# Traceability via Artificial Intelligence

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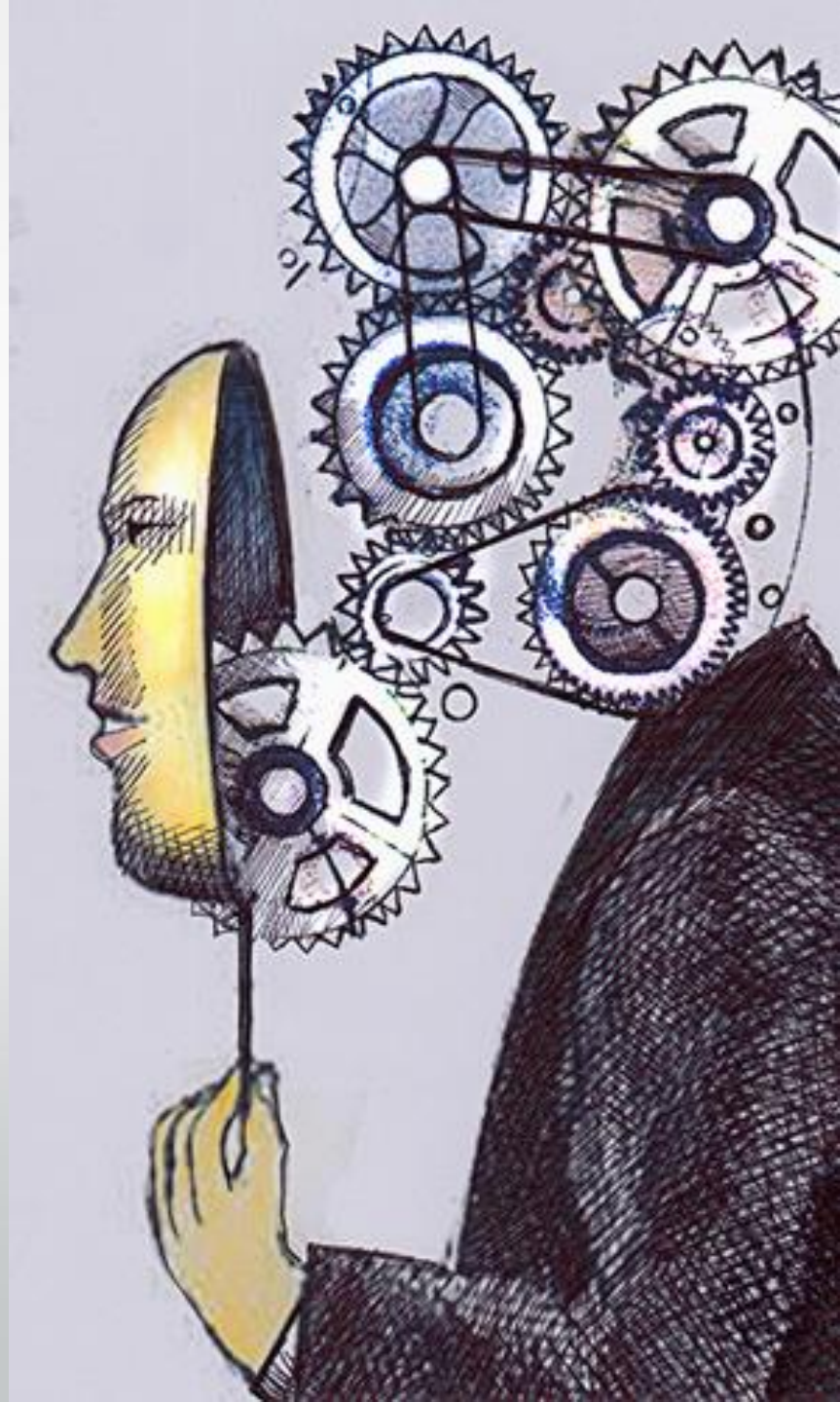


