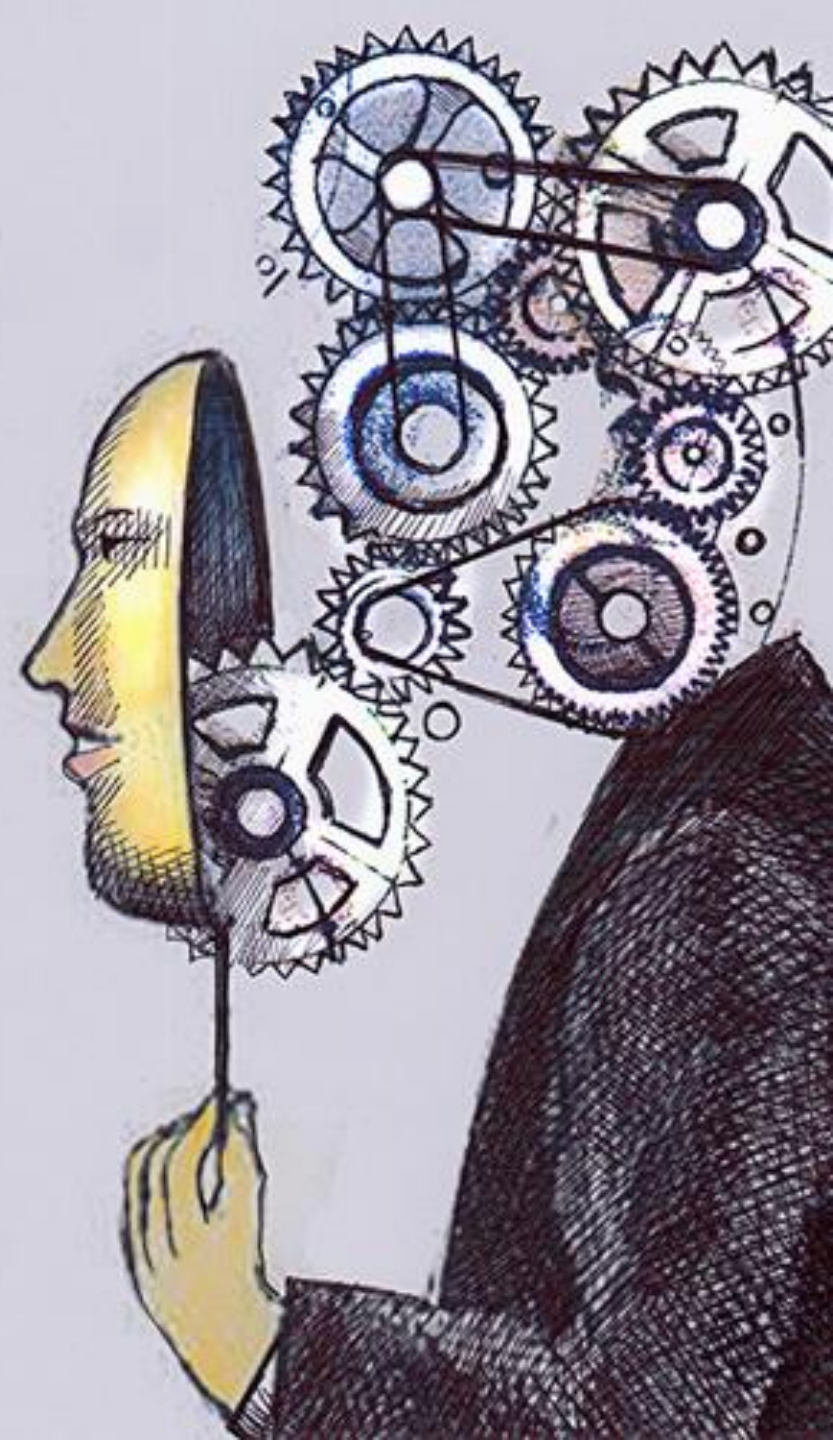


# Traceability via Artificial Intelligence

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# Agenda



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

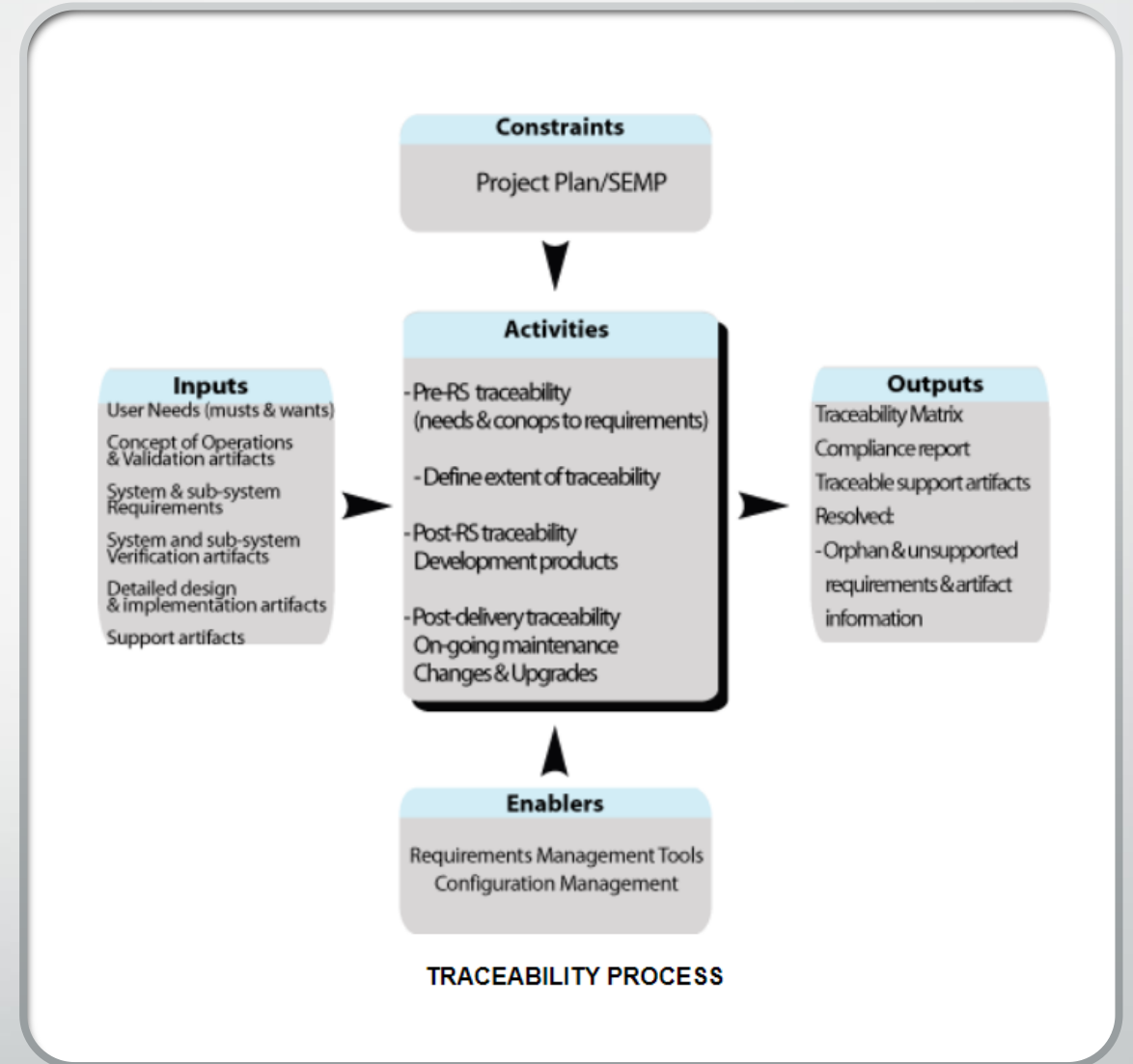
# Bottom Line Up Front



- 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)

The collage illustrates various tools used in requirements management and project scheduling. Key elements include:

- Gantt Chart:** 'PALO ALTO PROPOSED PROJECT SCHEDULE' showing tasks from August 2010 to October 2011.
- Excel Spreadsheet:** A table with columns for 'Stack Rank', 'Priority', and 'Work Item Type'. A 'Choose Columns' dialog box is open, showing available columns like 'Description', 'Priority', and 'Work Item Type'.
- Relationships Diagram:** A diagram titled 'Relationships between System requirements and Stakeholder requirements' showing a 'Source' of 'System requirements' and a 'Target' of 'Stakeholder requirements'.
- Requirements Tool:** 'National Requirements - Bookstore - [SC1] Traceability from SC to TC'. The interface shows a tree view on the left with categories like 'Goals and Vision', 'Stakeholder Requirements', and 'Test Cases'. The main area displays a list of requirements with columns for ID, description, and status.

