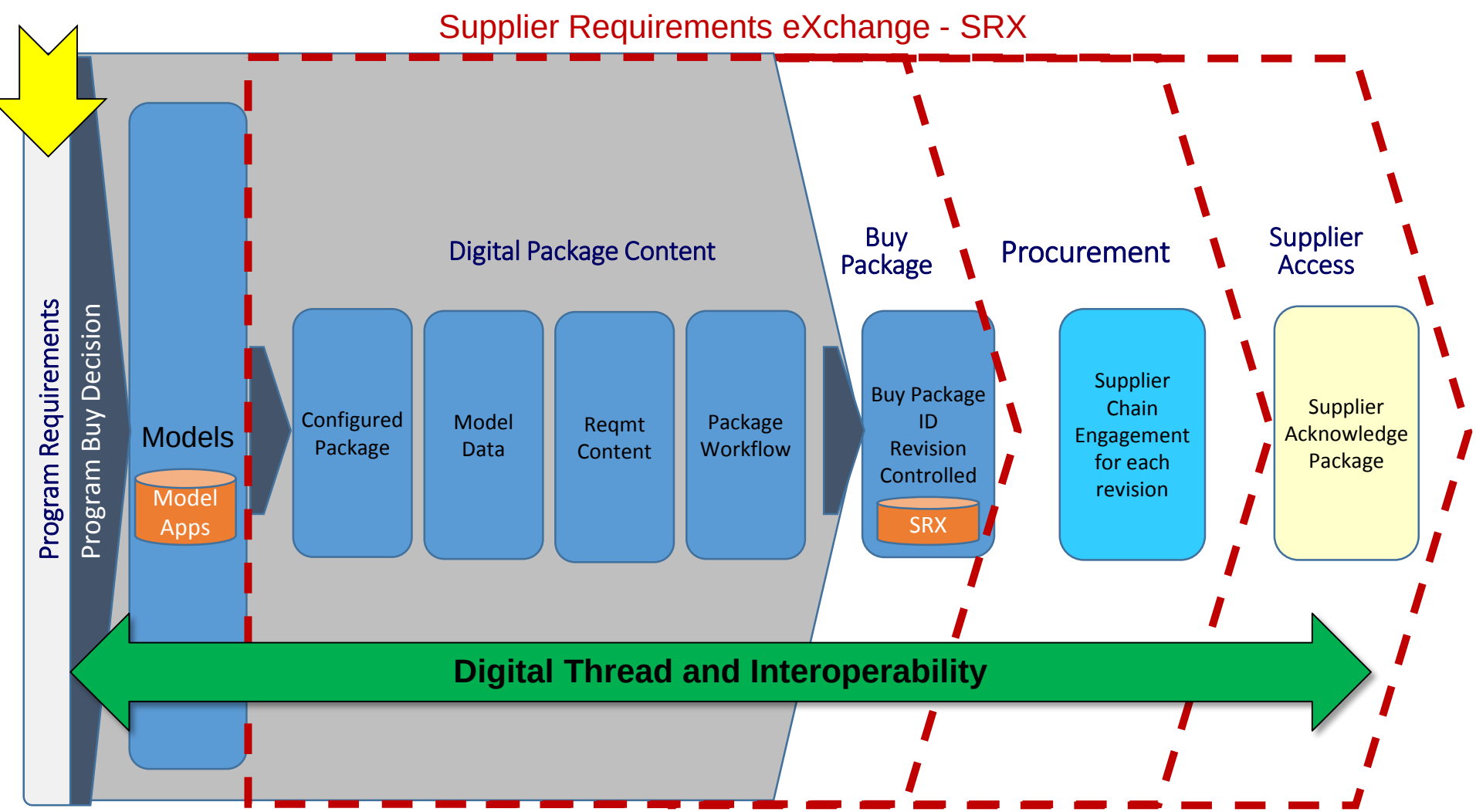
Today.....Buy-packages contain document based SCDs.



The SCD process collects Design Requirements and stores them in PLM as Bookform drawings



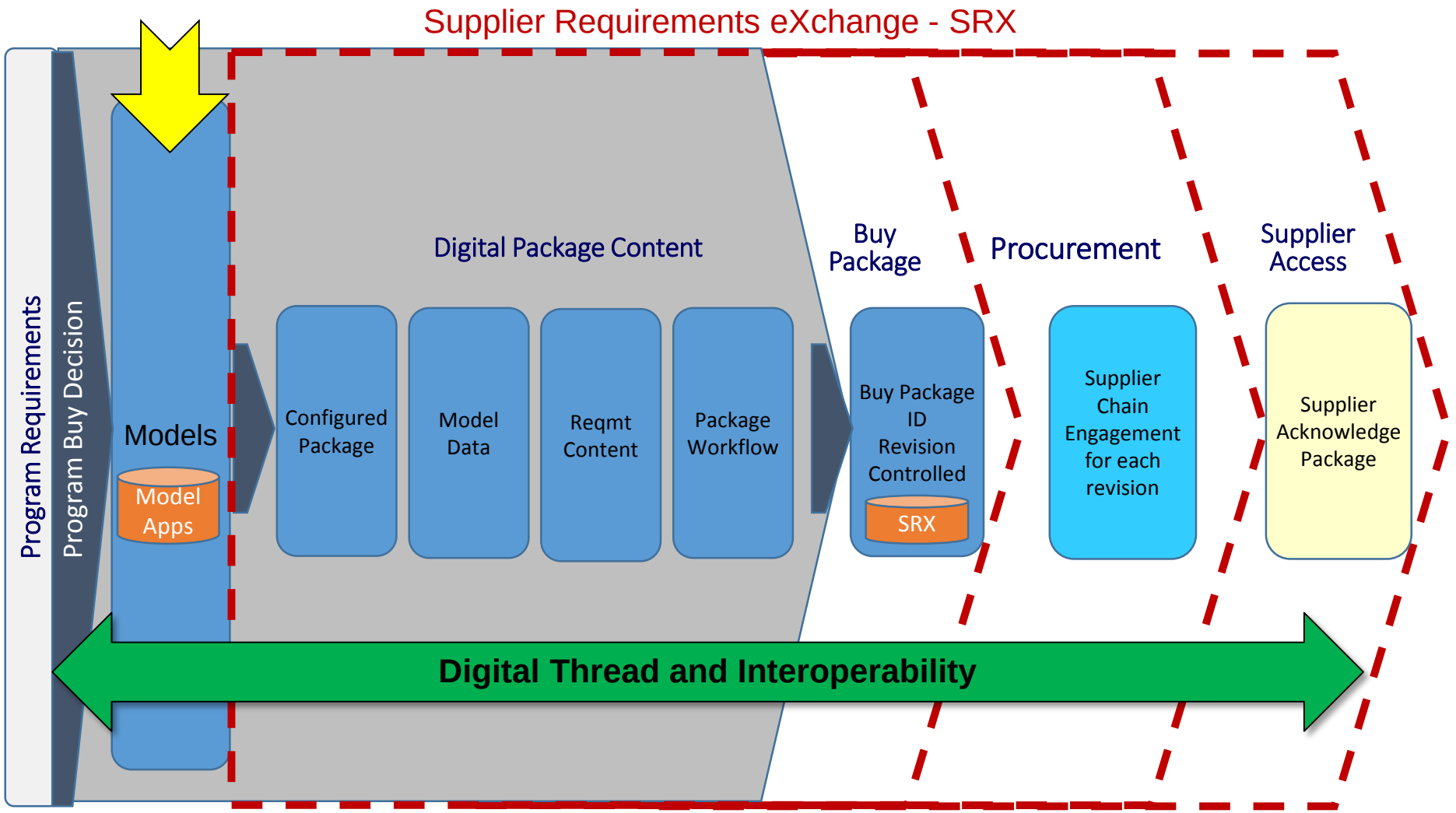
Enabling a Digital Thread Across the Model Based Buy-package



