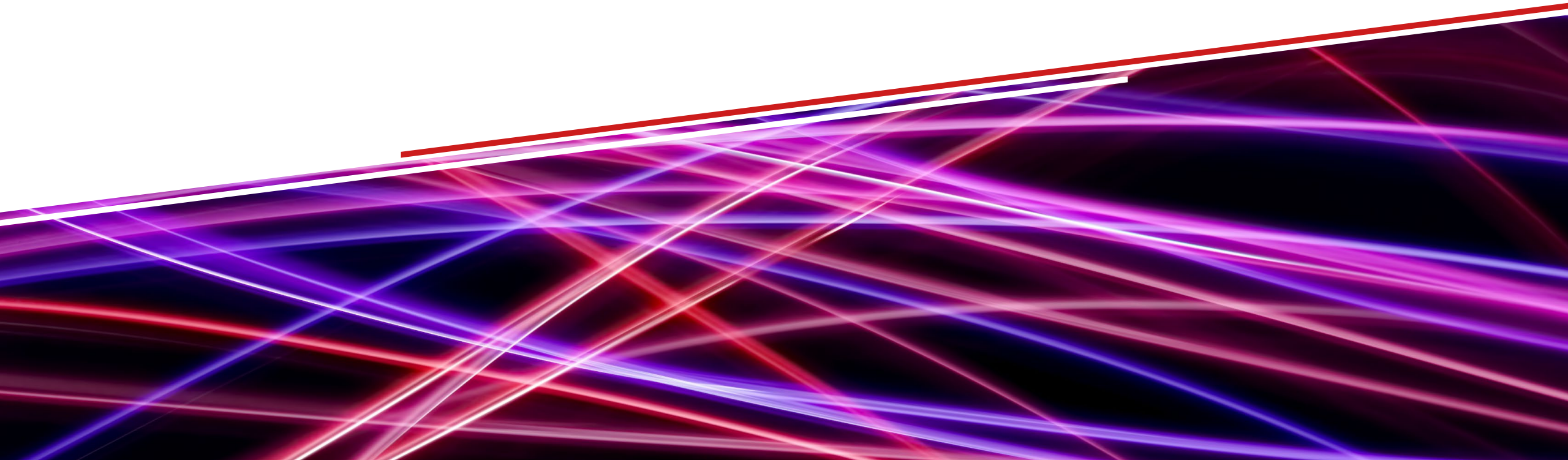
ACE2024

Building the Digital Engineering Backbone

Jake Donovan and Chad Grubb

March 5th, 2024



ReadyOne

BUILDING THE DIGITAL ENGINEERING BACKBONE

Jake Donovan
Digital Engineer

Chad Grubb
Principal Digital Engineer

Engineering Innovation Factory

SAIC®

Table of Contents

Abstract Overview

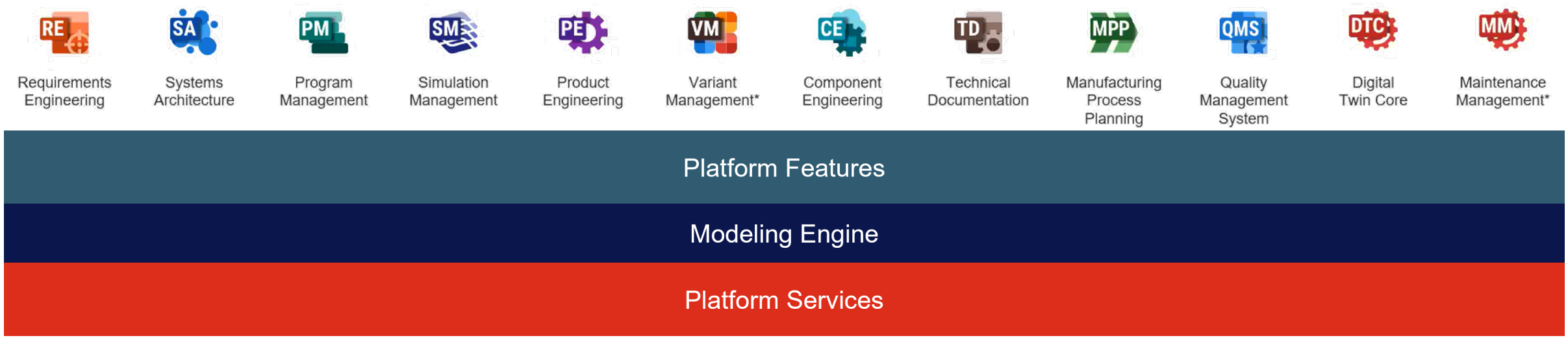
- In this presentation we will be giving a high-level overview on how our Aras data model handles the digital engineering lifecycle. Specifically, we will be focusing on requirements as a top-level item and how data moves down the thread from there. We will then be stopping to dive into the use of our Project Access solution, and how it allows for database consolidation and separation. Finally, we will explore release management and the ways it helps us succeed.

- Successful DE needs good data management and configuration management
- ReadyOne uses Aras Innovator to maintain a strong DE backbone
  - Configured and customized to fit the digital engineering world in DoD
- SAIC utilizes Aras Innovator to connect each source of truth and keep a continuous digital thread throughout the digital engineering lifecycle

Data Model

SAIC ENGINEERING
Innovation Factory

Aras Data Model



Succeeds At:

- Great at PDM
- Basic Digital Engineering
- Maintain a single source of truth

Needs Improvement:

- Full Digital Thread connectivity
- Maintaining several different sources of truth
- Supporting a Digital Engineering Ecosystem

SAIC Data Model

Goals:

- Upgrade existing Aras Innovator capabilities
- Build new solutions on top of the out of the box data model
- Support a Digital Engineering Environment

Key Factors:

- Custom
- Aligned with DoD Digital Engineering strategy
- Controllable
- Agile

Layers of Data Model

ReadyOne Ecosystem

=

SAIC Data Model

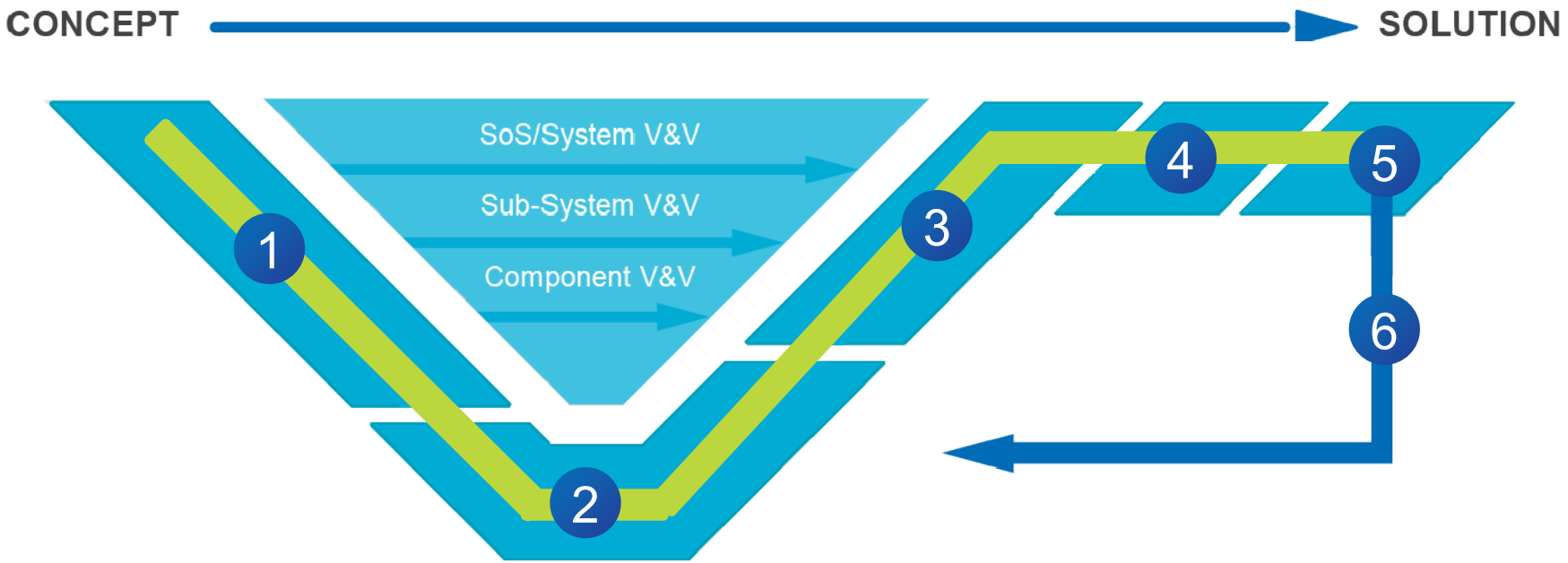
+

Aras Data Model

Requirements

SAIC ENGINEERING
Innovation Factory

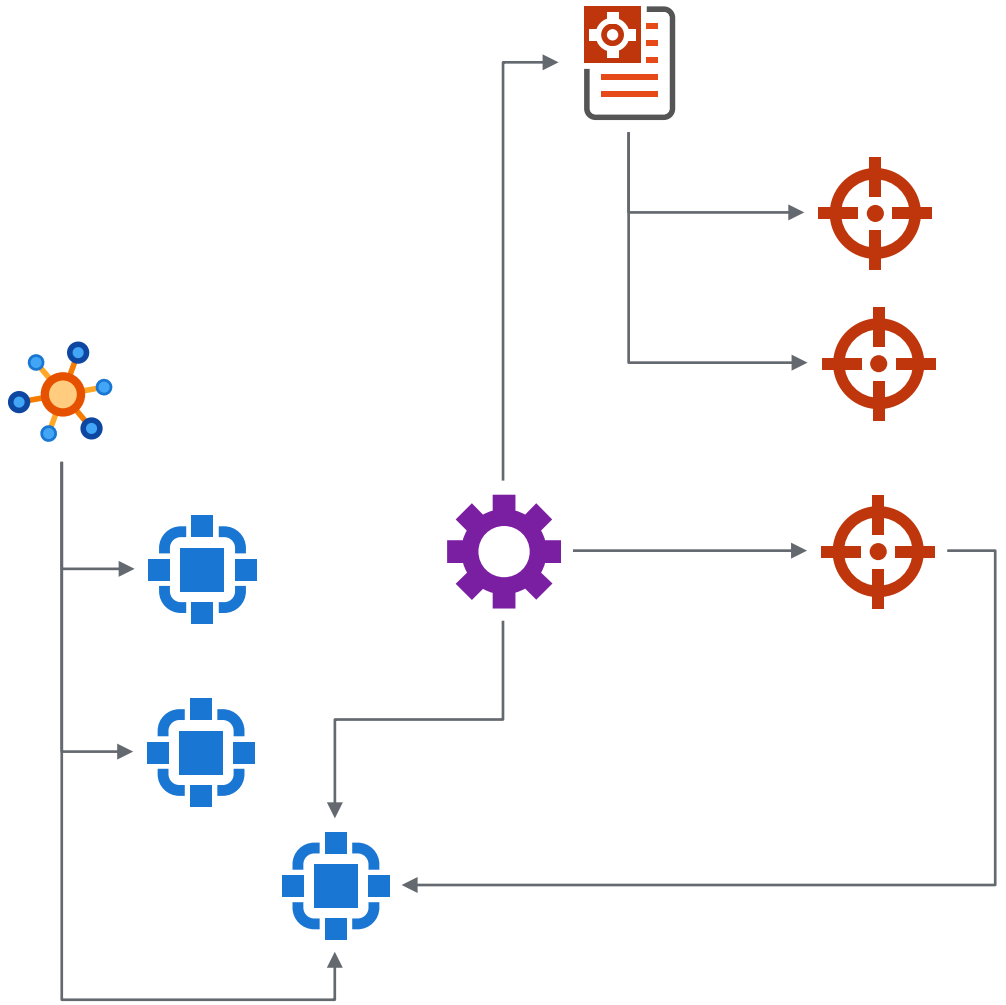
Data Model Application



- Digital Thread Platform: Aras Innovator
- Rapidly Deployable Digital Engineering Ecosystem: ReadyOne
- 1 Digital Architectures and Requirements Engineering (DARE)
- 2 Engineering Design and Development
- 3 Modeling, Simulation, Analysis, and Prototyping
- 4 Production and Manufacturing
- 5 Model-Based Product Support
- 6 Digital Twin

