Policy Engineering
Applying SE to Develop Better Policies

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Outline

1. What Is a Policy?
2. How Can We Apply SE to Improve Policies?
3. How Can We Implement this Approach without Scaring Policy Makers?

1. WHAT IS A POLICY?

What's a Policy

- Lot's of definitions, but the "Business Dictionary" shows the key elements highlighted
  - Guiding principles
  - Organizational governance
- But what is it in Systems Engineering terms?

Policies in SE Terms

- Policies contain *requirements and constraints* for the organization

- Those requirements and constraints are *allocated or traced* to different parts of the organization

- Policies also frequently contain processes or procedures which are essentially implementation *scenarios*

Why not apply systems engineering techniques to analyze these policies to make sure they work prior to implementation?
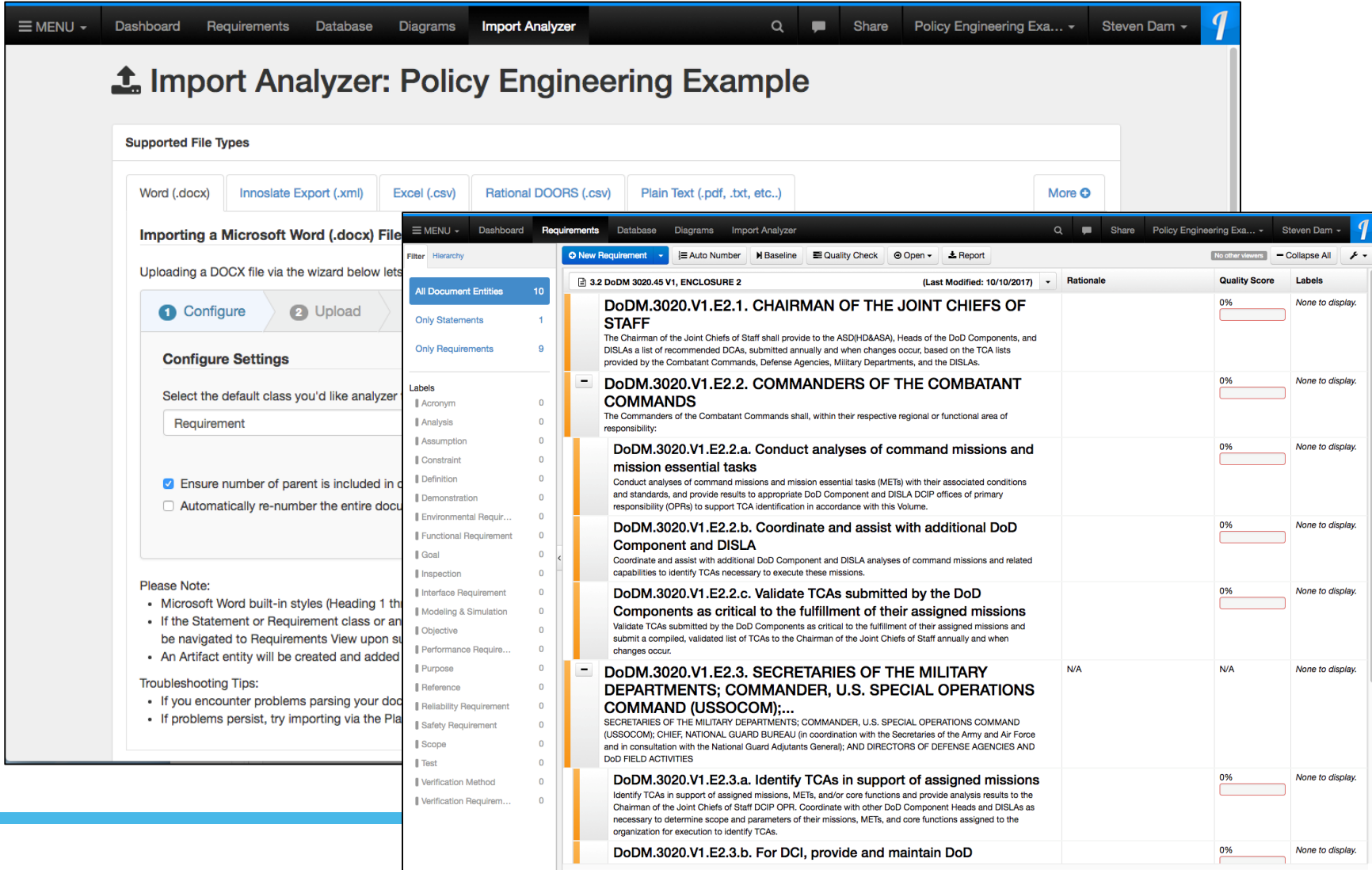
2. HOW CAN WE APPLY SE TO IMPROVE POLICIES?