Enabling Product Requirement Design and Packaging

- **Program/product requirements are created as new product demand immerges across the industry**
- **Model Based Engineering improves the quality of requirements and enables product digital twins during the front end of the development lifecycle**
- **It's essential Requirement Owners can digitally flow product requirements to design suppliers**
- **SRX enables model based buy-packaging for product development and requirements exchange, interoperability, and collaboration with suppliers, ensuring configuration control during transfer of requirements and models to suppliers.**

Enabling a Digital Thread Across the Model Based Buy-package



SRX Virtual Shared Workspace

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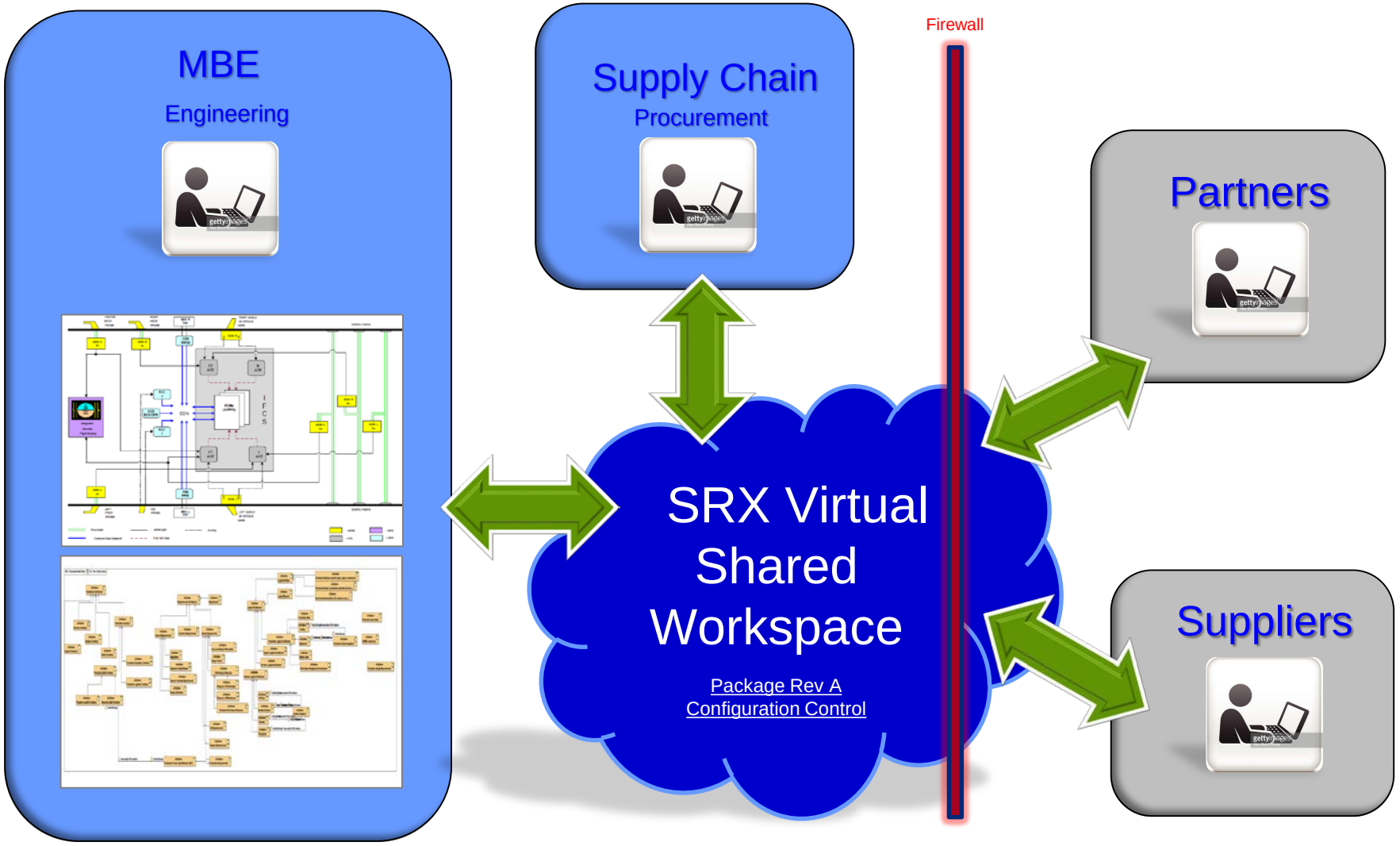

Opportunities presented with Model Based Engineering

- **Requirement Quality and Reuse**
  - Improves Data Quality
  - Reduces effort for creation and review
  - Takes advantage of previous work
  - Provides consistency for compliance

- **Advanced Analytics Available**
  - Ability to use metrics to assist the user in creating quality Data relationships to requirements
  - Availability of customized group and program metrics and reporting