# 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

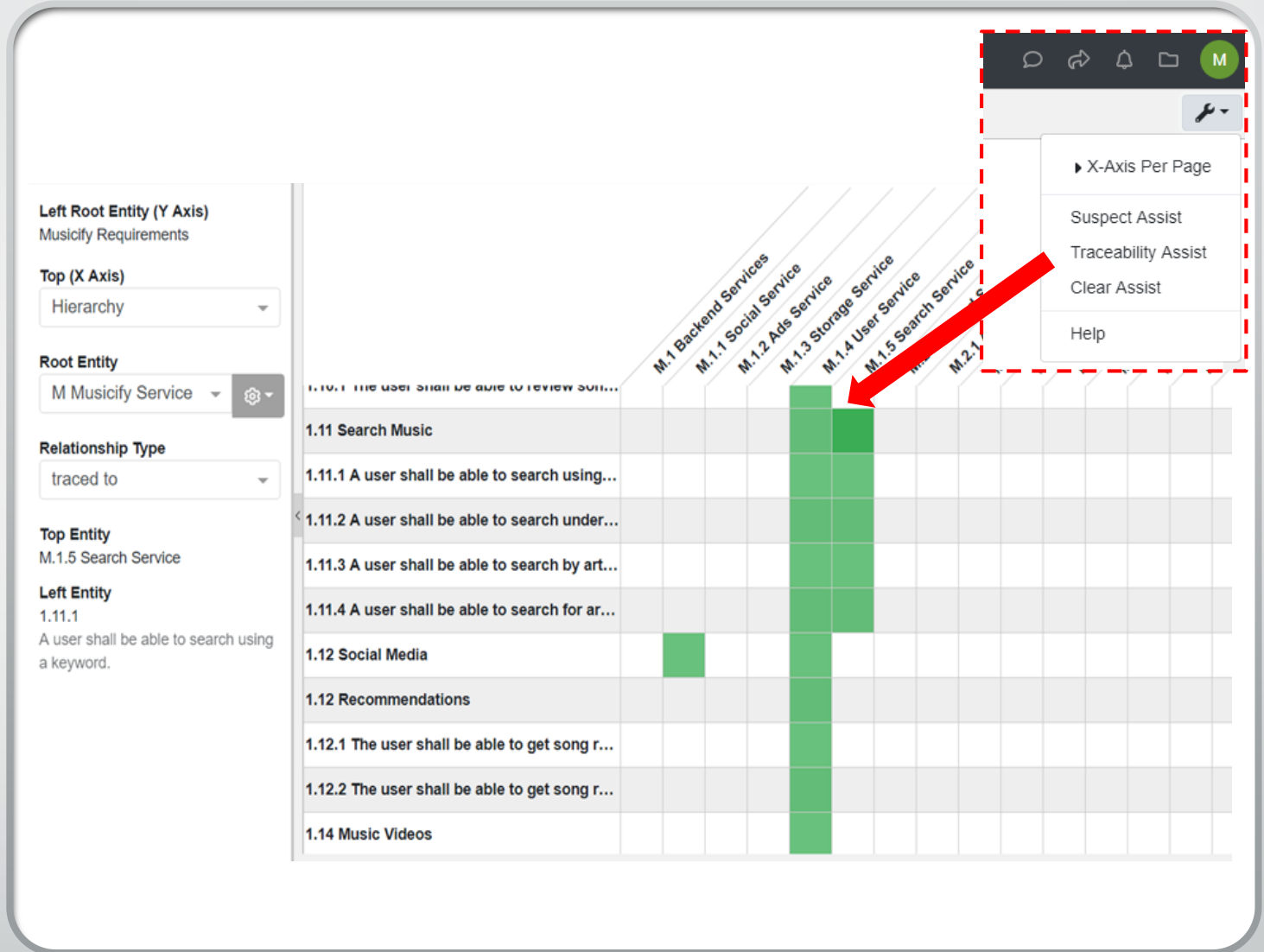
Unsupervised

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

The screenshot shows the Suspect Assist Traceability Matrix interface. The top navigation bar includes: MENU, Dashboard, Database, Diagrams, Documents, Test Center, Intelligence, and Import Analyzer. Below the navigation bar are tabs for Filter and Comments, and buttons for Back, Open, Add Column, and Reports.

The left sidebar contains the following configuration options:

- Left Root Entity (Y Axis):** Musicify Requirements
- Top (X Axis):** Hierarchy
- Root Entity:** M Musicify Service
- Relationship Type:** traced to
- Top Entity:** M.3.3.2 Website
- Left Entity:** 1.10.1 The user shall be able to review songs within the application based on a universal rating scale.