Apply Requirements Analysis

- Treat the policy draft(s) as a requirements document

- Analyze for quality (clarity, completeness, etc.)

- Enhance the text using these quality criteria

- Use a "document view" for presentation to stakeholders

- Capture comments in tool and produce "comment matrix"

RA: Treat the policy draft(s) as a requirements document

- Import documents into a requirements analysis tool

- Break paragraphs into individual requirements for analysis

- Note many statements may not be written like a requirements, but still are requirements
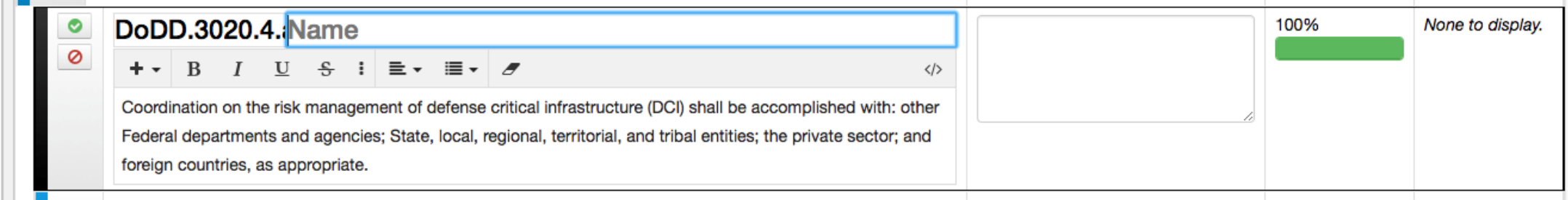
RA: Analyze for quality (clarity, completeness, etc.)

- A number of the standard quality factors apply directly to policies (clear, complete, consistent, and correct)

- Other may apply, depending on the specific policy (Design, Feasible, Traceable, Verifiable)

RA: Enhance the text using these quality criteria

- Enhance the grammar
- Simplify, where possible
- Break into separate requirements, if desirable