Requirements Data Model

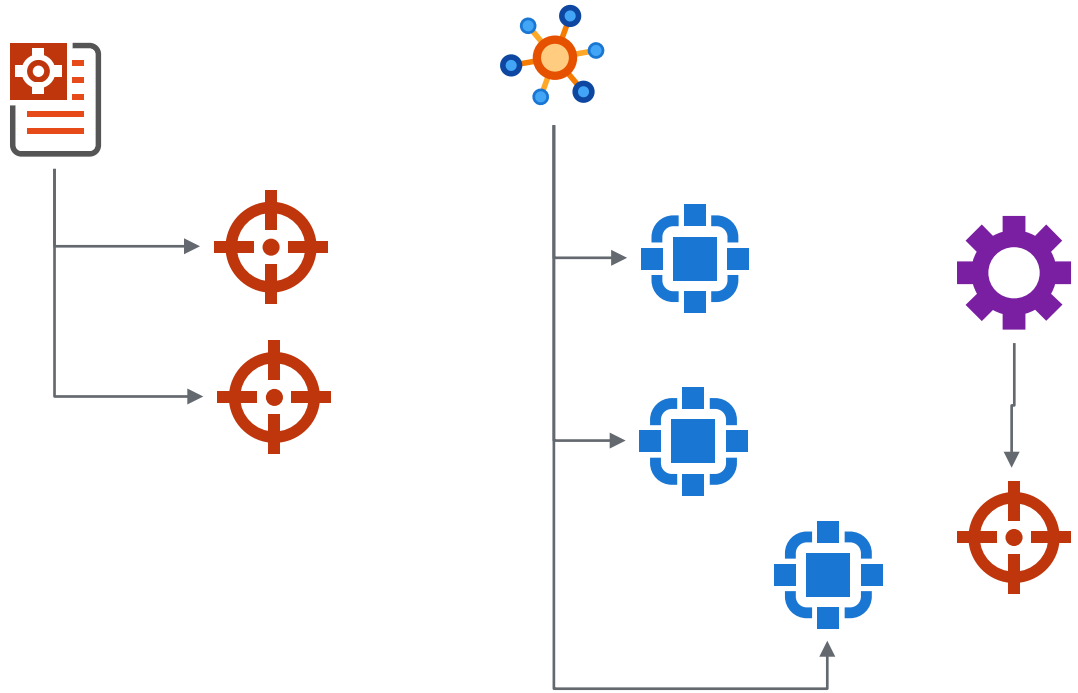
- Requirements and requirement documents exist as children of parts
- System elements and models fit awkwardly into the digital thread
- Multi level relationships exist
  - Parts can be related to both requirement documents and requirements



Requirement Upgrade

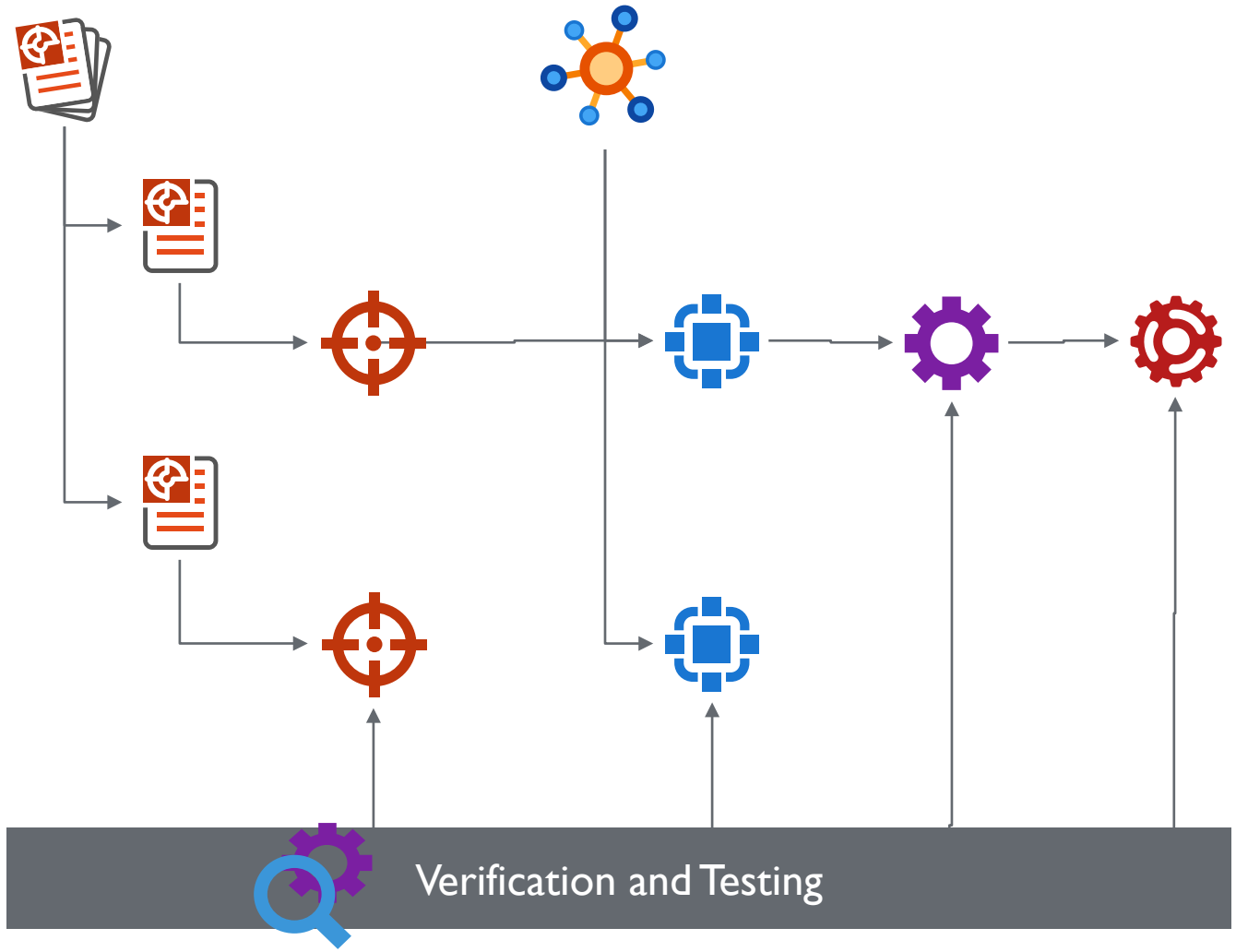
GOALS

- Defined from our Ontology
- Requirements based data model
- Logical structure
- Simplified forms
- Custom attributes
- Well thought out relationships



