NW Engineering Process Modeling

PRESENTED BY

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SAND2020-2057PE

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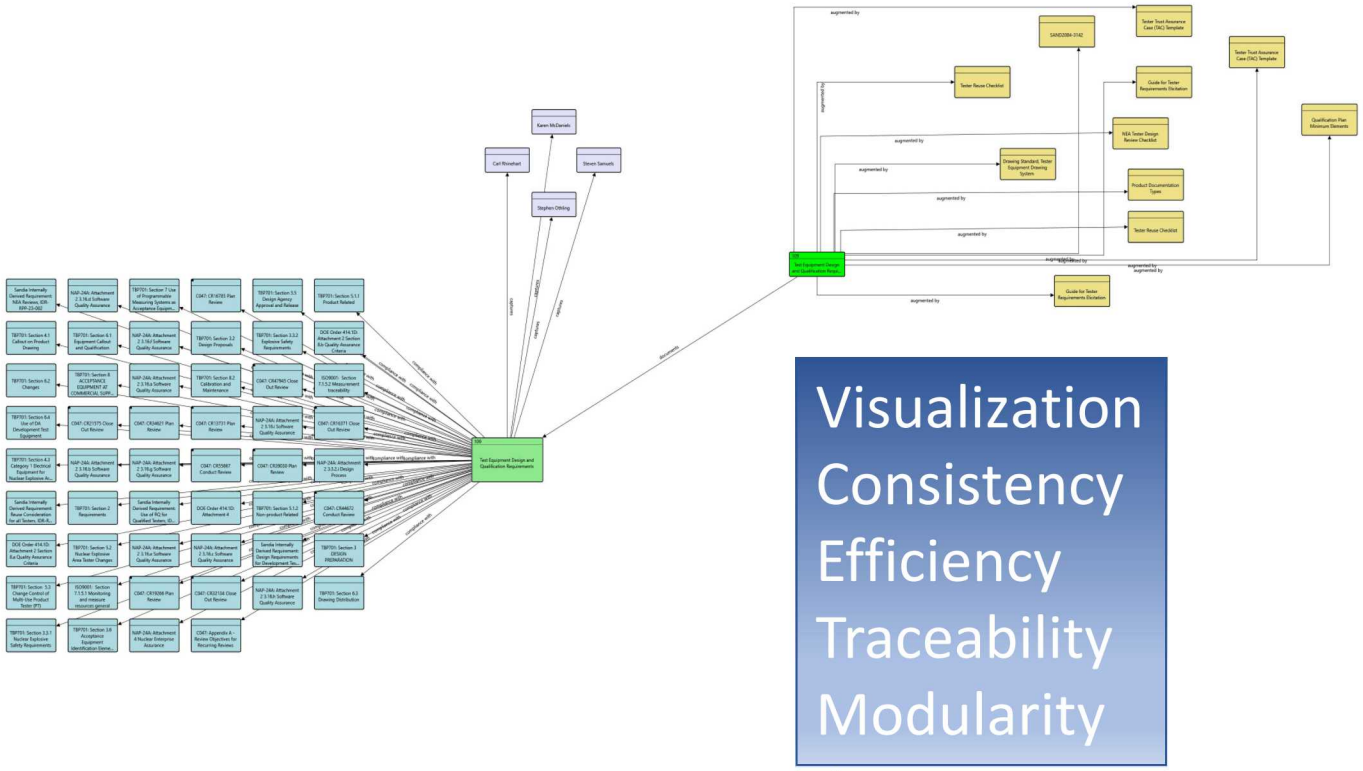
Traditional

Future



Visualization
Consistency
Efficiency
Traceability
Modularity

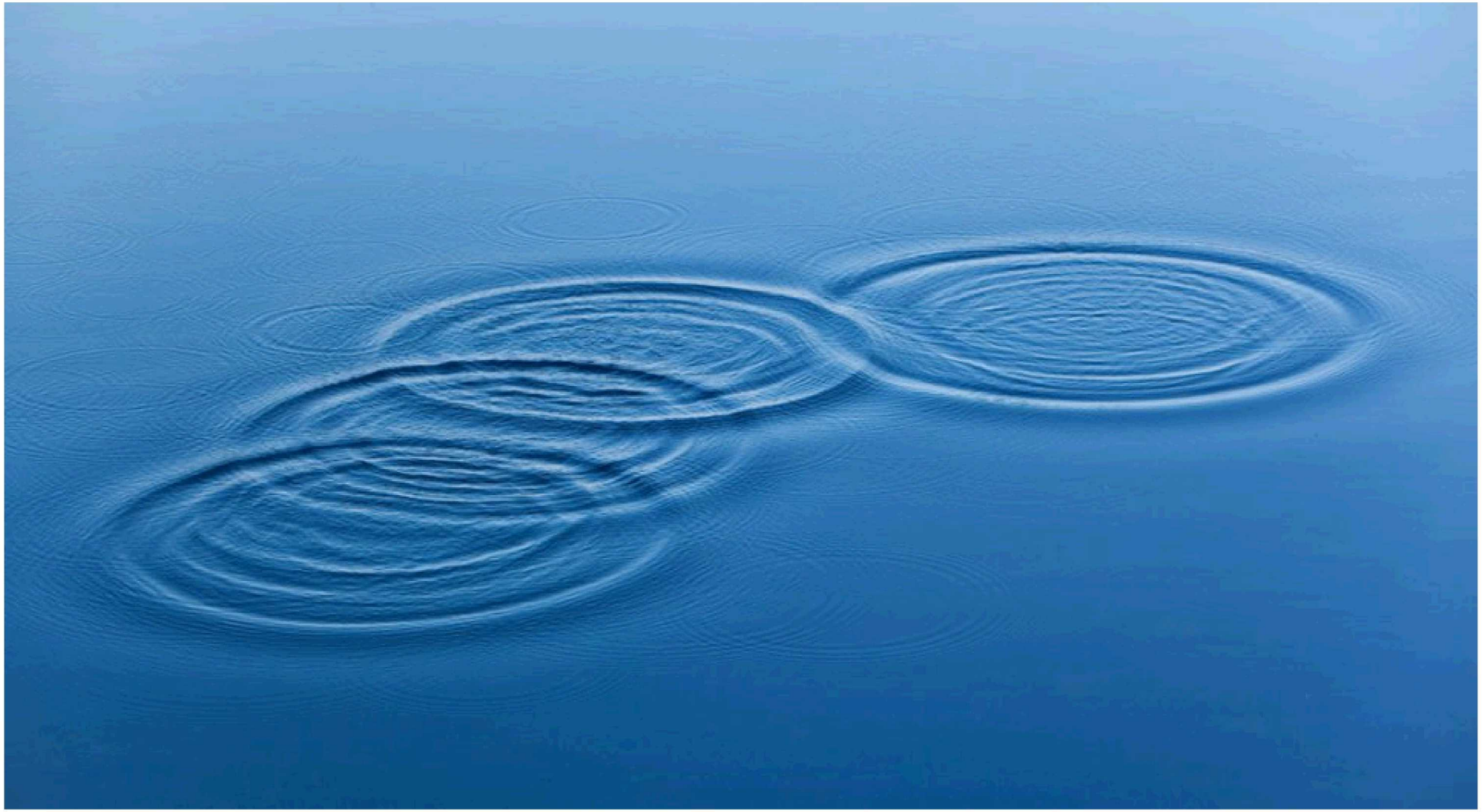
Ripple effect of interconnected artifacts