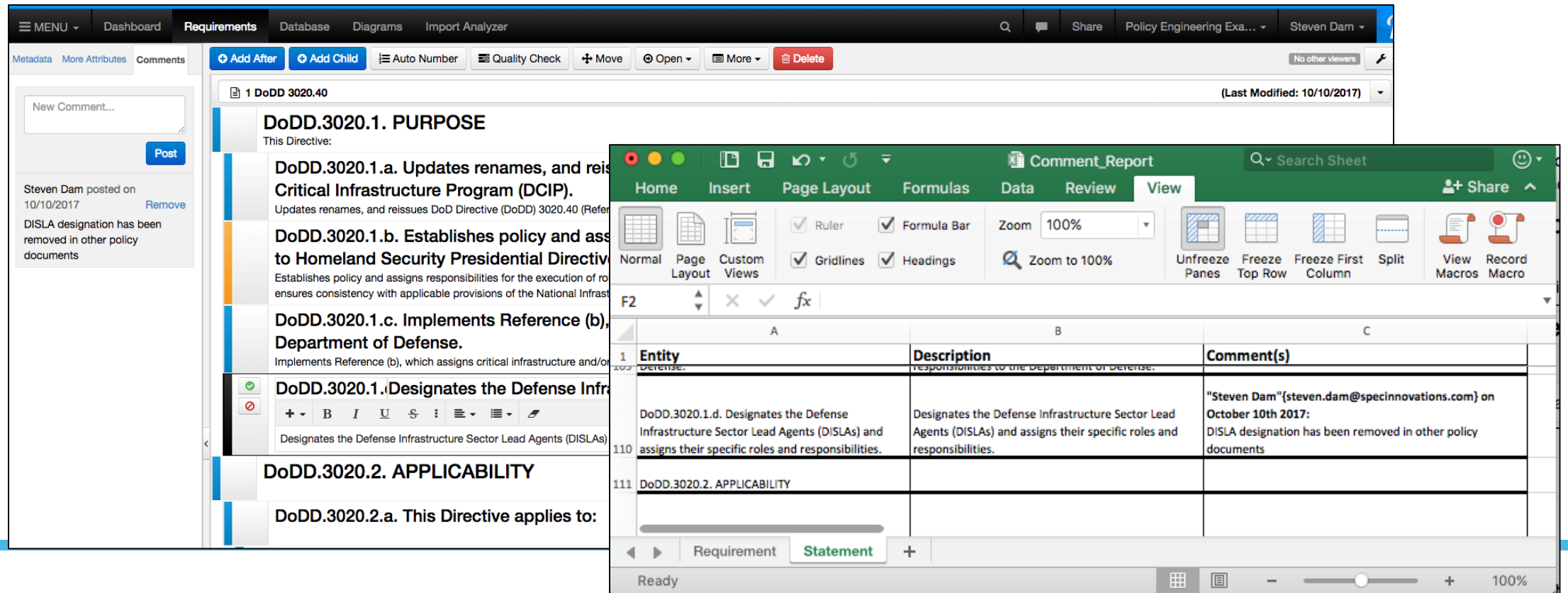# RA: Use a "document view" for presentation to stakeholders

- Hide information that may confuse a reader/viewer
  - e.g., columns with quality score, labels, other attributes
- Readers can then view it as they would a document in MS Word, but any comments and other information would be accessible at the paragraph level
- Hyperlinks can be provided to guide them to other documents

RA: Capture comments in tool and produce "comment matrix"