- **Product Reliability & Maintainability**

- **Expanded capability for integration of requirements and data**

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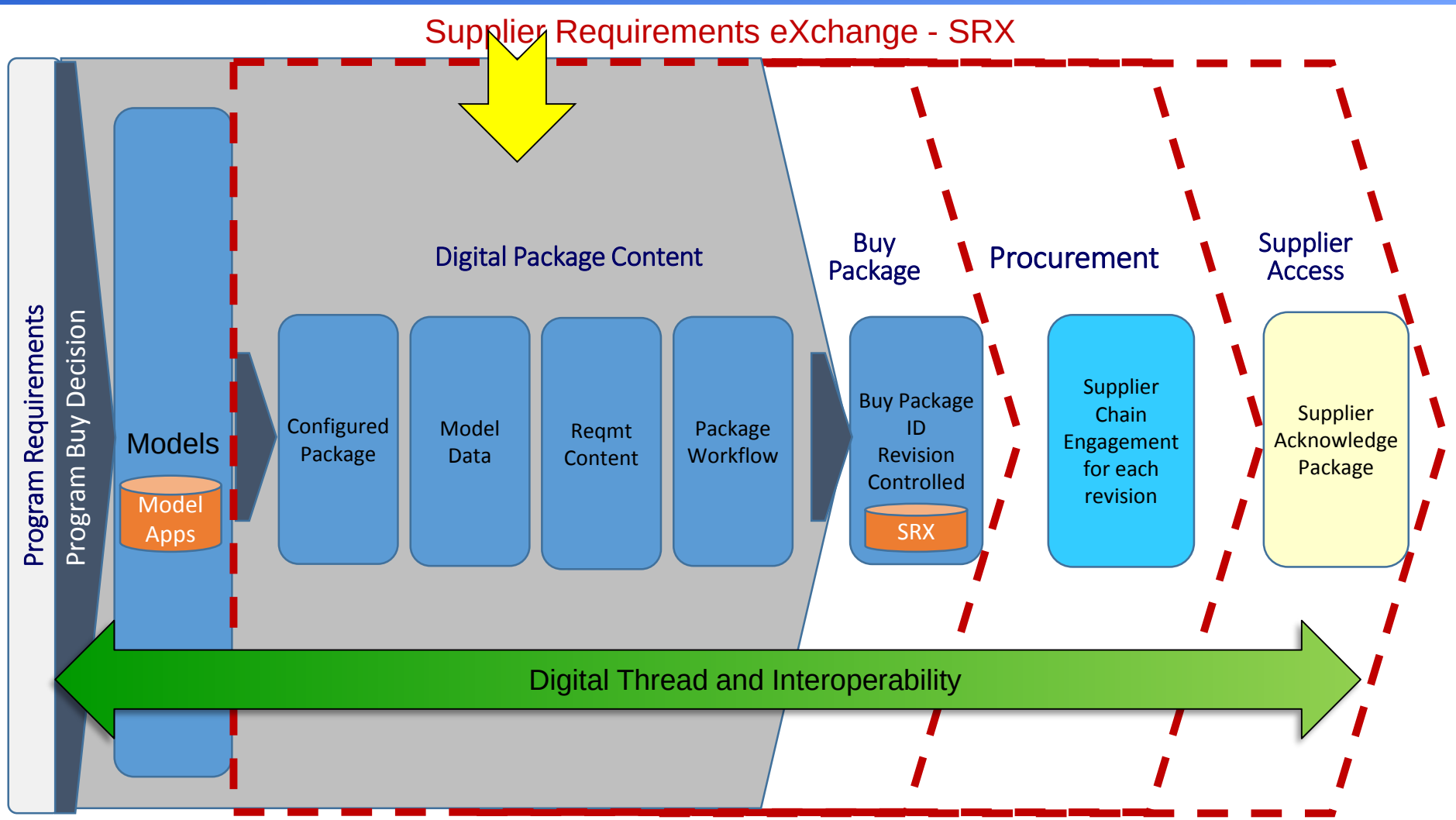
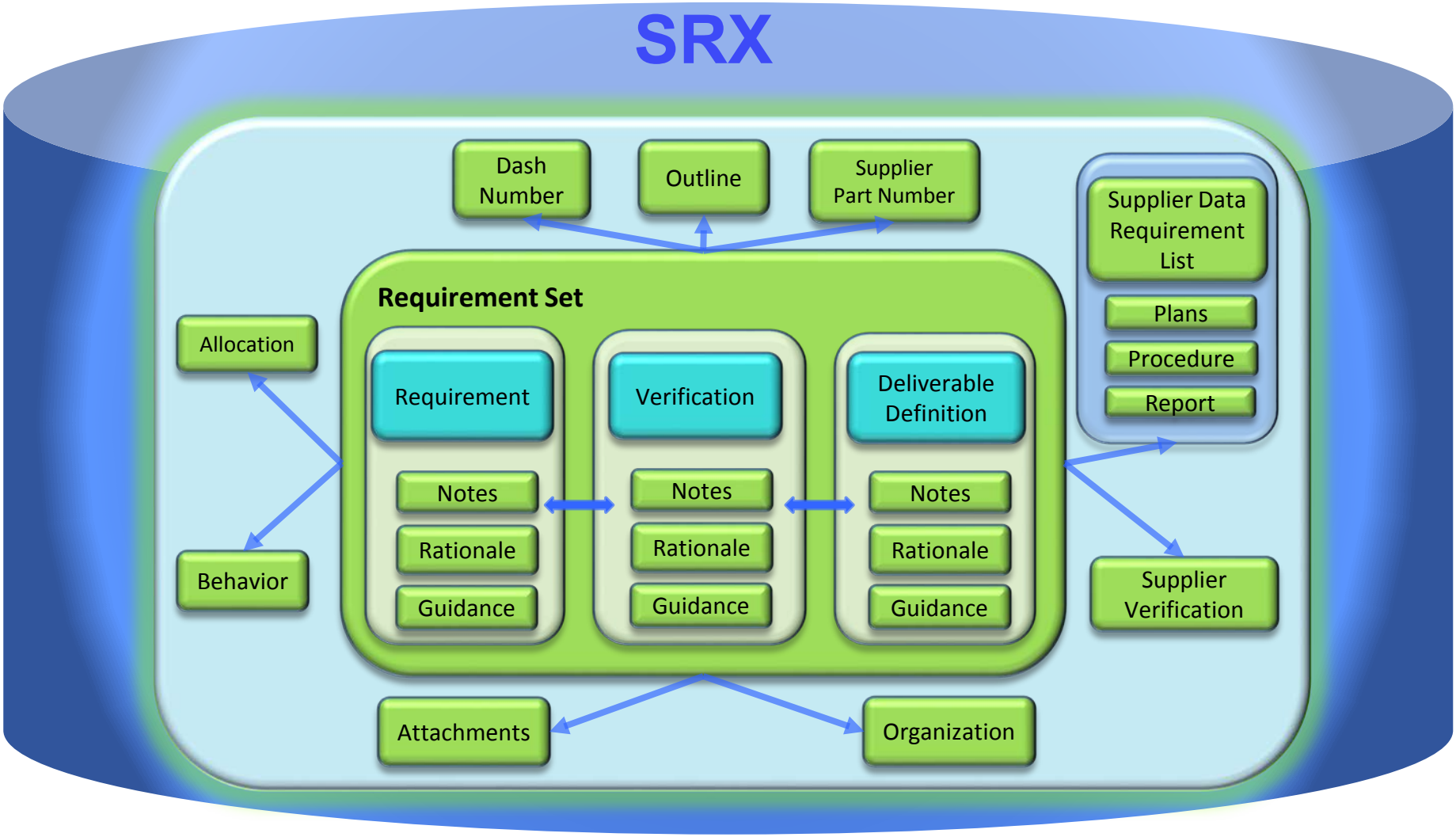