Programmatic Process

Requirements

Stakeholders

Schedules



Sustainability

MBSE Approach

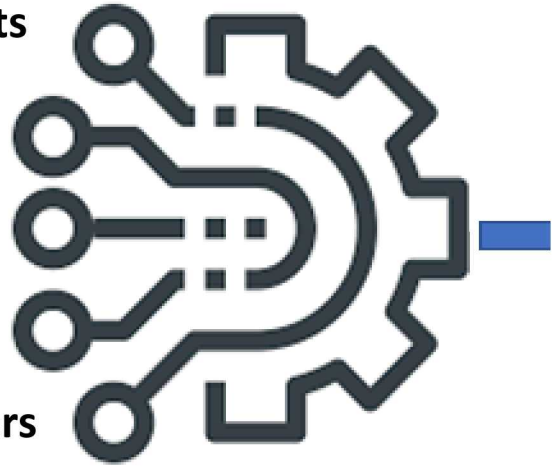
Subject Matter Experts

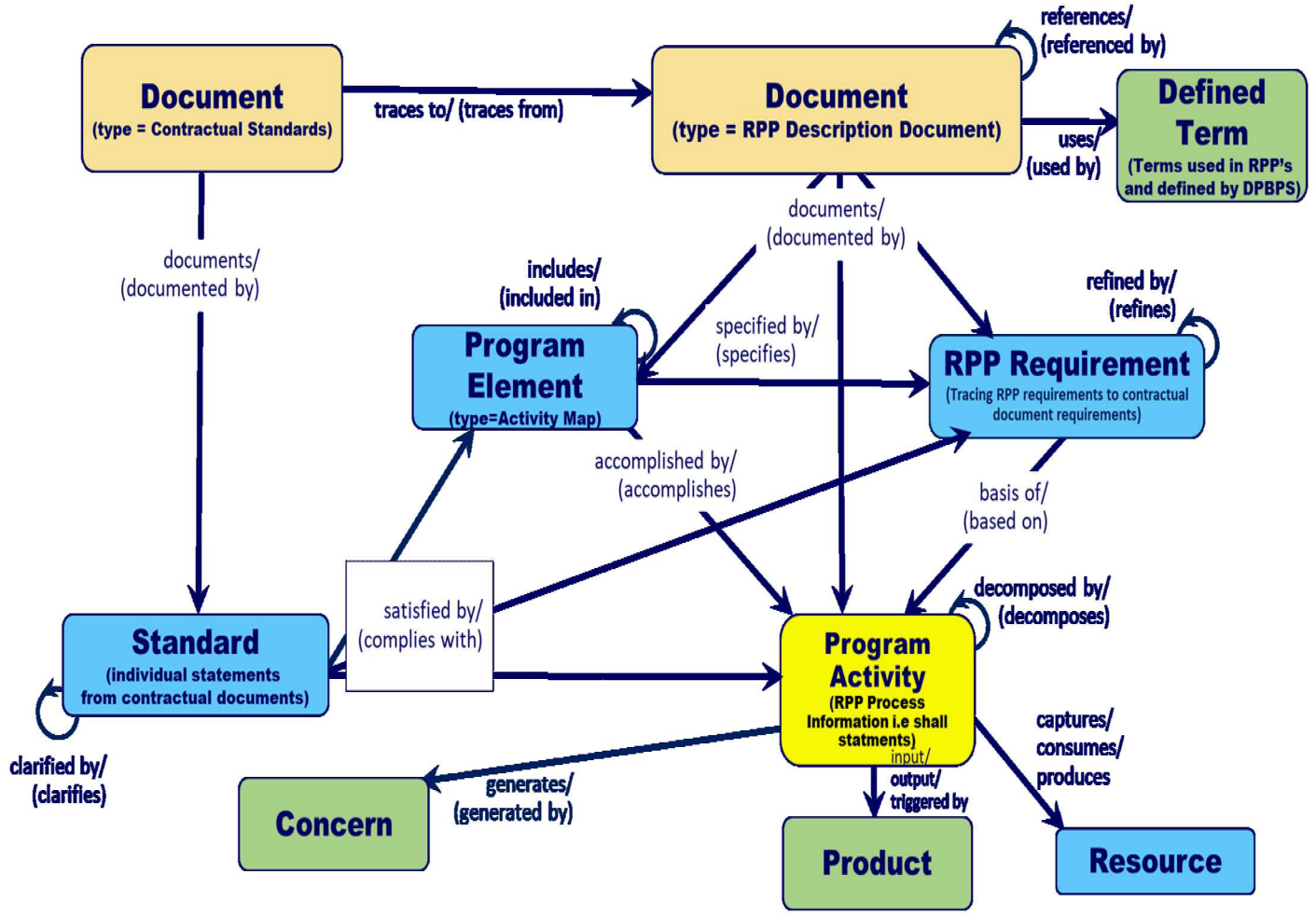
Requirements

Programmatic Processes