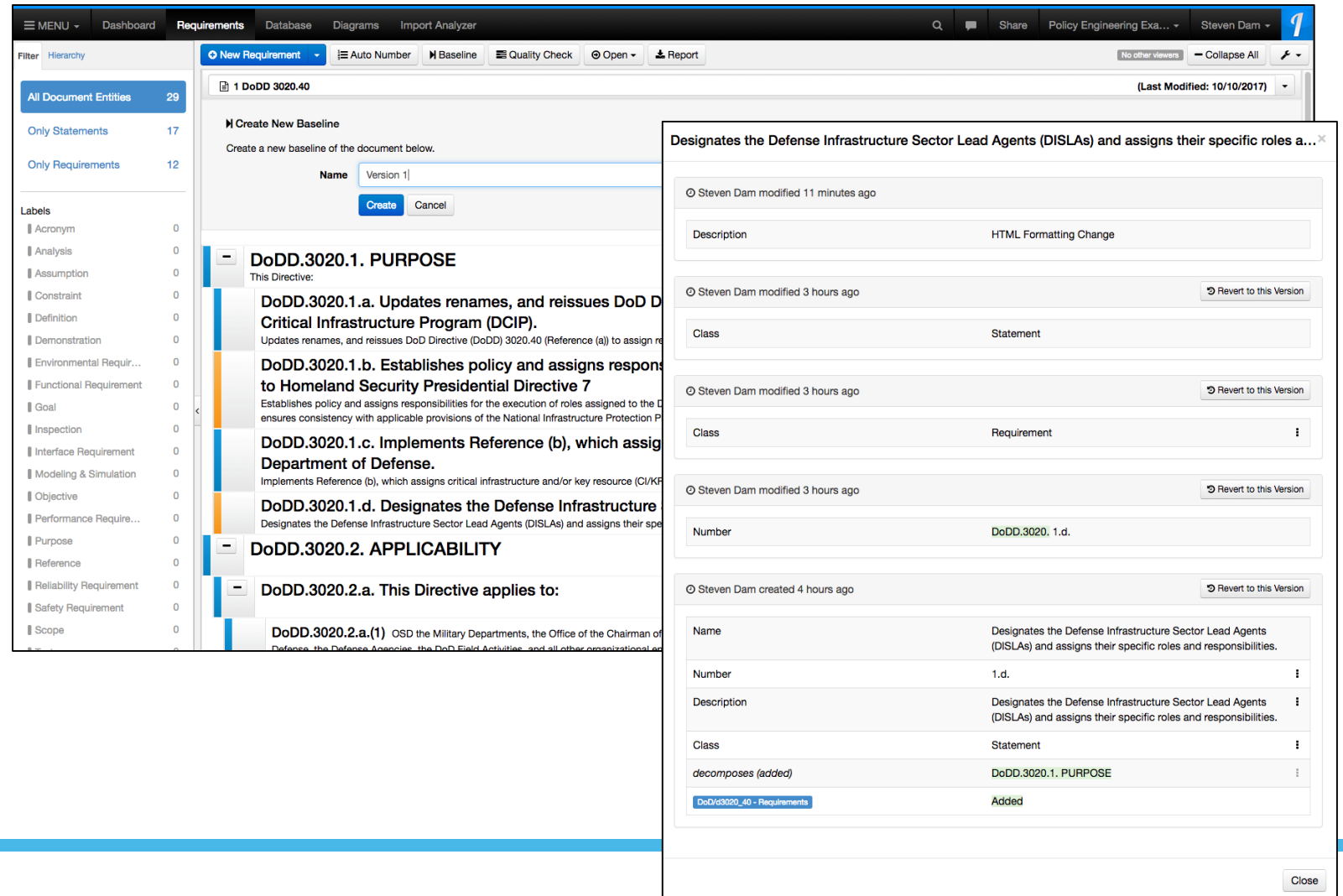- Use commenting features where available
- Special reports may be desired

Configuration Manage Policy Documents

- Baseline
- Track change history
- Branch/fork for excursions
- Store files in database