SRX Relational Requirement Set Integration



Using SRX to Package Requirements

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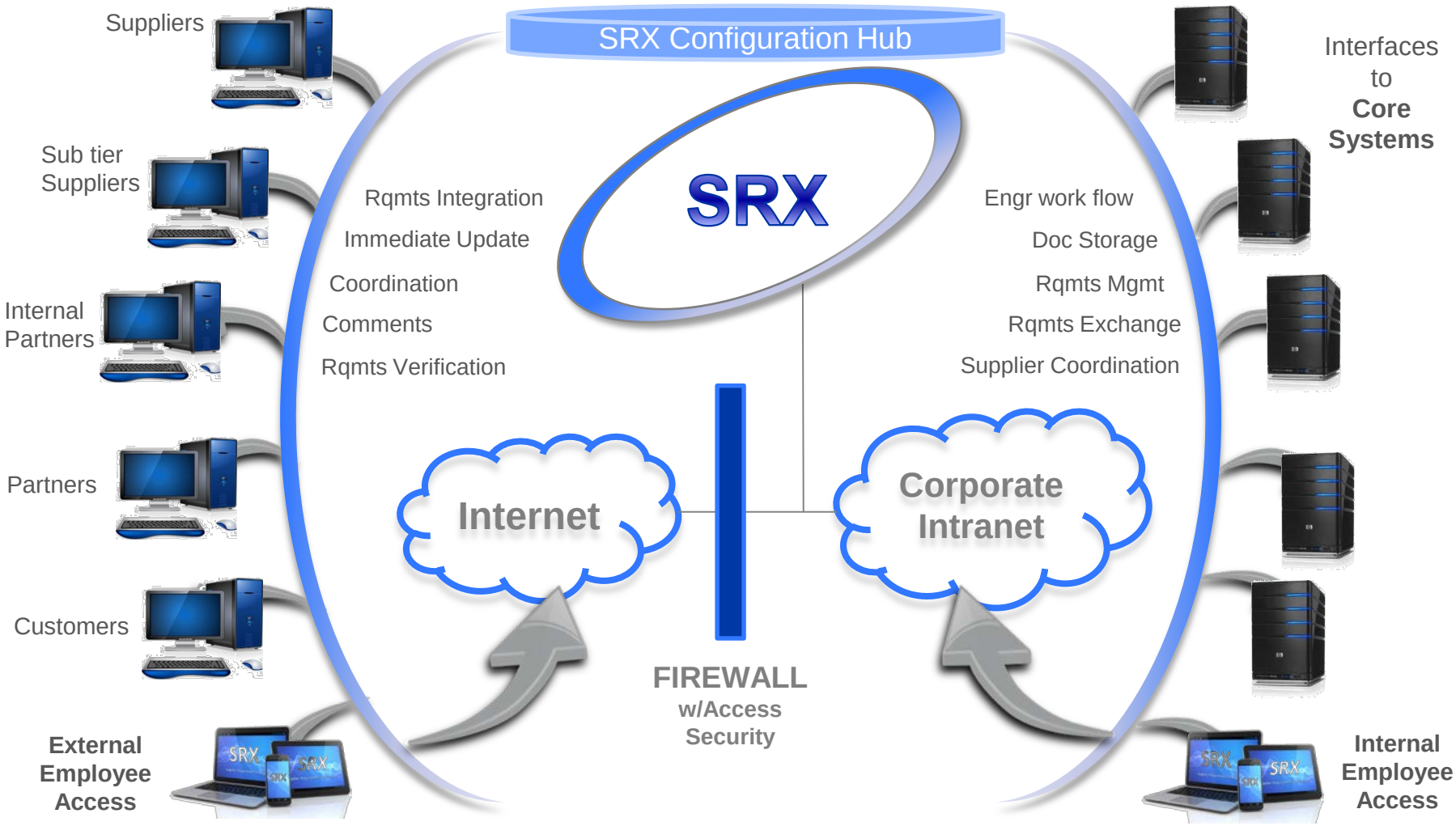
Patent Pending No. 14/811,315



What is Supplier Requirement eXchange (SRX)?

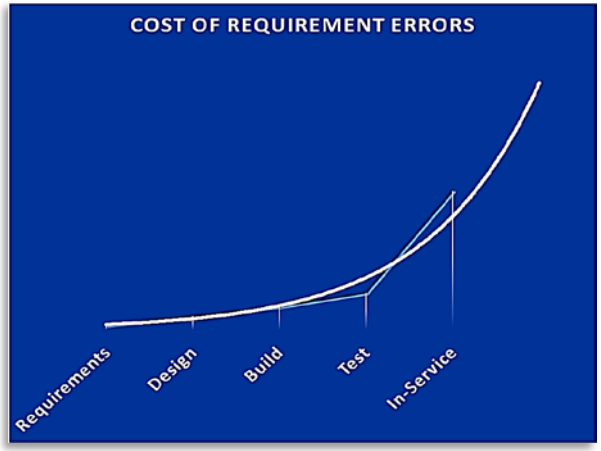
- SRX enhances the Buy-package integration between Design Engineering, Supplier Management and Design Suppliers

- SRX supports systematic generation of Supplier design requirements and enables innovative, affordable and value driven Aerospace product designs

  - Suppliers can access SRX without costly licensing fees
  - Supplier collaboration in a shared environment
  - Establishes metrics for managing requirement first pass quality
  - Improves requirement quality by using Structured Requirements
  - Aligns with Industry Model Based Engineering initiatives