Document Artifacts

Stakeholders





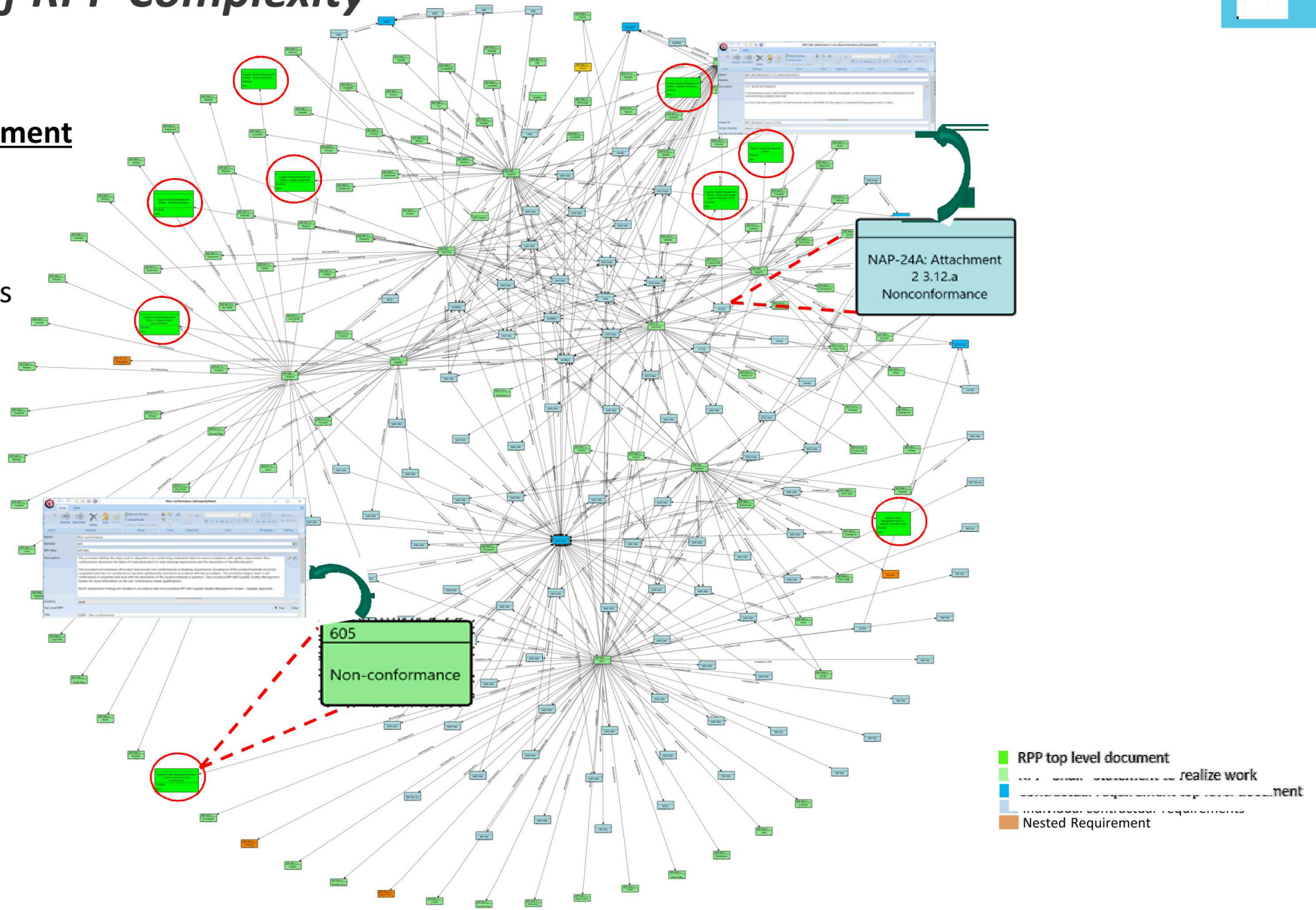
Schema for modeled information

Visualization of RPP Complexity

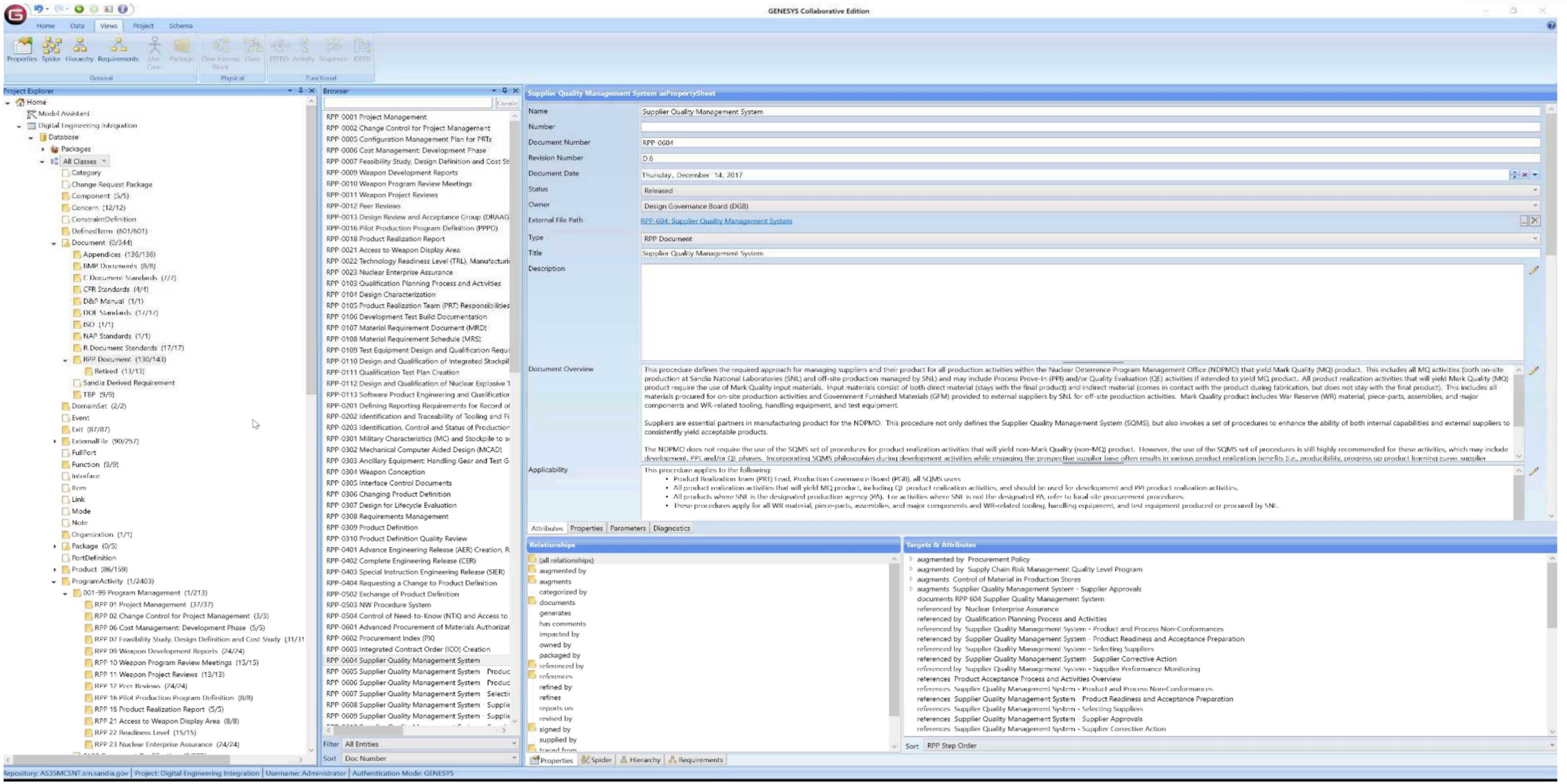
Supplier Quality Management System

Comprised of:

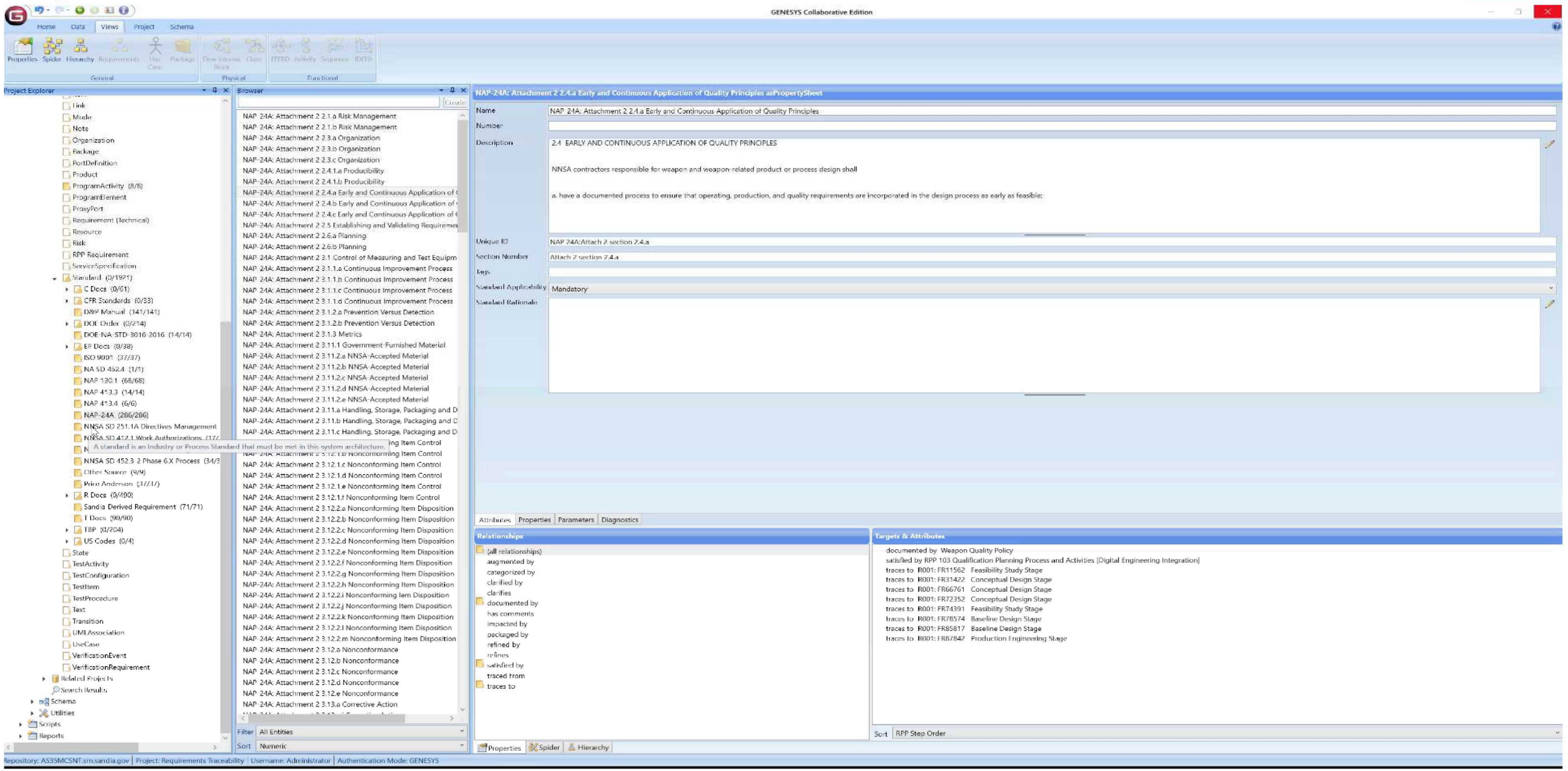
- 9 Procedures
- 8 contractual documents
- 180 requirements