# Agenda

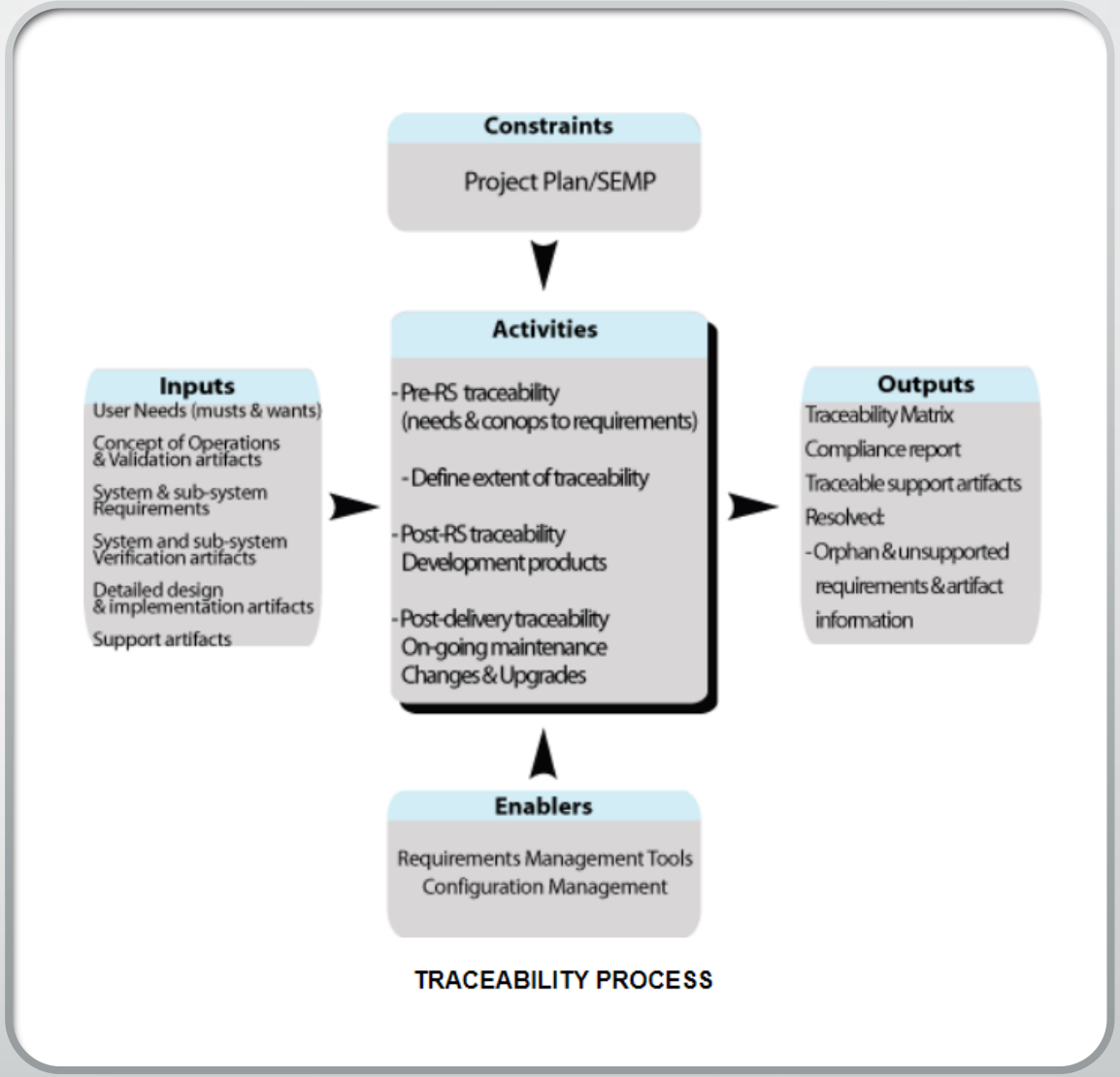
- Introduction
- What is Traceability
- Status Quo
- NLP and Algorithms
- Trace Assist, Suspect Assist
- Questions

# Bottom Line Up Front

- Current Traceability Matrices Are Excel or Requirements Tool Based
- Laborious, Time Consuming Effort
- Use of NLP and Advanced Algorithms
- Advanced User Interfaces
- Increase in Project/Program Fidelity

# Traceability

- Defined by IEEE:
- 1. The degree to which a relationship can be established between two or more products of the development process, especially in terms of parent child relationships.
- 2. The discernable association among two or more logical entities such as requirements, system elements, verifications, and tasks.