- SRX customizes interaction based on roles for Engineering, Stakeholders and Procurement Agents during the model based requirements development and exchange to first pass quality of the design requirements

- SRX leverages digital data to accelerate change throughout the business
  - Support Model Based Systems Engineering (MBSE)
  - Enable packaging various models and requirements, while maintaining configuration control during exchange with suppliers



Requirements delivered at a much higher quality avoiding costly errors found later

Engineering Requirements Authoring Tasks

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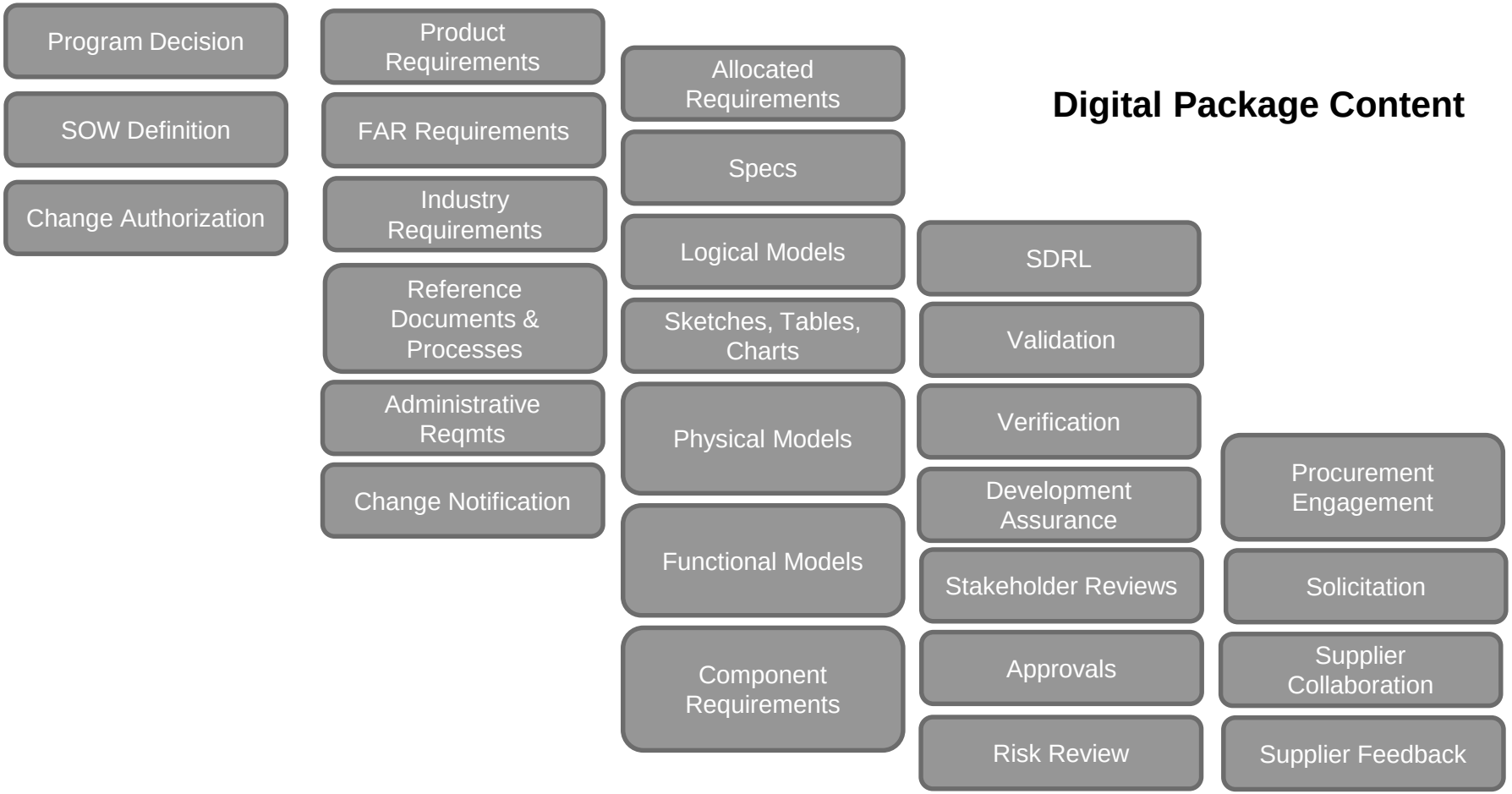
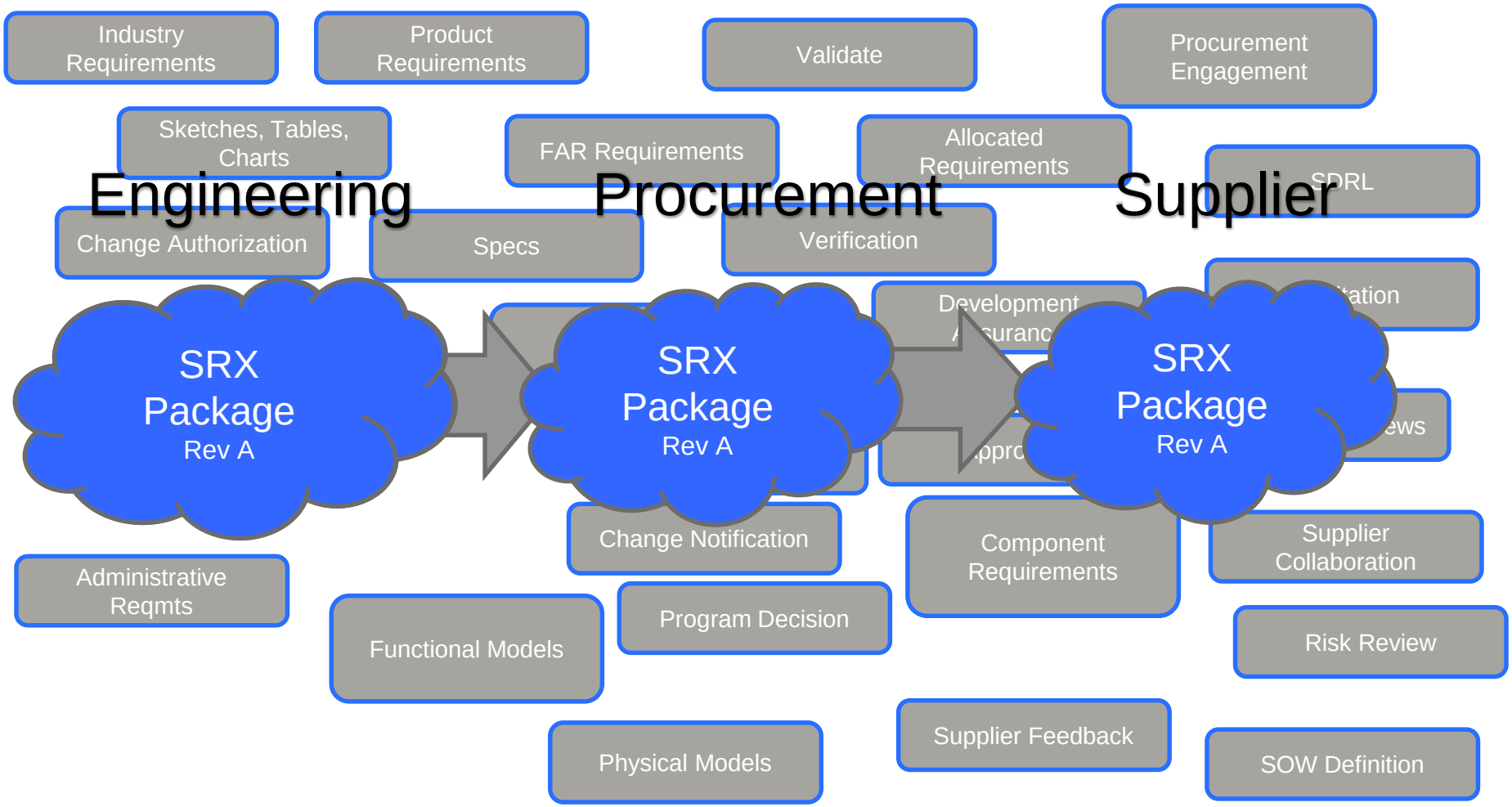