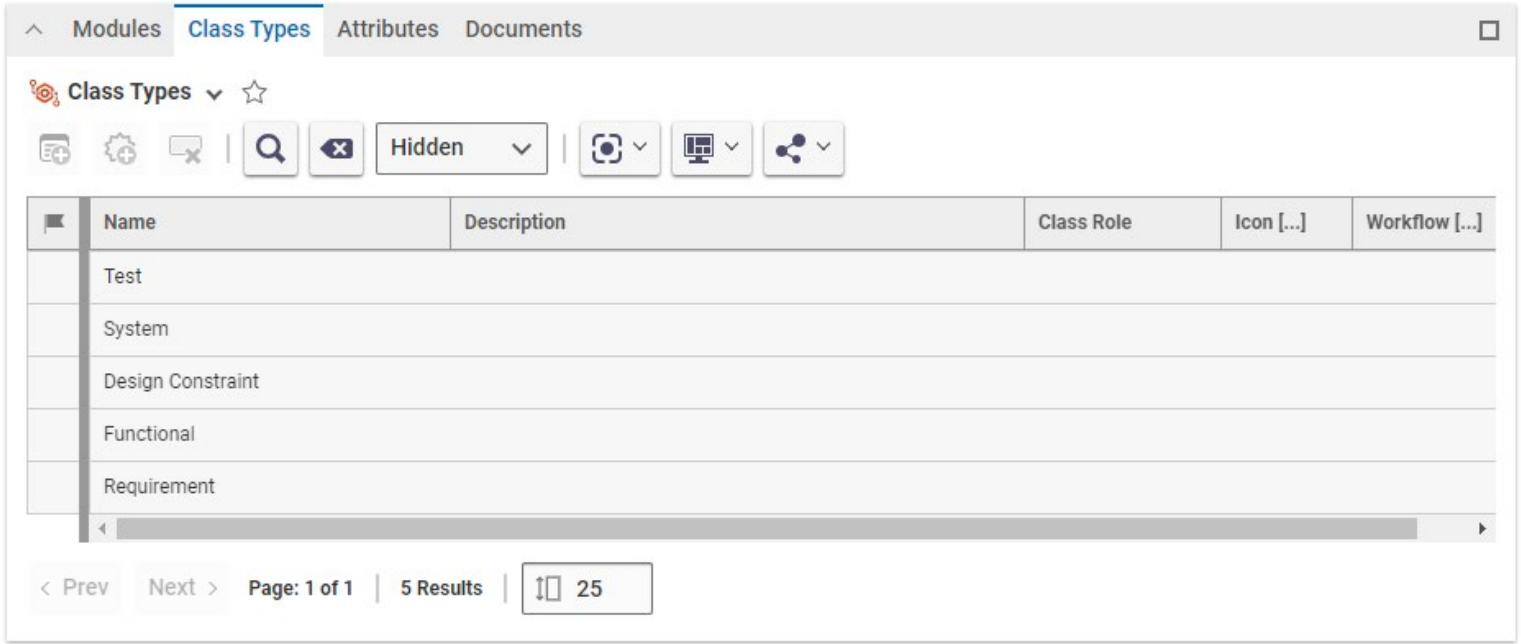
Requirements Data Model

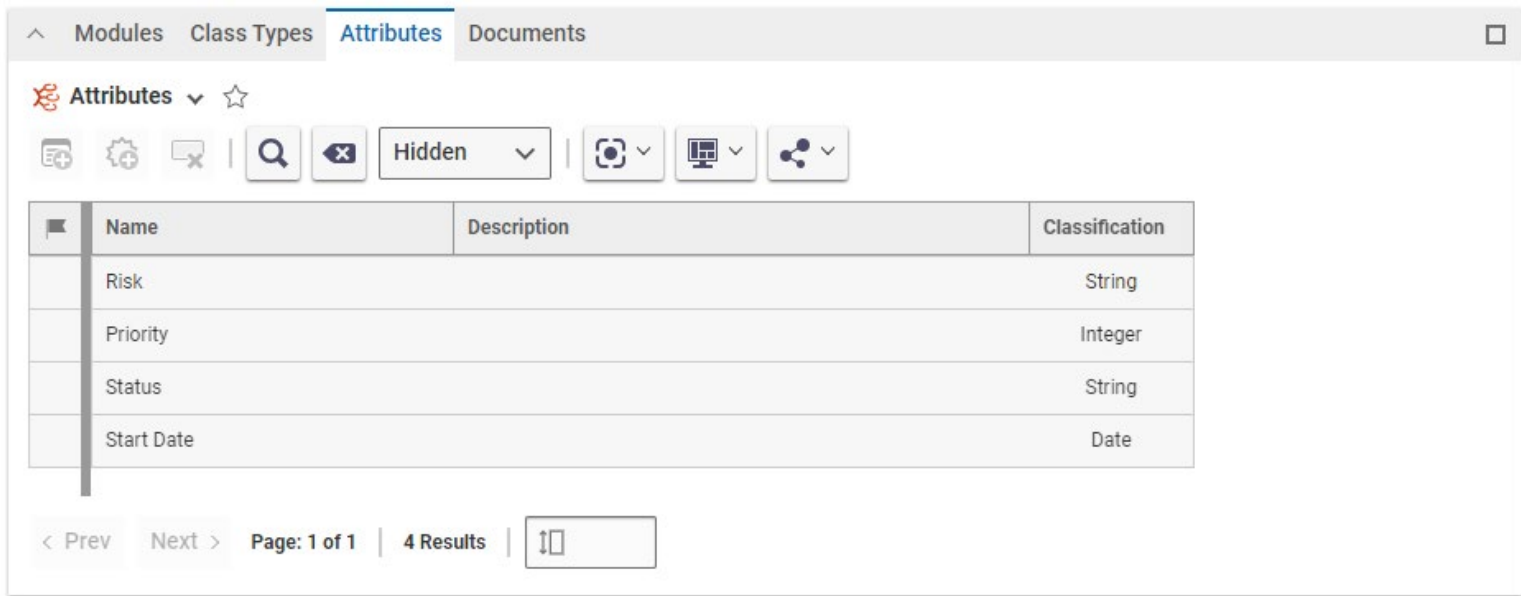
- Requirement's structure is updated
  - Project owns modules
  - Modules own requirements
  - Requirements are satisfied by parts or system elements
- Traceable digital thread
- Data flows in one direction