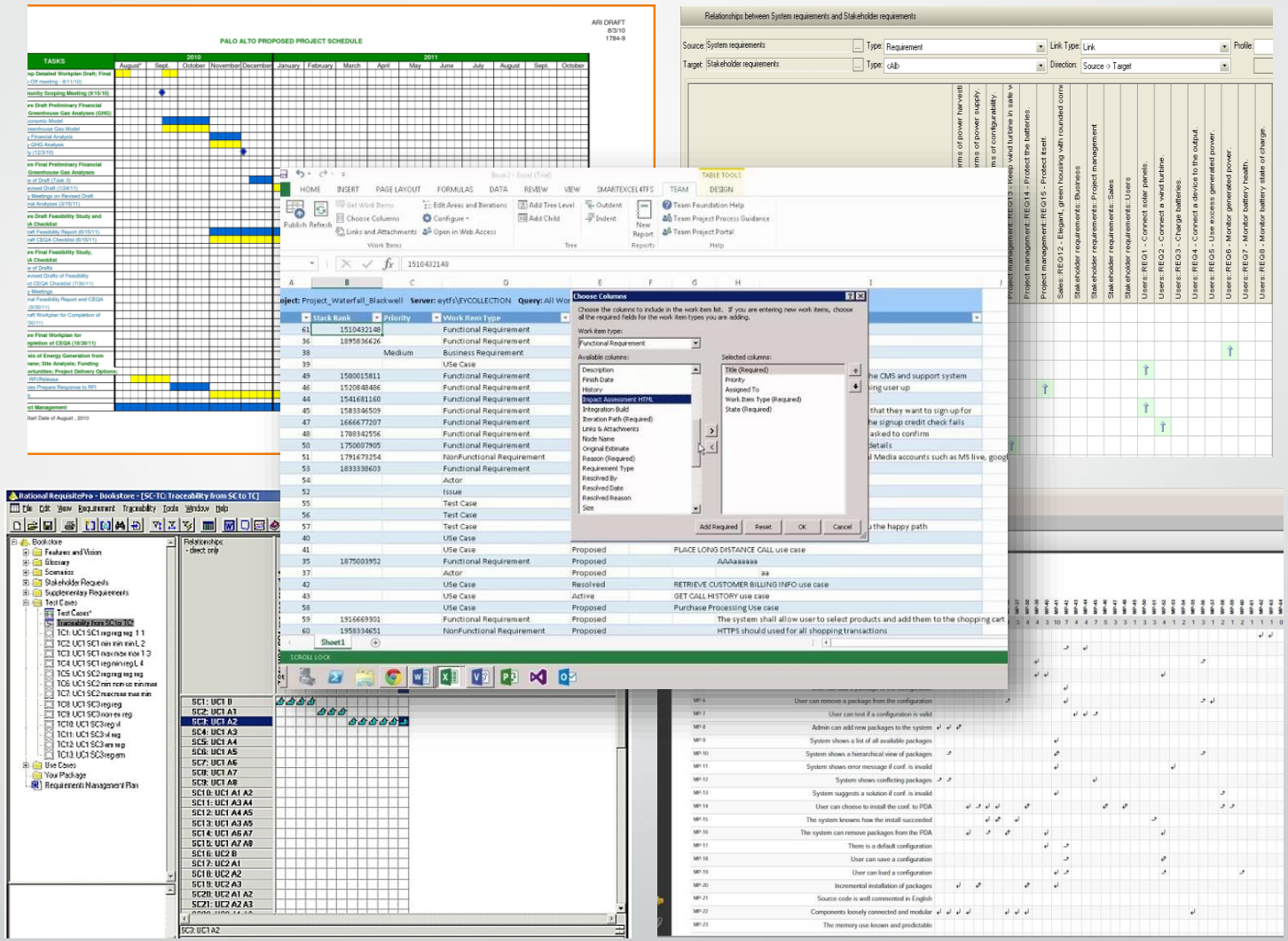


# It's More Than Requirements

- The ability to describe and follow the life of a requirement in both a forwards and backwards directions throughout the life of the project.
- How high level requirements can be transformed into low level requirements.
- Traceability is more than just requirements.
  - Design Specifications
  - Test Cases
  - Verification and Validation
  - Measures
  - Characteristics