SRX Workflow Management of Authoring Tasks



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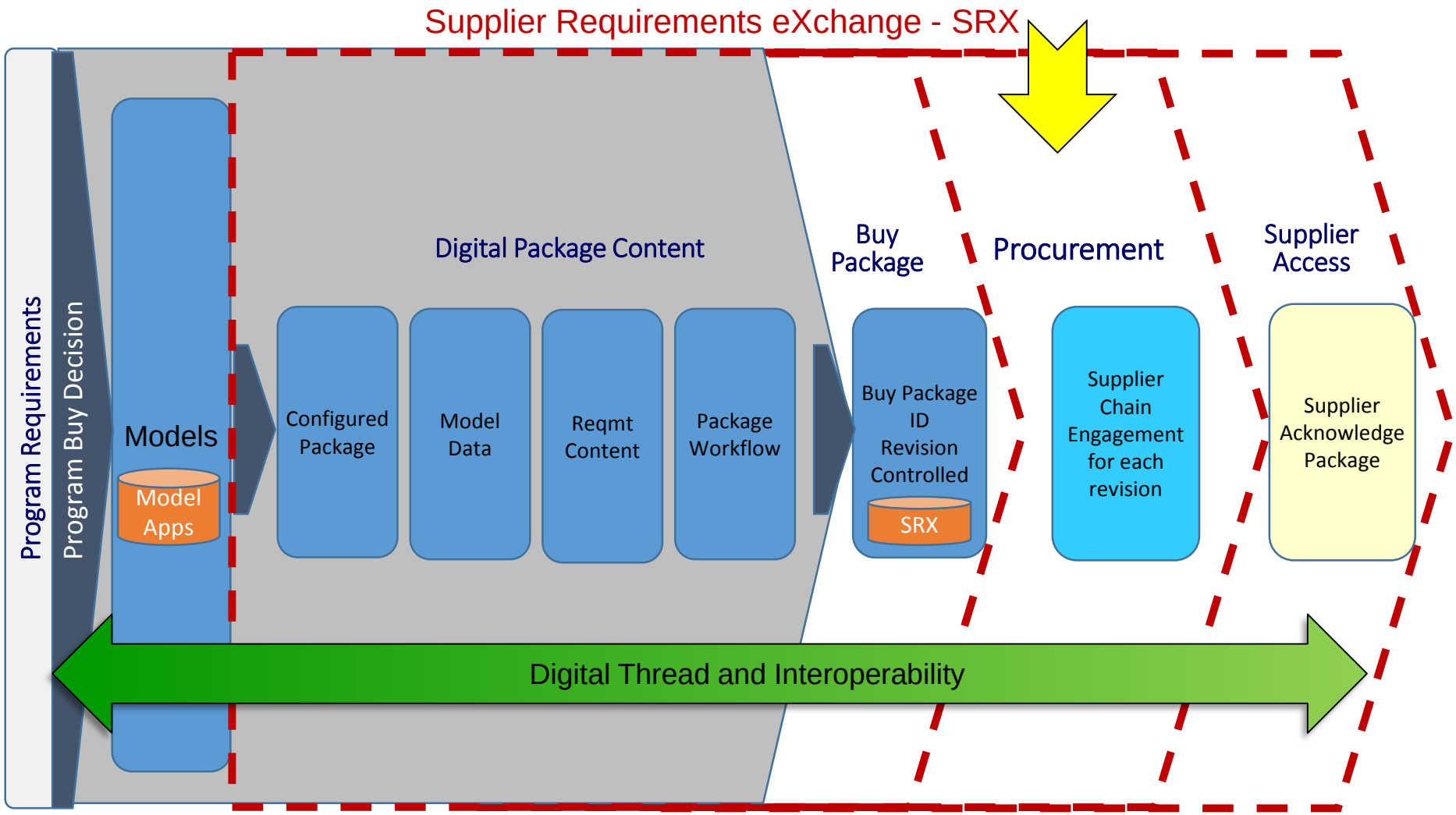
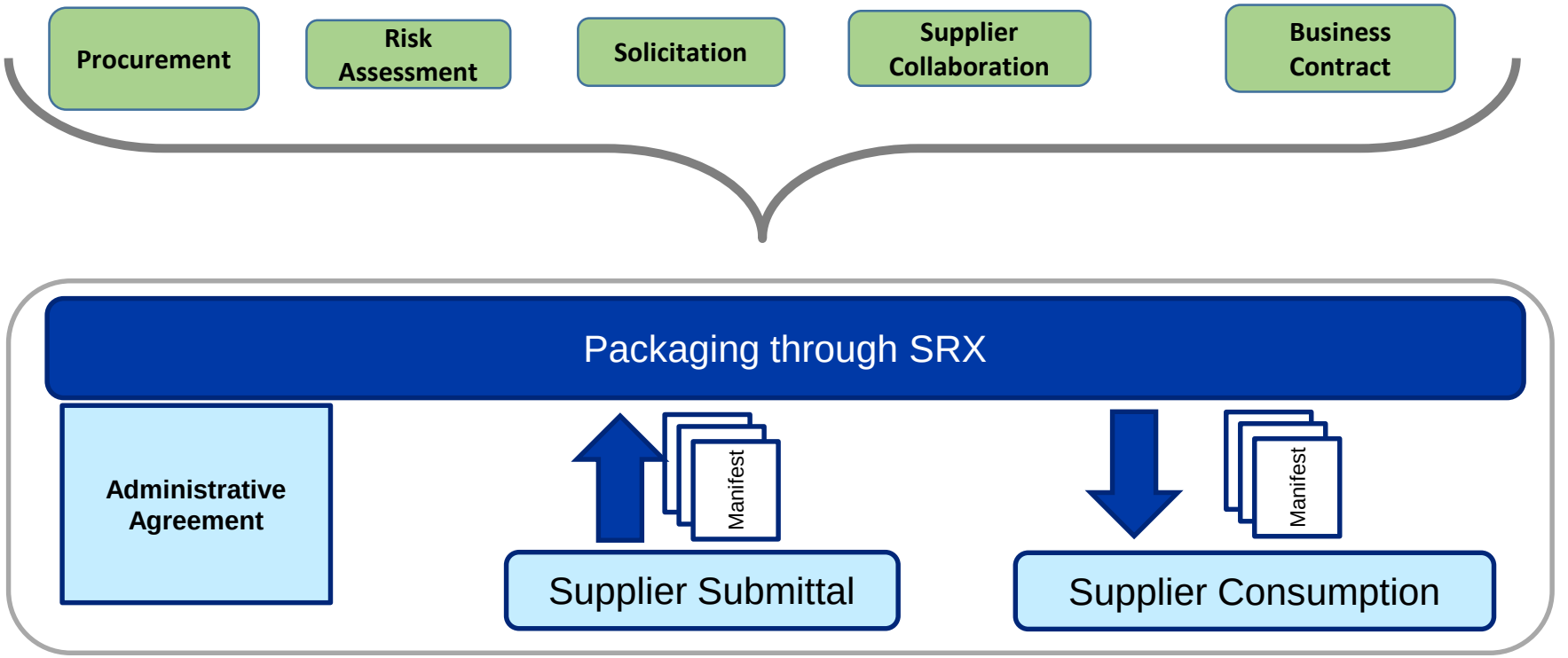