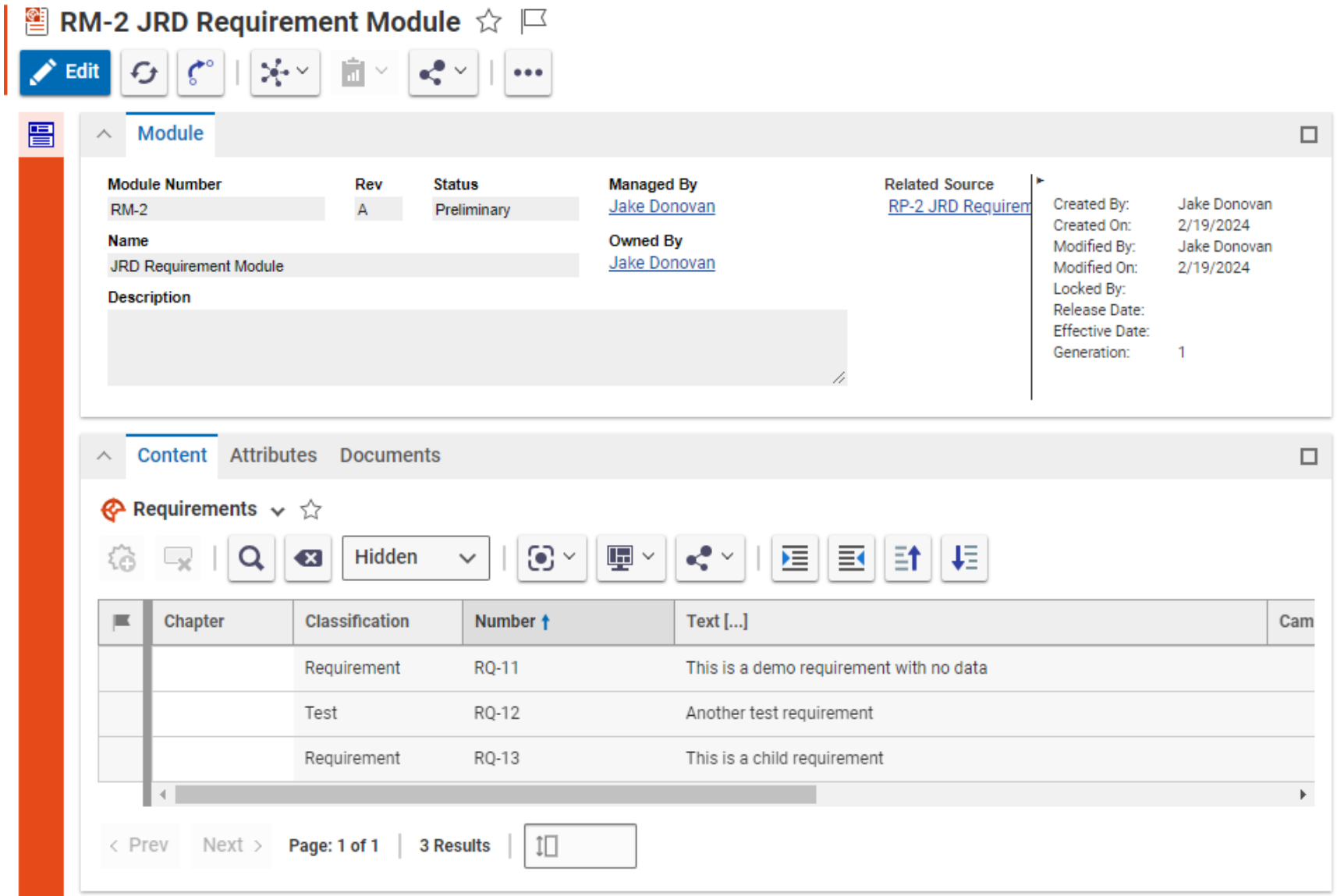
Requirement Projects

- Container for requirement modules
  - Allows you to associate modules together for better understanding.
  - Mirrors DNG to help transition and connect to the software with minimal mapping changes
- Defines the class types allowed for the requirements within the project
- Lists the possible attributes that will need to be associated with the requirements