Document Modeling

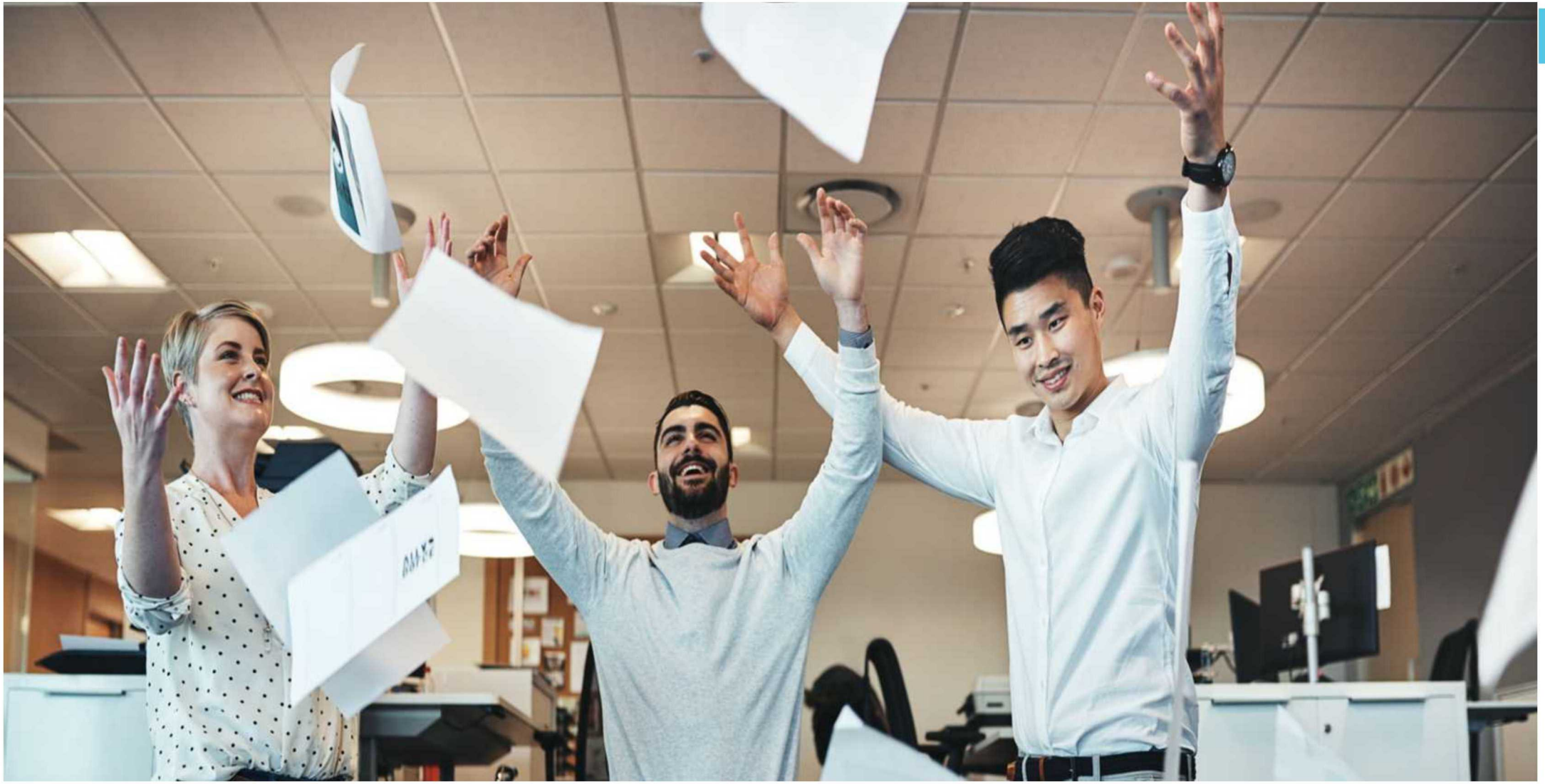


Requirements Modeling




efficiency


Manage the model not the artifact!



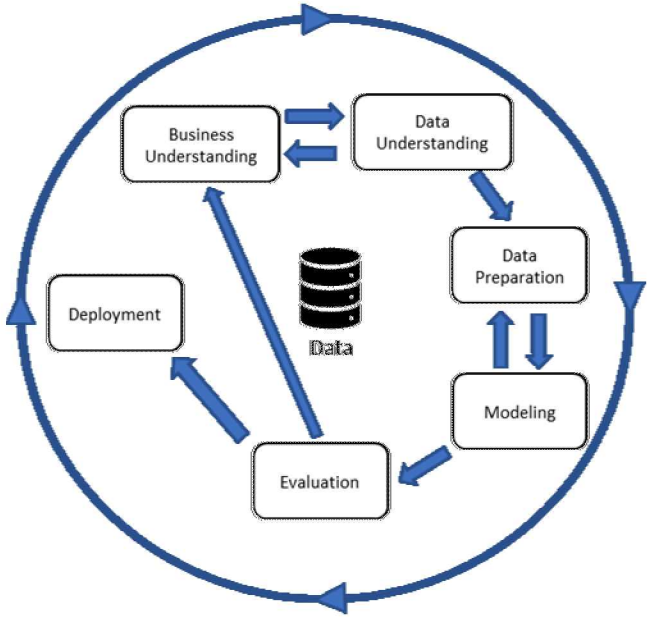
Thank You!

Topic Discussion (15mins)