Model Processes and Procedures

- Review policies for processes and procedures
- Create a functional model
- Trace back to requirements
- Enter time distributions
- Associate costs
- Allocate to performing elements
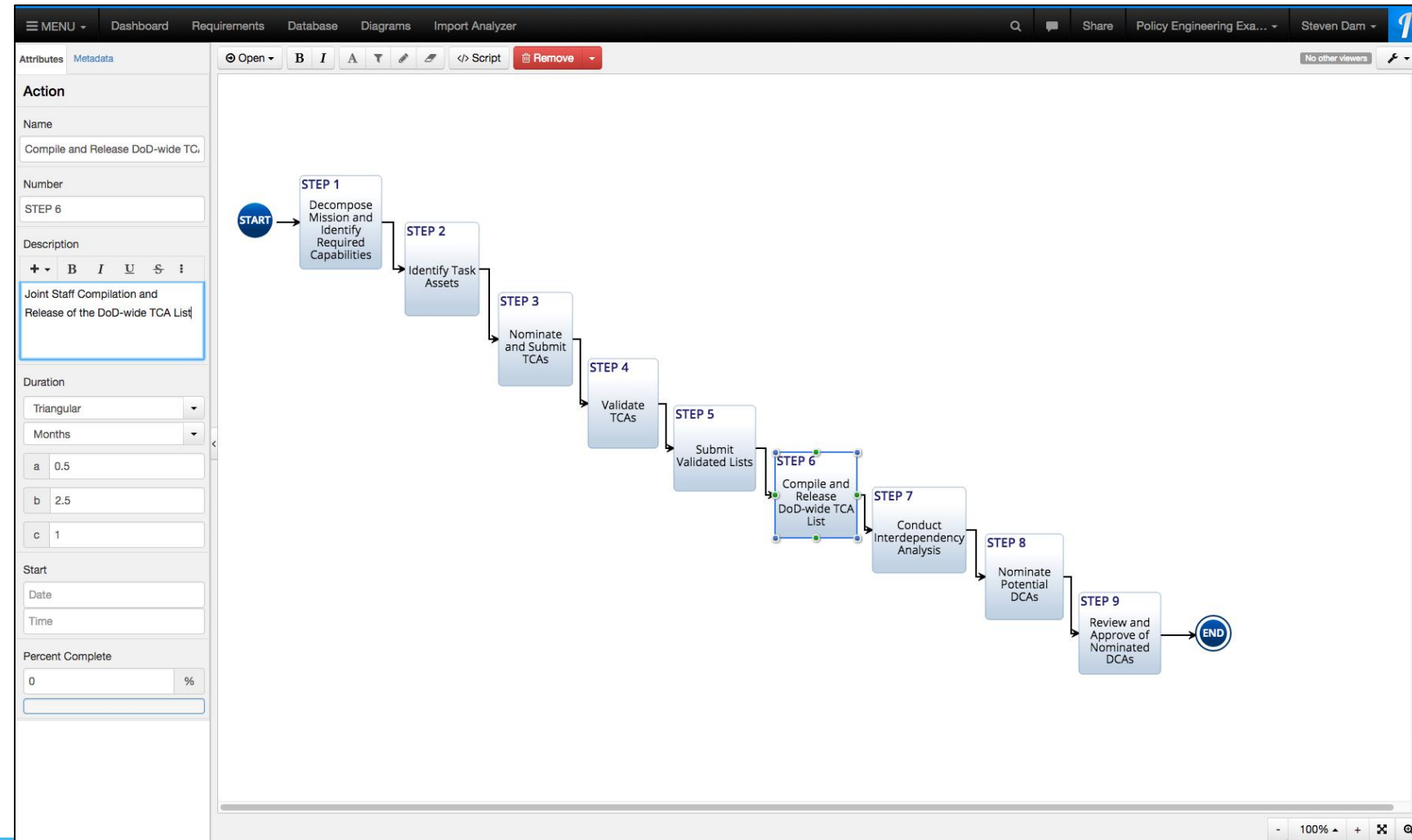
Capture Organization Information in Database