# Status Quo

- Traceability Matrices
  - Excel, CSV
  - Requirements Tools (COTS)



# NLP and Advanced Algorithms

## Natural Language Processing

Information engineering

Interactions between human and computer languages

How computers process large amounts of natural language data

## Algorithms

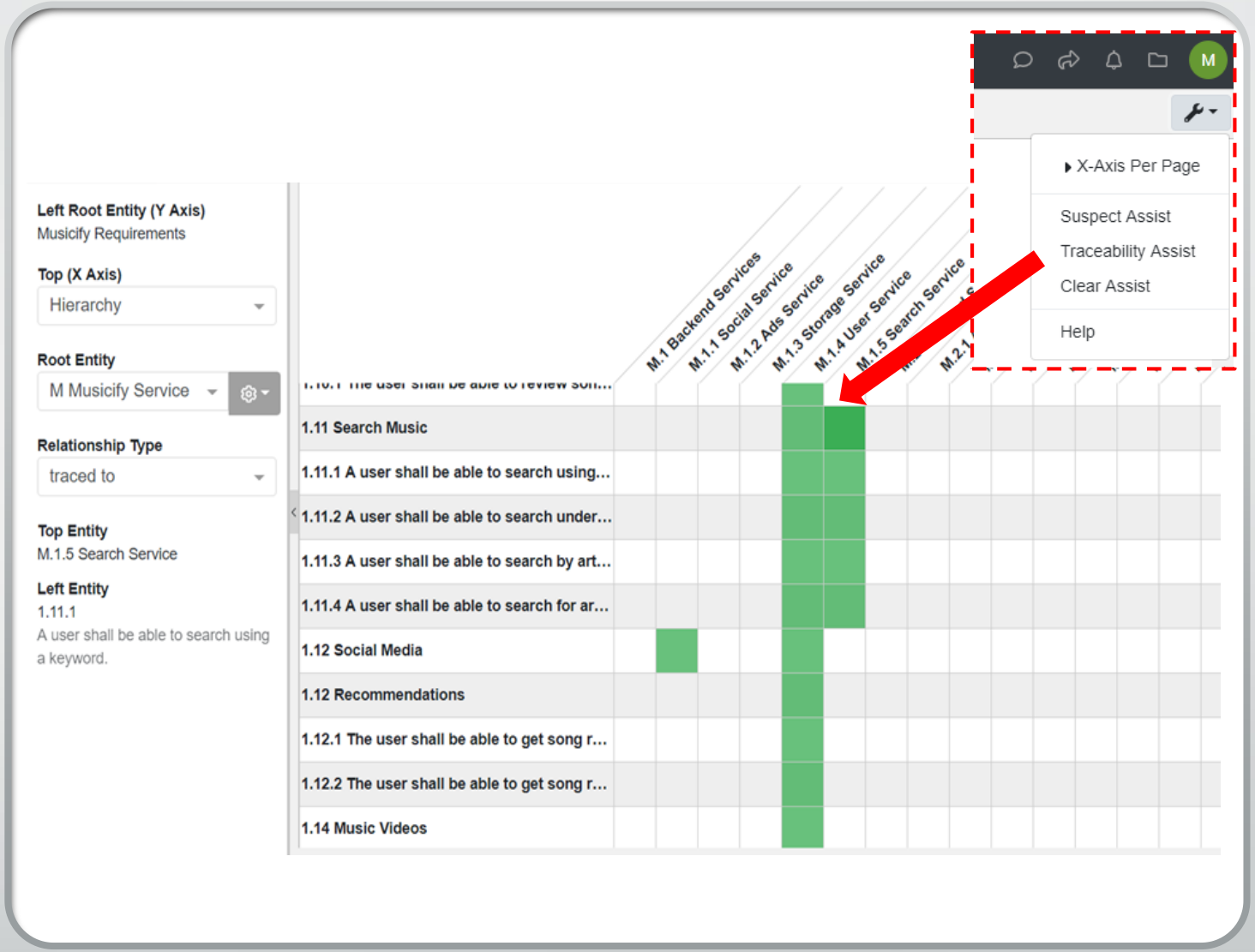