Back-up Slides

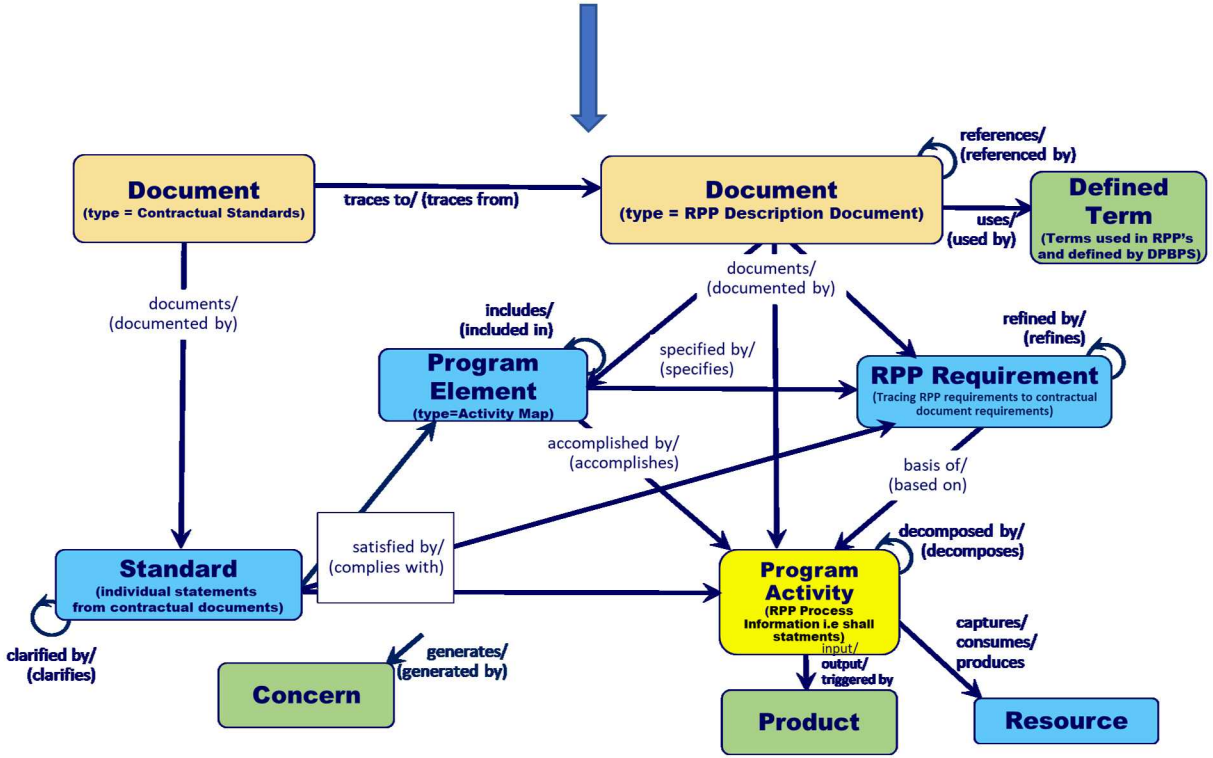
NW Engineering Process Modeling

MBSE Project Approach

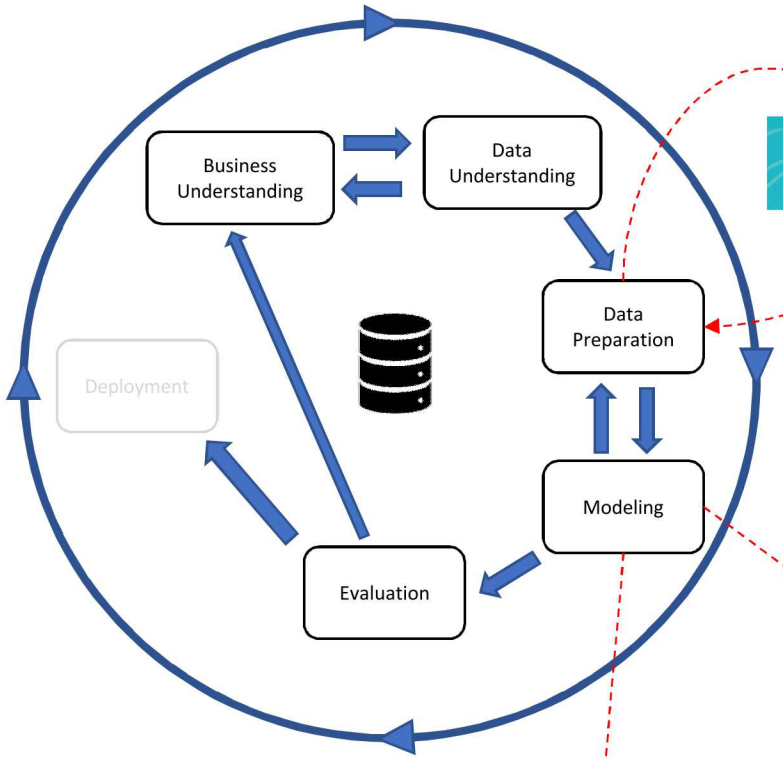


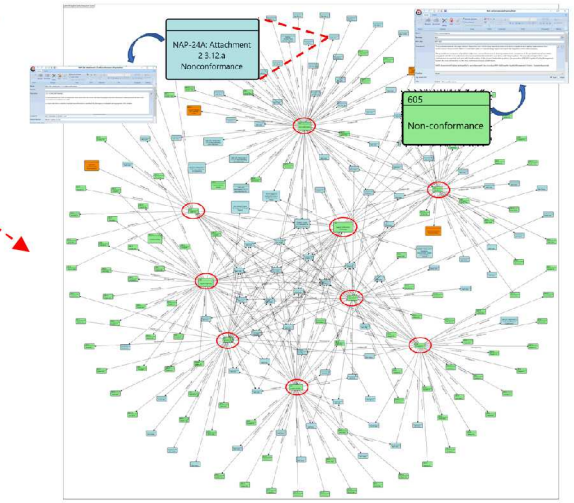
Cross Industry Standard Process for Data Mining (CRISP-DM):
a methodology that provides a structured approach to data mining.

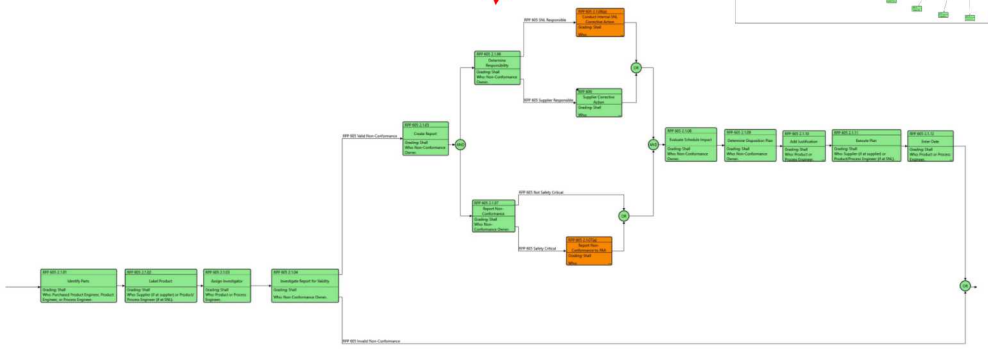
- NW Engineering Process Modeling
- Requirements Traceability
- Text Analytics



NW Engineering Process Modeling







The project focuses on RPSS process improvement cornerstones:

- Understanding and improving the current system
- Visualizing interactions and system complexity
- Identifying process areas of redundancy and/or gaps
- Building efficiencies in how documents are managed

What Worked:

- Creating a foundation for the future
  - Understanding cause and effect of cycle time reduction efforts
  - Understanding, quantifying, and communicating risk
  - Building efficiency into the SNL site impact analysis process
  - Visual, modular, and model-based engagement with PRTs, improving the end user experience
- Document modularity to enable flexibility in content delivery.
- MBSE Digital Twin, mirroring the functionality of the current document relational database

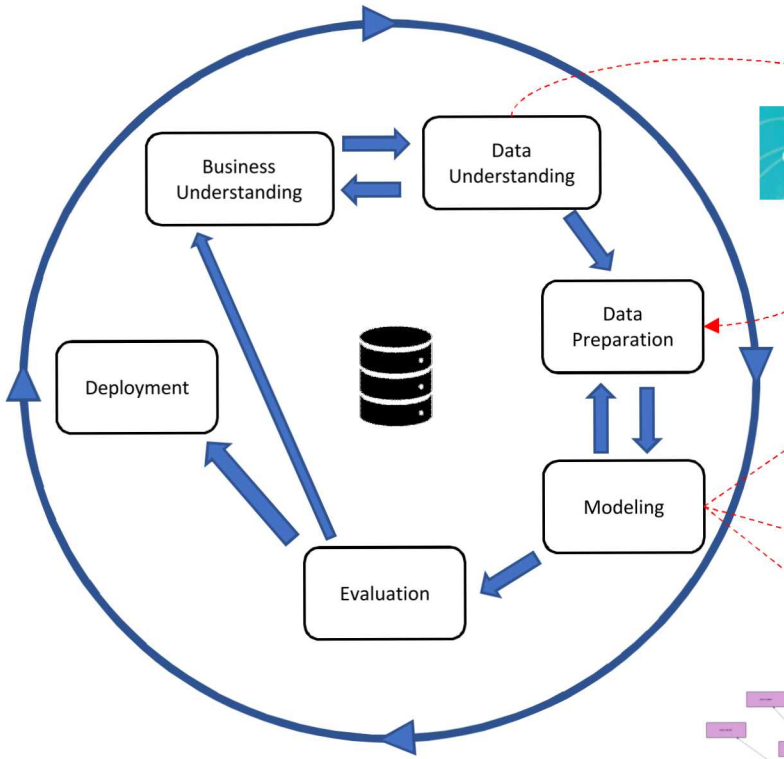
Road Blocks:

- Document “Shall” statements do not translate to Functional Flow Diagrams because they are not written in a requirement format
- Resistance to evolve/modernize programmatic documents from a document centric to a model based approach

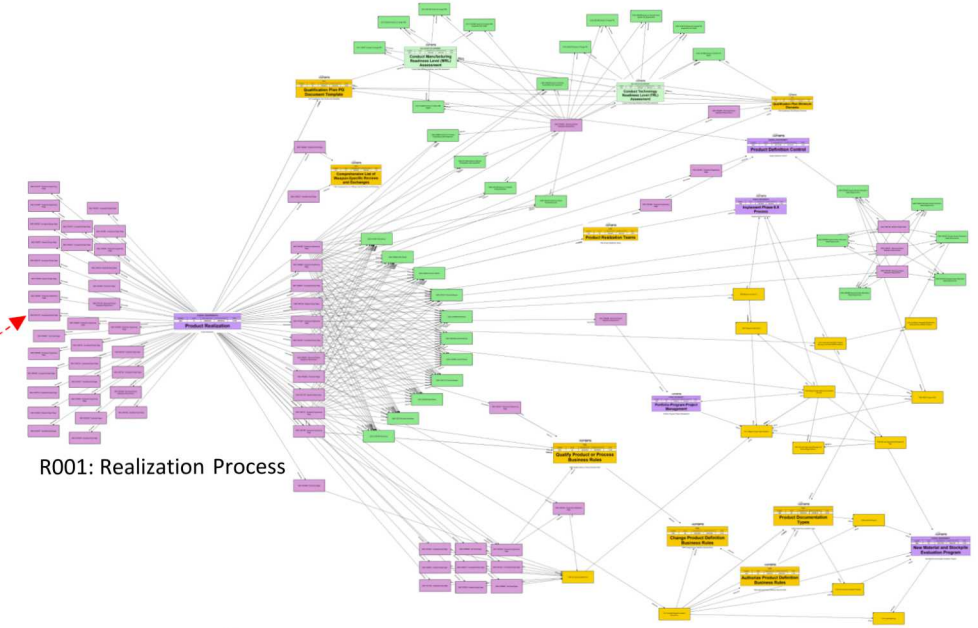
Improvement Opportunity:

- Rewrite document “shall” statements to conform to a requirement standard (e.g. ANSI/IEEE Guide to Software Requirements STD 830)
- Leadership MBSE support