- Create hierarchy

- Allocate actions and requirements as appropriate
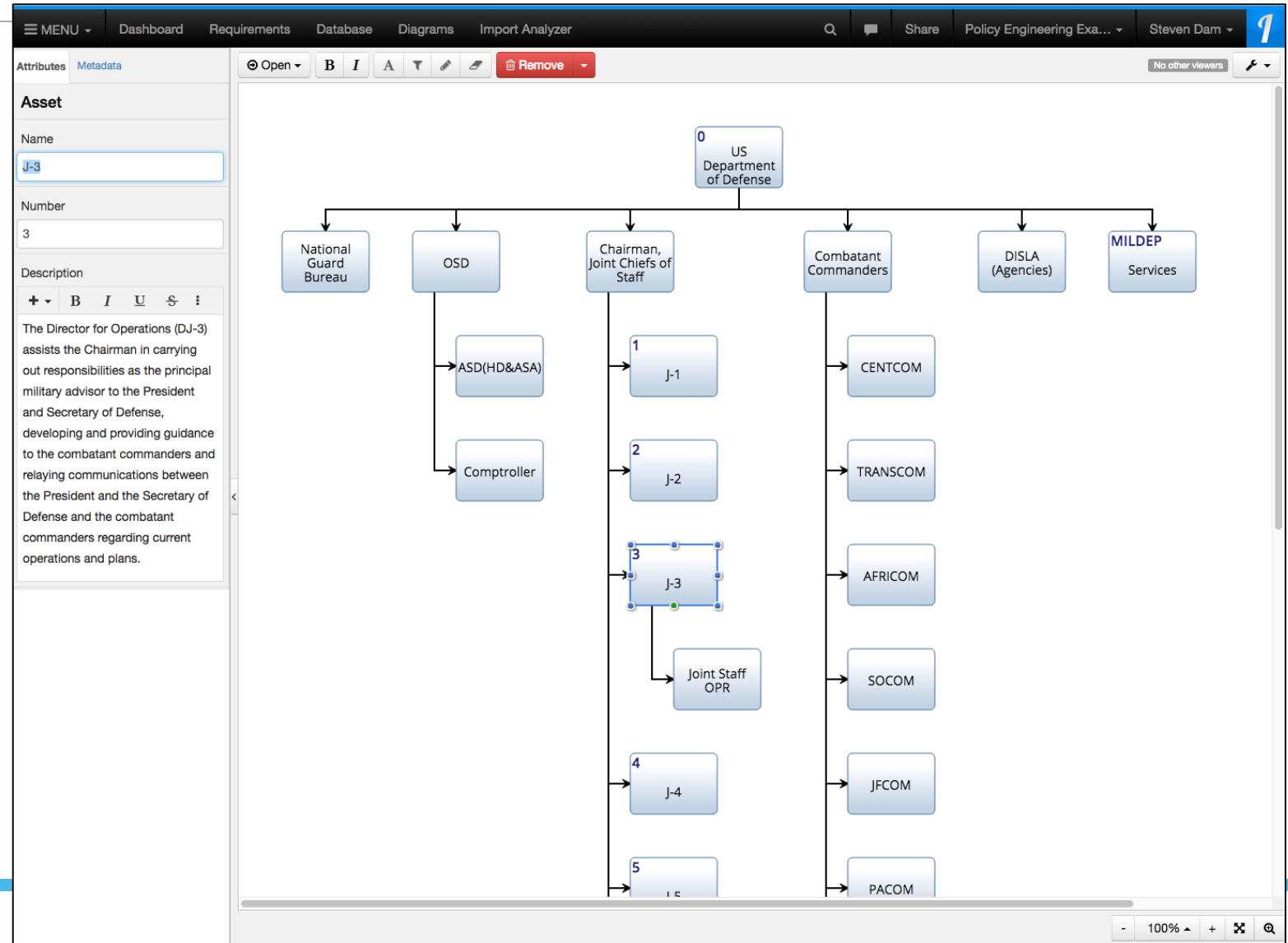
Allocate Tasks to Organizational Elements

- Create relationships between tasks and organizations, according to policies

- Use this information to determine if the correct organizations are being correctly tasked

- Suggest changes, as appropriate, and/or identify risks to the organization and mitigation strategies