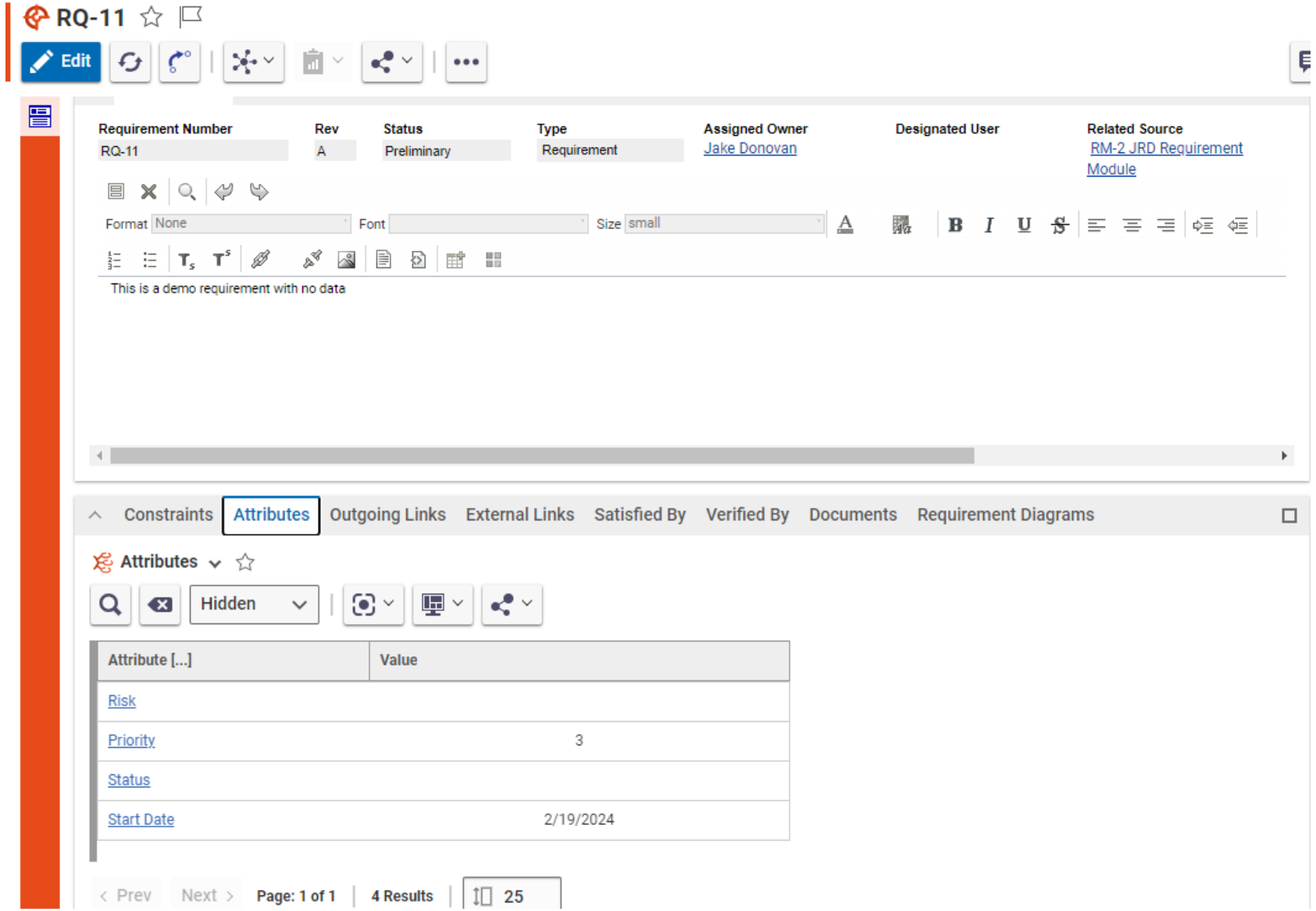
Requirement Modules



- Container for requirements specific to that project and module
- Allows for more descriptive breakdown
- EX:
  - Project: Car
  - Module: Brakes

Individual Requirements

- Simplified form with only the crucial data for user understanding
- Only essential relationships included