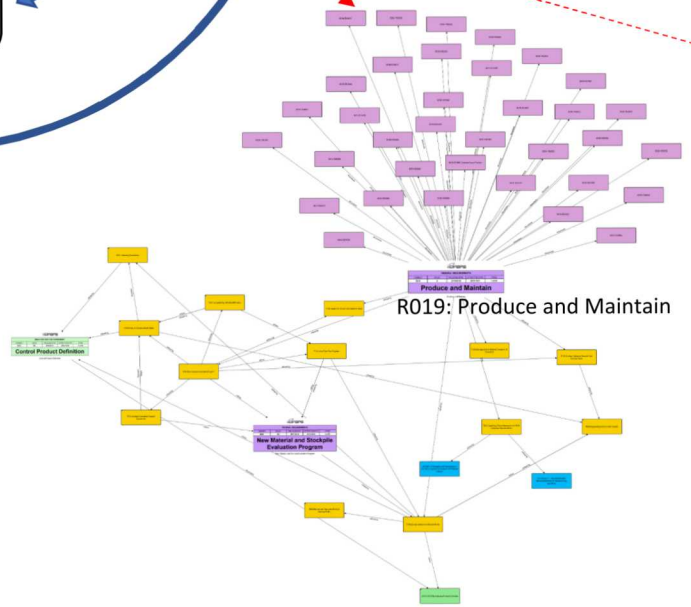
Requirement Traceability



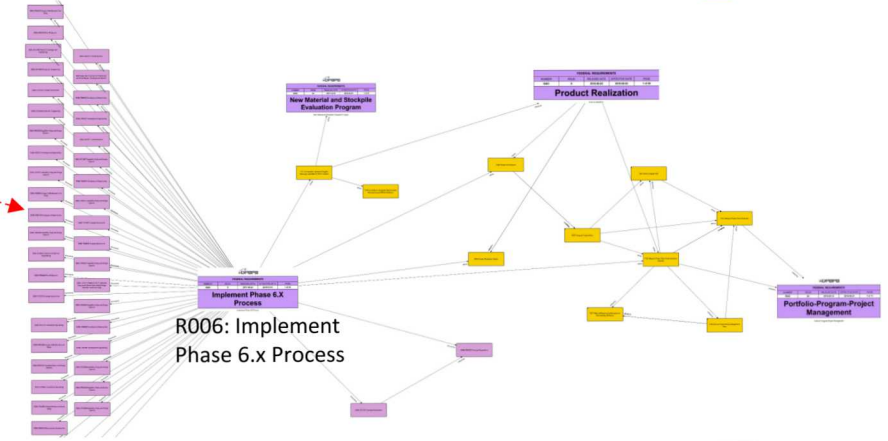
alteryx The Thrill of Solving



R001: Realization Process



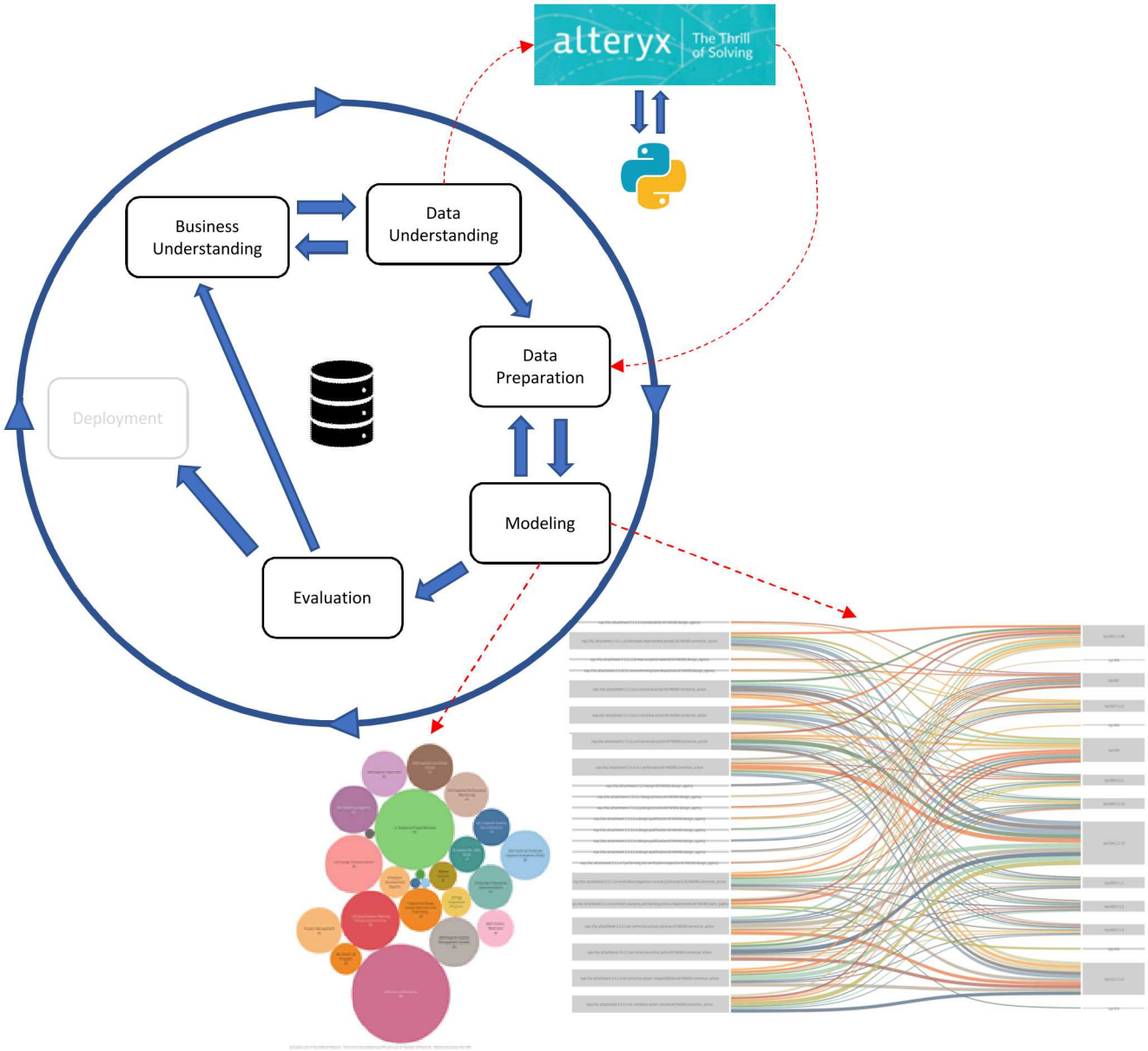
R019: Produce and Maintain



R006: Implement Phase 6.x Process

R-Docs
C-Docs
T-Docs
DOE Reqs.

Text Analytics



Project focuses on the quality of data traceability

What Worked:

- Maintainability
  - By providing a means to keep data sources (PNPI/GENESYS/DPBPS) synchronized
  - Identify impacts of contractual requirements changes
    - Maintainable
    - Verifiable
- Data parsing of RPP's to provide meaningful insights (e.g.: topic, identify redundancies)
- Automated source document comparisons
  - Completeness and correctness
- Reduction in time required to perform a requirements impact analysis
- Identify quantitative vs qualitative measures
  - Implicit to explicit
  - Occurrence of specific terms and phrases

Road Blocks:

- Resistance to learn or be informed about technologies that can improve our current state

Improvement Opportunities:

- Leadership support to enable text analytics capabilities to leverage technology for better decision making and data processing in a cost effective way.

Process Modeling Software Eco-System

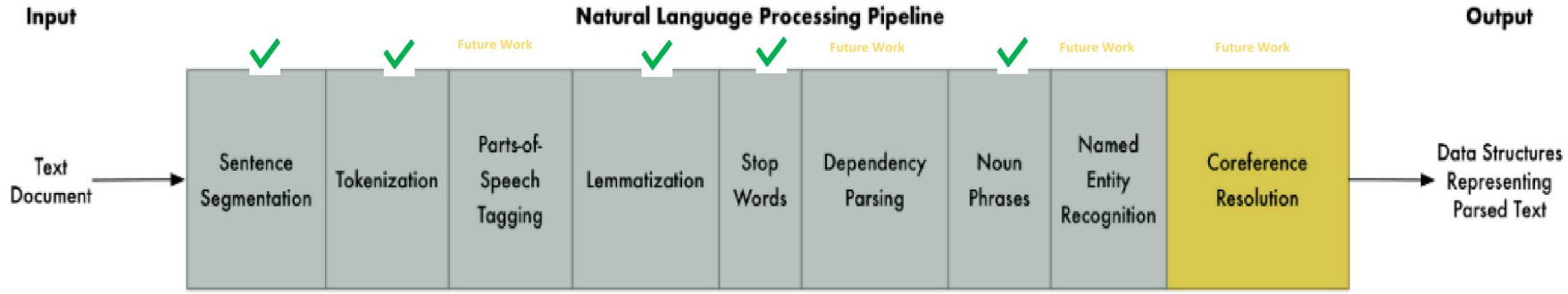
	Structured Data	Unstructured Data
Characteristics	• Pre-defined data models • Usually text only • Easy to search	• No pre-defined data model • May be text, images, sound, video or other formats • Difficult to search
Resides in	• Relational databases • Data warehouses	• Applications • NoSQL databases • Data warehouses • Data lakes

GENESYS
alteryx The Thrill of Solving
python
+ableau

'What if' scenarios based on user requests
- Why?: To keep the system relevant to the way TA's perform work.
- How?: By implementing a software eco-system that enables rapid application development, testing, and deployment

Track changes between data sources
- Why?:Changes are inevitable; Access to accurate and timely information
- How?: Implementing processes to identify differences between data sources and data-syncs.

Automatically combine data into comprehensible reports for TA's
- Why?: Improve efficiency, accuracy, repeatability
- How?: Through the use of tools and processes to combine information in lieu of the existing manual process.



What is:

Alteryx? An analytical tool the enables data blending, discovery, preparation, and analysis of structured and unstructured data.

Tableau? Visual data representation for interactive data exploration

GENESYS? A tool that enables MBSE functionality through integrated system models that capture the critical interrelationships within the system and across the system design process.

Text analytics? Text analytics is the process of converting unstructured text data into meaningful data for analysis for business intelligence, exploratory data analysis, research, and investigation to support fact based decision making.