Buy-package Procurement Engagement



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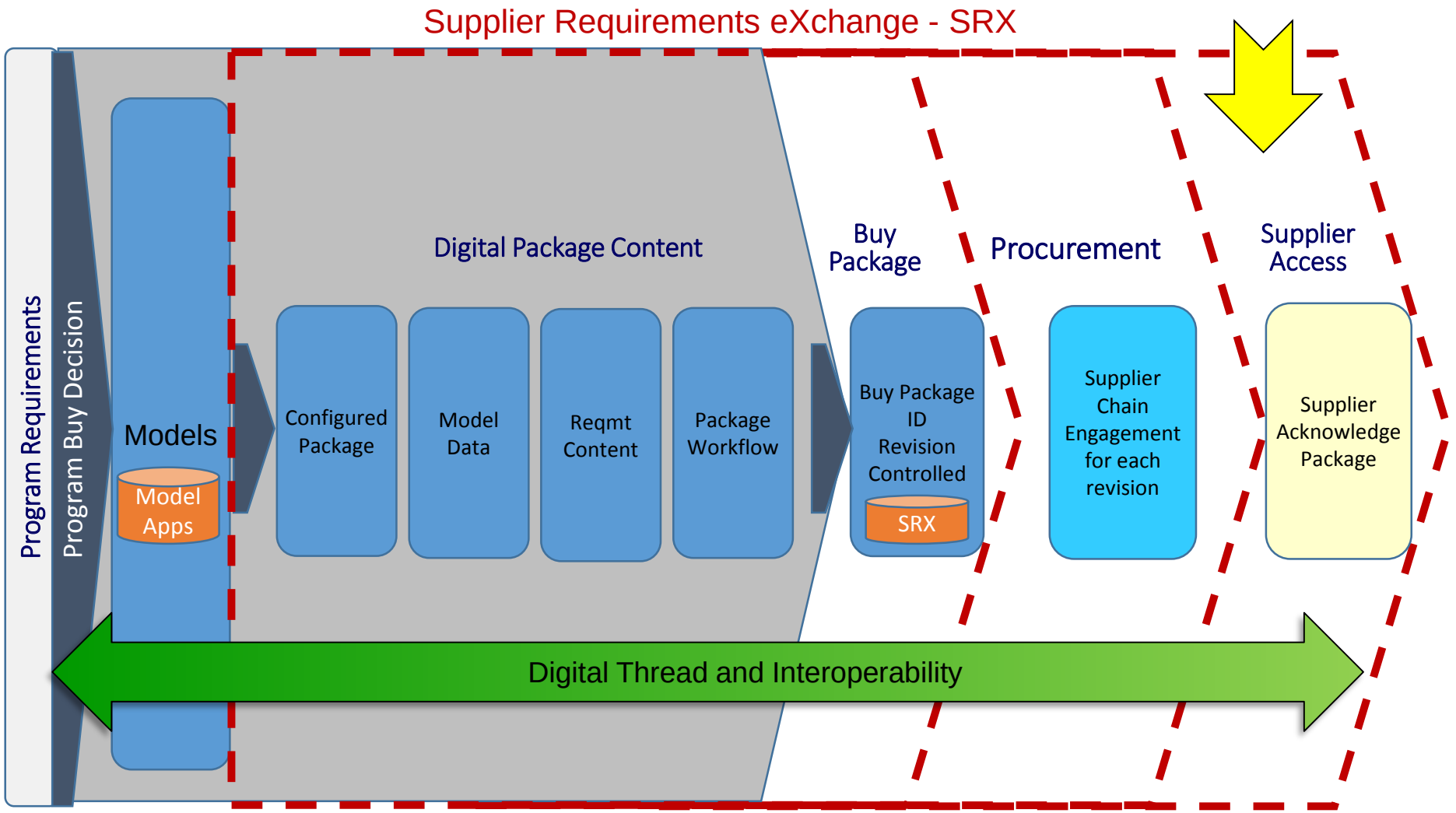
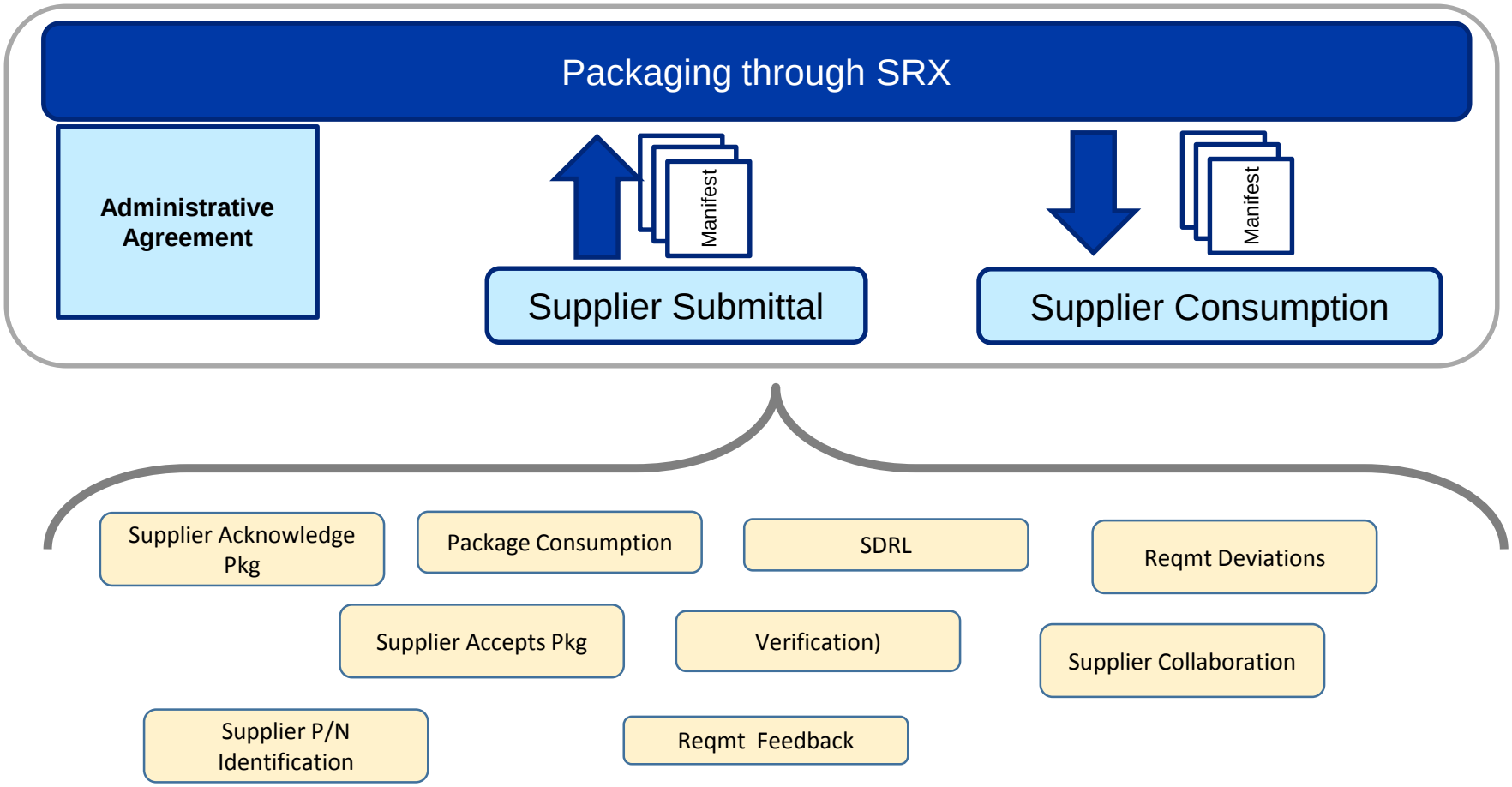


Supplier Access to SRX Buy-package

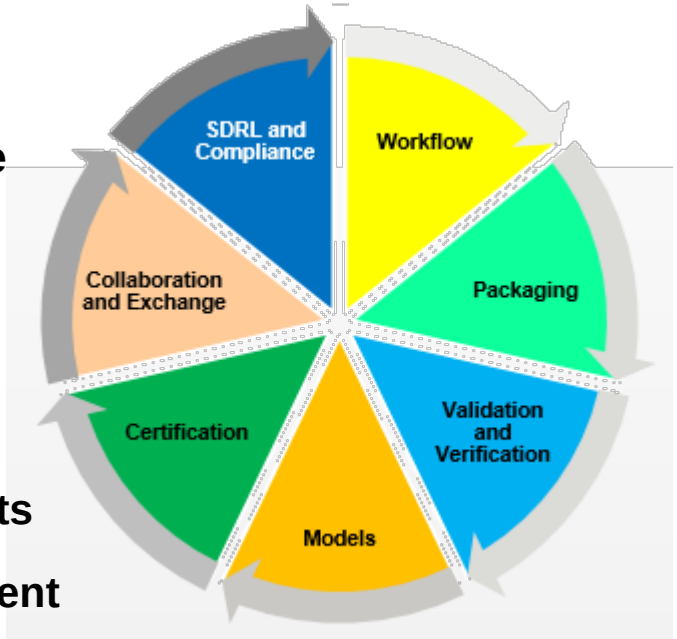


Changing the Culture of Buy-Package Development

- Creating a working environment—a culture—that enables step-change improvement in our Supply Chain and in the areas of Quality and Engineering
- Leveraging data and analytics to accelerate change throughout the business – changes that are necessary for us to compete
- Removing silos to capitalize on collaboration and replication
- Disrupting our business-as-usual mindset by incorporating speed and agility into everything we do
- Enabling reuse of supplier product across domains aligned with product requirements and compliance

Business Value of SRX

- ✓**Provides single source data and establishes baseline metrics for requirement cost & quality improvements**
- ✓**Provides visibility of requirements performance relative to product milestone completion**
- ✓**Mitigates cost overruns due to requirement quality and defects**
- ✓**Digital requirement reuse**
- ✓**Utilizes Collaboration to validate and verify requirements**
- ✓**Reduces effort for Engineering requirements development**
- ✓**Supports Model Based Systems Engineering (MBSE) interoperability**



MBX Transition

Questions and Discussion