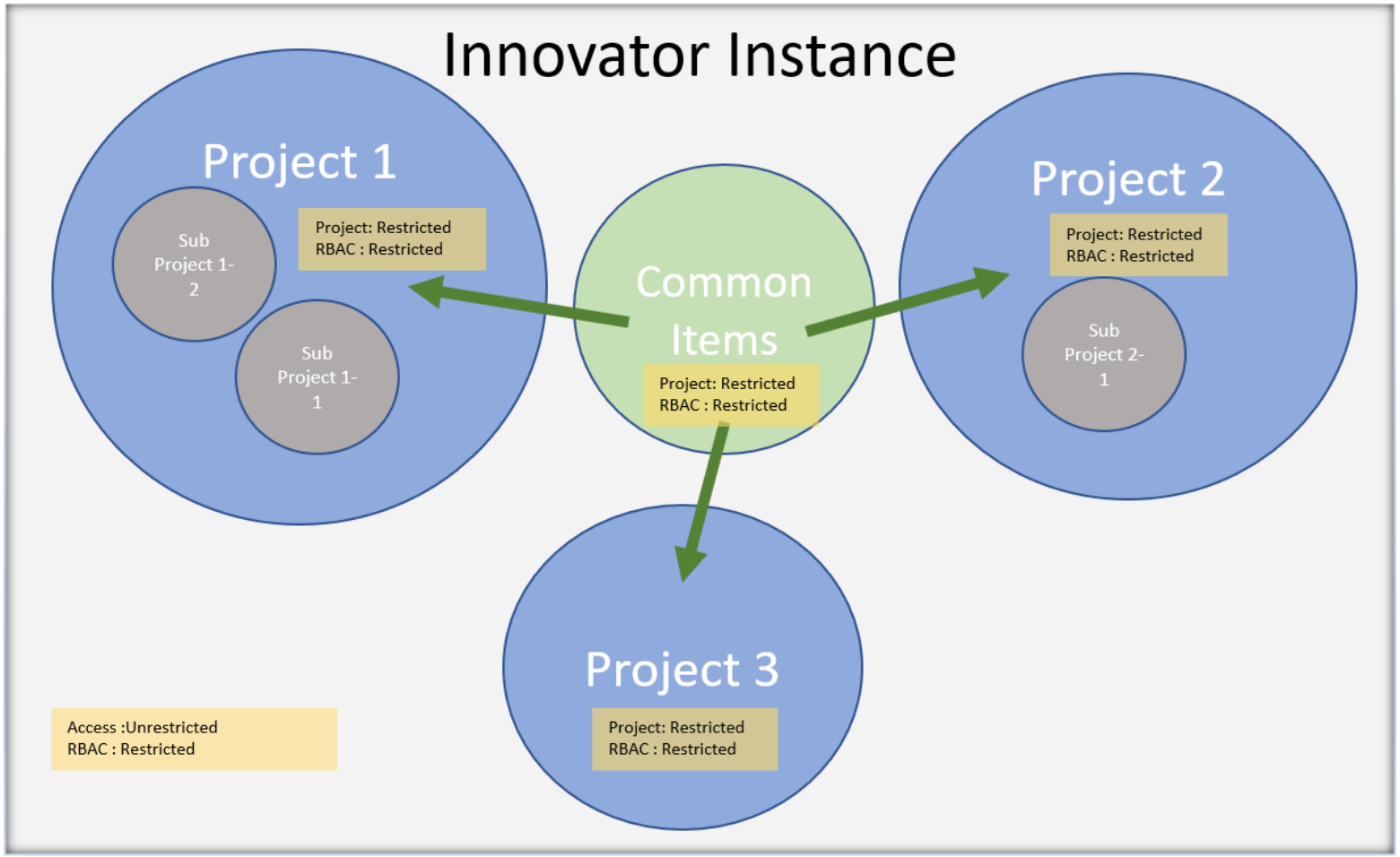


Project Access

SAIC
ENGINEERING
Innovation Factory

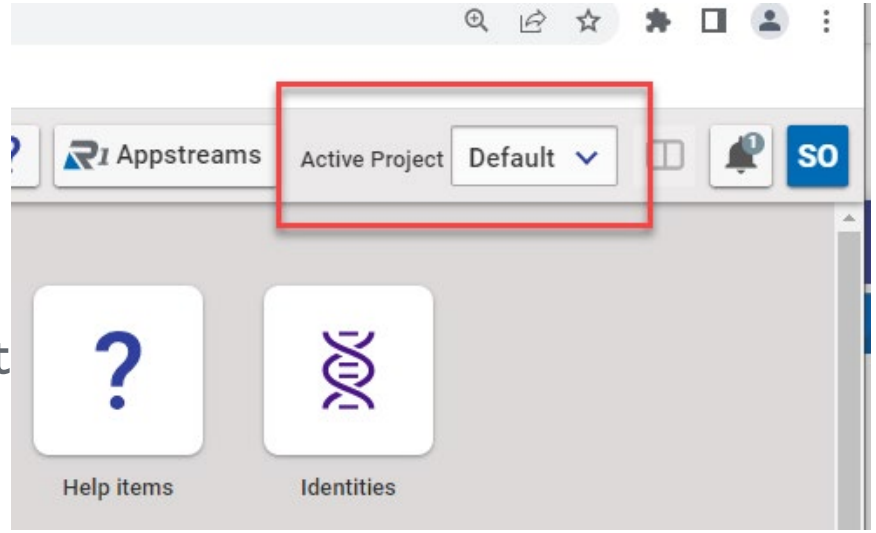
Project Access Purpose

- Enable the ability to isolate program-specific data from within a common Innovator instance so that users can only access data in which they have been given access to.



Summary of Basic Functionality

- No controlled items can be created if the User's selected "Active Project" is set to "Default"
- New, controlled items, will be automatically assigned to the User's selected "Active Project"
- If an item is controlled under another project that is not in your "Active Project" dropdown, you will be unable to see it or access it.
- All Users can see items in the "Common Items", but cannot edit them unless they are part of the project
- All users are assigned to a "Default" project upon creation so that they can receive minimal project access rights.
- Users with Administrator privileges are exempt from the Project Access rules



Features

- All users should be able to be assigned to any identified (controlled) item type and access should be controlled to members of said project.
- Users will have access to Get/Discover any item assigned as a "common item"
- All Users should be able to be assigned to a project
- Access rights should be maintained and controlled through MACPolicy implementation
- Enable the ability to assign specific ItemTypes to project access assignments
- Instances of a ItemTypes that are being controlled by Project Access must be controlled and identifiable

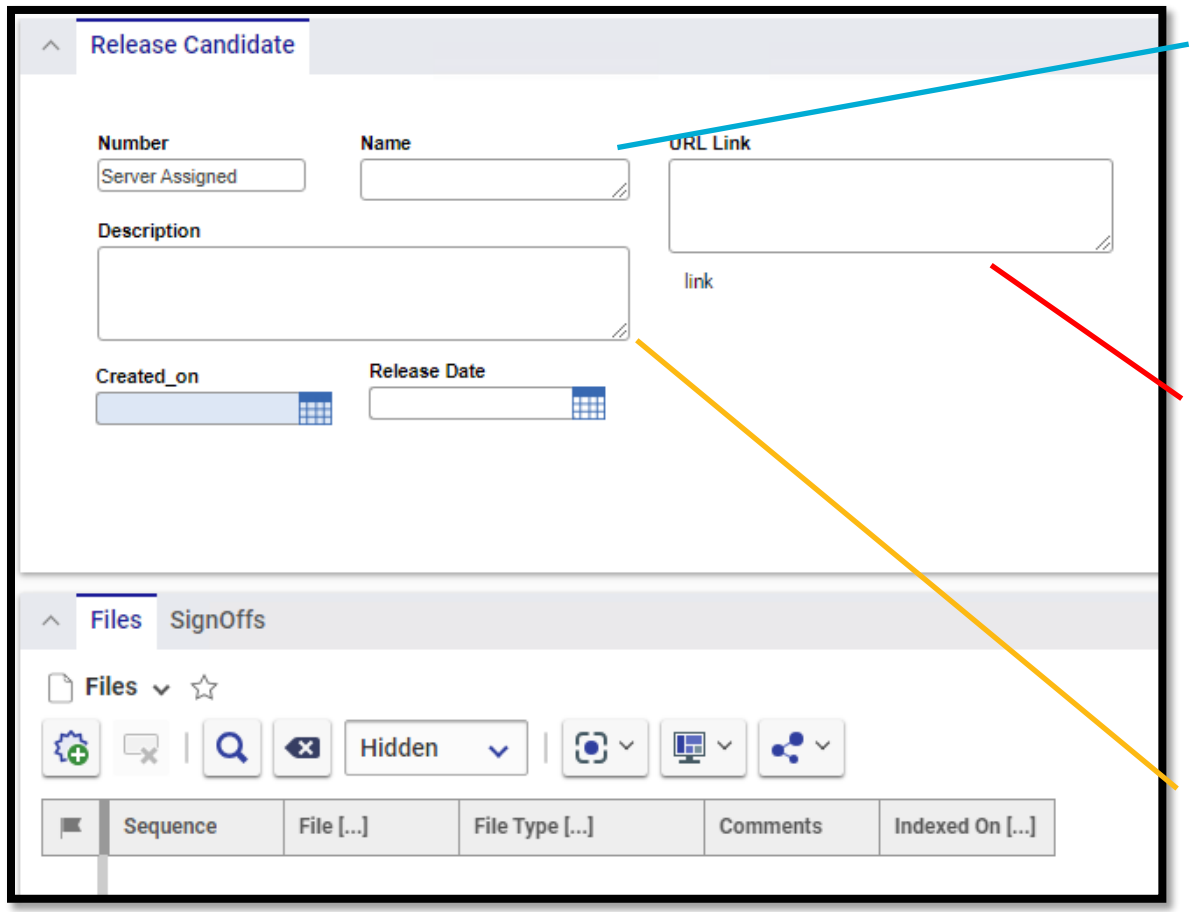
Release Management

SAIC
ENGINEERING
Innovation Factory

Release Management

- Release management is a request platform to increase transparency active projects on a database
  - Request is created to add in a project, upgrade, etc.
  - This would allow us to track and create user stories in ADO and link it
  - Keep discussion history with customers and other people within release candidate
- Allows a release candidate to quickly be approved and deployed after testing is complete
  - Release candidate can be a hotfix for quick release or go through the appropriate offering manager approval steps
  - Creator of the release candidate can stage after offering approvals
  - Quick release given a small group of offering managers and engineers and allows for notification and signoffs at each activity
- The release candidate can be a plugin, Aras software, a connector, an update, etc.
- Provide a list of all possible upgrades to database

Form Layout



Name

Name of release candidate

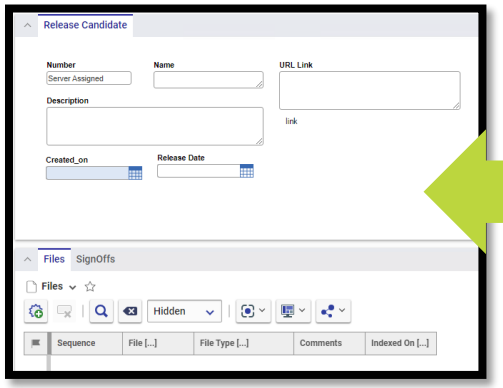
URL Link

Active link to version control

Description

Necessary information to describe what is in the package and what offerings are affected

List of Release Candidates



My InBasket | Release Candid...