Verify Processes Work through Simulation

- Uses timing and cost information for each step

- Distributions in time and cost provide a more realistic range of the process

- These distributions also provide a measure of cost and schedule risk
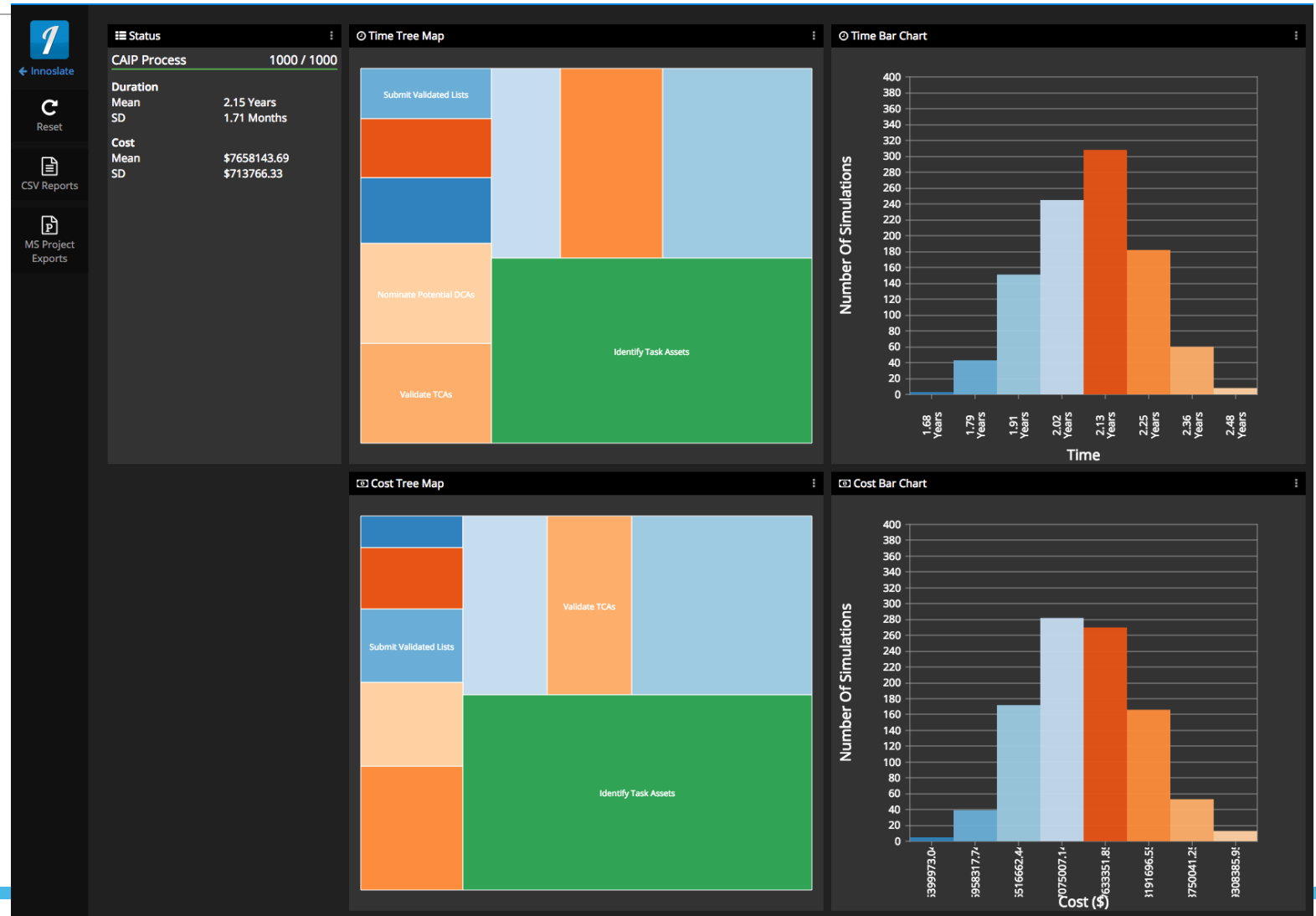
3. HOW CAN WE IMPLEMENT THIS APPROACH WITHOUT SCARING POLICY MAKERS?

Implementation Strategy

- Don't tell them you are doing systems engineering
  - o Most people think systems engineering only applies to hardware and software

- Perform the analysis, but only show results in a form that they will easily accept
  - o No UML, SysML, IDEF0, etc. drawings
  - o Simple summaries of changes (i.e., document markups and text summaries)
  - o No engineering jargon!

- Wait for them to ask how you got the results
  - o Then just show them the bare minimum of SE information
  - o Once they buy into these, you can start show them more

Summary

- Systems engineering can dramatically improve policy development and implementation

- You must work fast in doing your analysis – use multi-purpose tools with analytics to speed up your analysis and delivery

- Only show results, not how you got there … until necessary