Unsupervised

Semi-supervised learning

Supervised learning

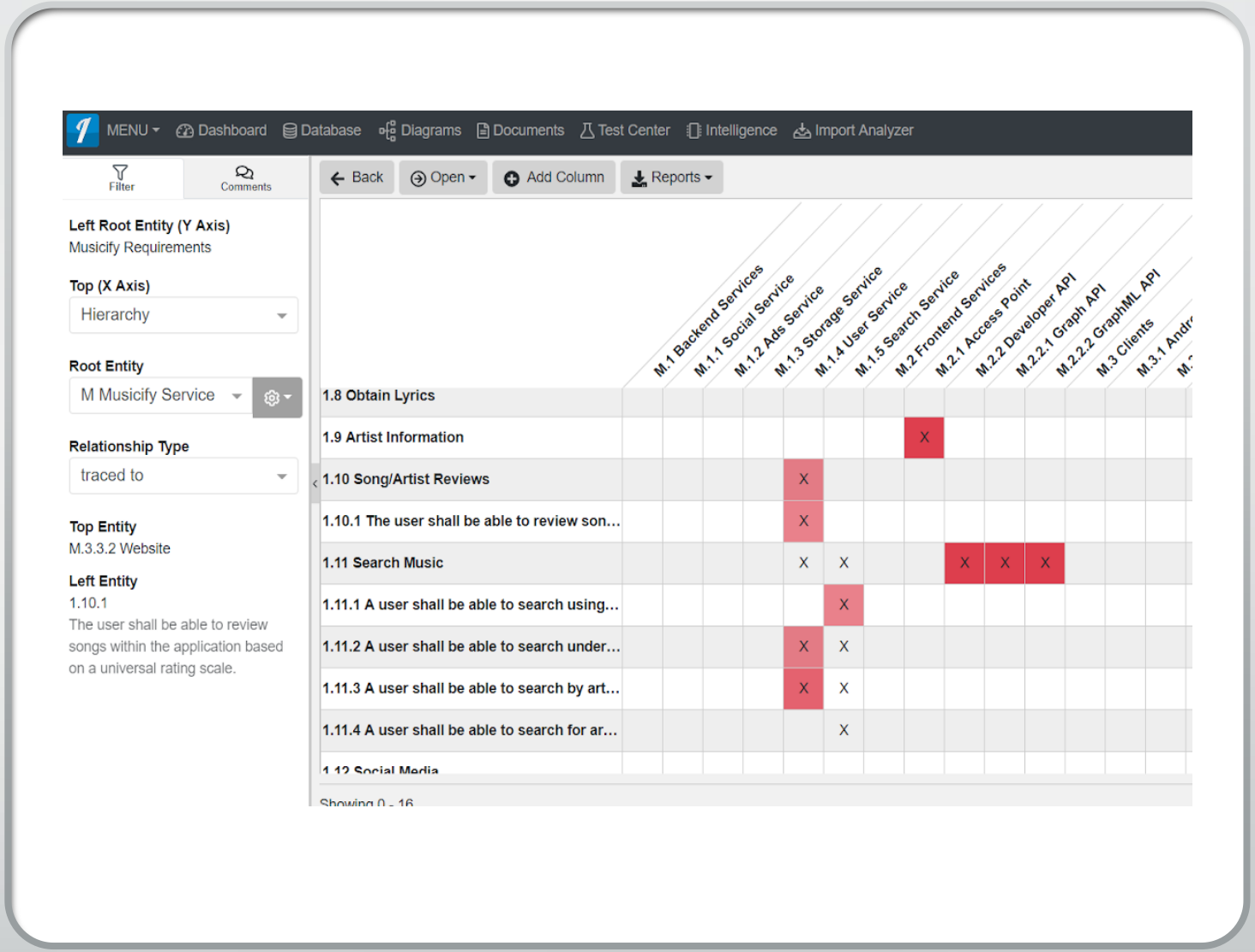
# Trace Assist

- Traceability Matrix
  - Artificial Intelligence
  - Identify X and Y Axes
  - Define Relationship
  - Run Trace Assist
  - Review Descriptions
  - Make Relationships