Release Candidates

Search | Clear | Simple | Default *

Name	state	Description	URL Link	Release Date [...]	Number
Plugin Release	In Review	Interface between program A and pro...	http://localhost/R3...	Friday, February 16, 2024	rm_1001
Project Updates	In Review	Updates to project A	https://ado.readyon...	Thursday, February 22, 20...	rm_1003
SAIC Enterprise Update	Staging	SAIC Enterprise Updates and additions	http://localhost/R3...	Tuesday, February 27, 2024	rm_1004
SAIC Offering Update	Start	SAIC Offering Update Number 4	https://ado.readyon...	Saturday, February 17, 2024	rm_1005
Connector Example	Deployed	ADO Connector to Aras	http:/R3ADY1DEV-A...	Thursday, February 22, 20...	rm_1002

Release Management Advantages

ADVANTAGES

- A Release Candidate package can be deployed within the same day
- A list of all release candidates will be recorded within Aras and can be viewed anytime
- A small group of people is needed for approvals and deployment

FUTURE TASKS

- Automated final build and deploy
- Different levels of releases

DATABASE CONSOLDATION AND SEPARATION

Allows for project to coexist in one database

Minimizes data leaks

STANDALONE SOLUTIONS

Utilizes out of the box Aras Data Model and builds on top of the existing solutions

Modular design for easy deployment

DOD FOCUSED DATA MODEL

OPEN model Based SOA with pre-configured integrations for modeling tools from all domains

Always available data, No proprietary formats

INTERNAL DATABASE RELEASE MANAGEMENT

Transparency of deployment within the database

Streamline deployment process

REQUIREMENT BASED

Realizes the true Digital Engineering lifecycle

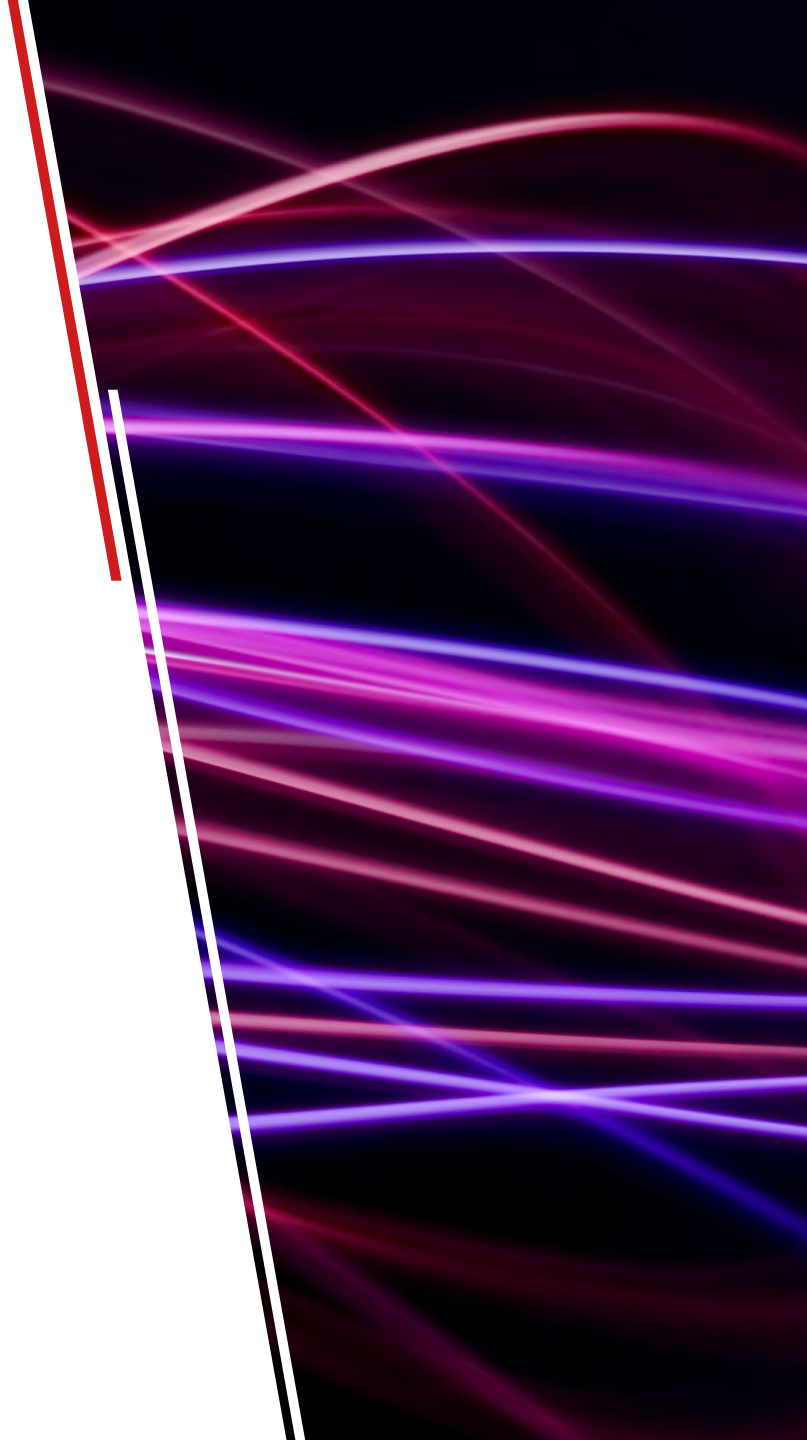
Generates a traceable Digital Thread

LIFECYCLE INTEROPERABILITY

Brings in the Engineering Vee diagram to the digital engineering environment

Digital Thread from conops to sustainment

Thank you!



ACE 2024