# Suspect Assist

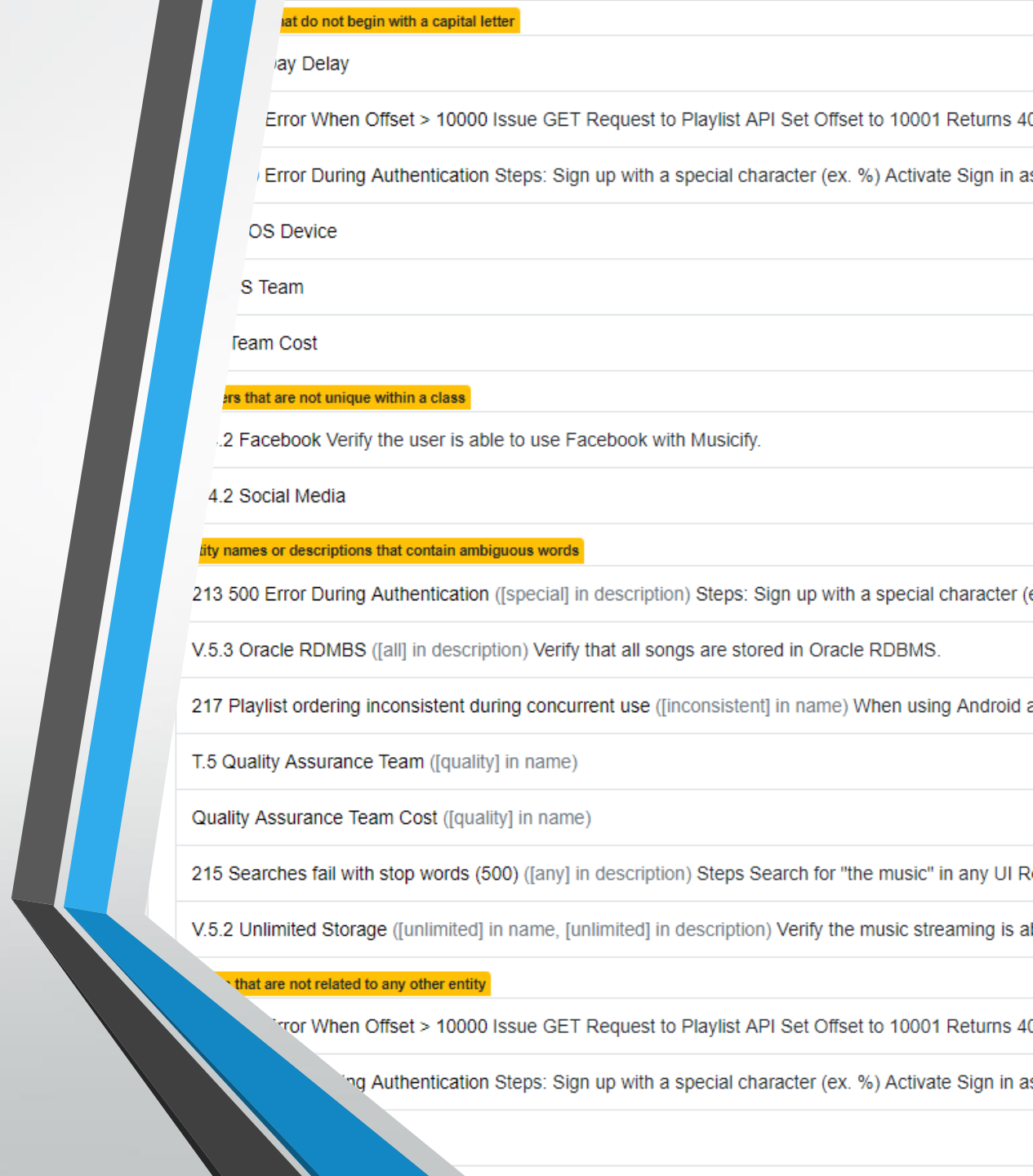
- Traceability Matrix
  - Artificial Intelligence
  - Identify X and Y Axes
  - Define Relationship
  - Run Suspect Assist
  - Review Descriptions
  - Remove Relationships



# Intelligence View

- Intelligence View
  - Analyzes progress of project
  - Uses heuristics
- Automated
  - Updated when saved
  - Artificial Intelligence
  - NLP
  - HIS

  - Fidelity



# Questions