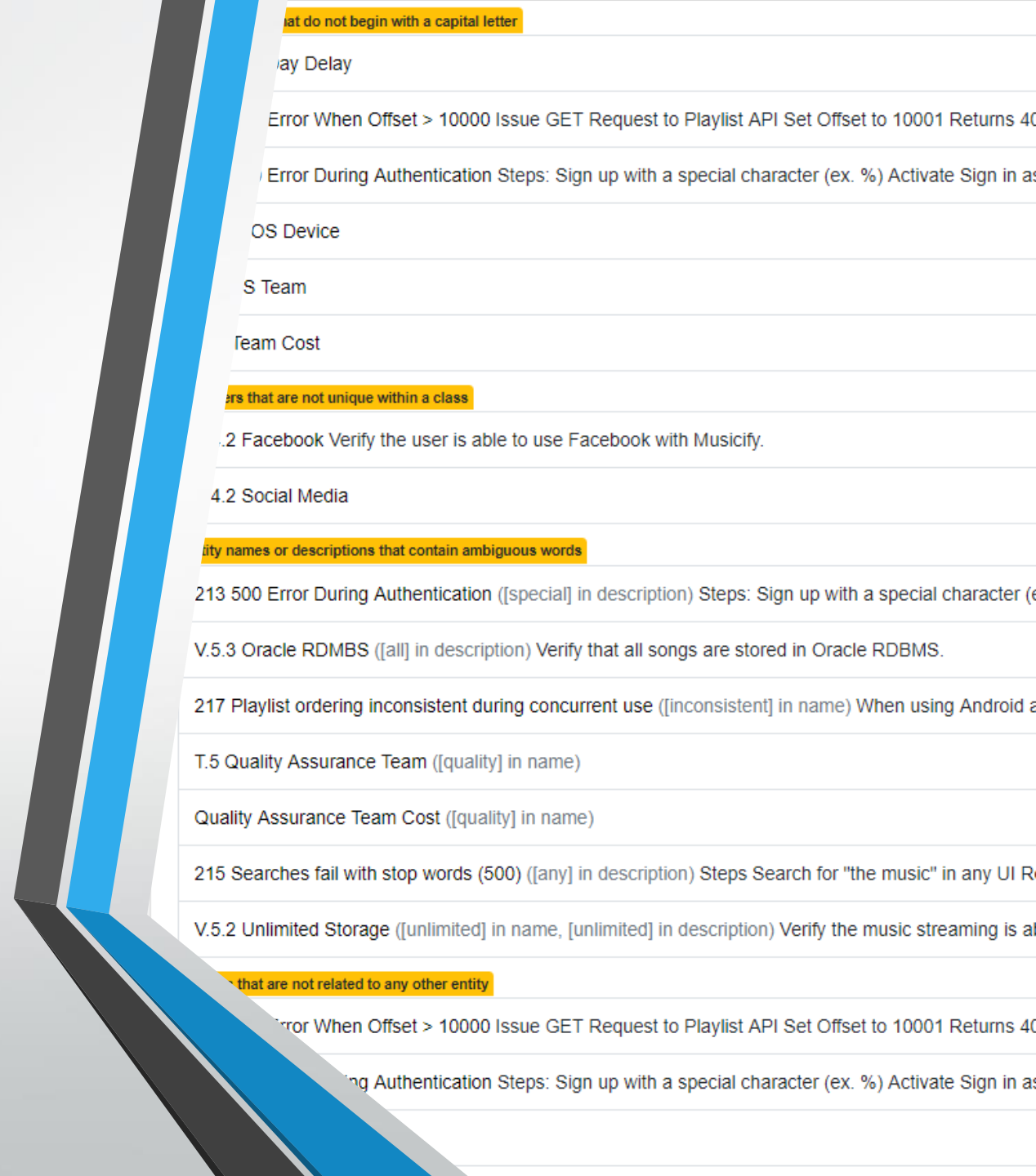
The main area displays a traceability matrix with the following columns (services) and rows (requirements):

	M.1 Backend Services	M.1.1 Social Service	M.1.2 Ads Service	M.1.3 Storage Service	M.1.4 User Service	M.1.5 Search Service	M.2 Frontend Services	M.2.1 Access Point	M.2.2 Developer API	M.2.2.1 Graph API	M.3 Clients	M.3.1 Andr...
1.8 Obtain Lyrics												
1.9 Artist Information							X					
1.10 Song/Artist Reviews			X									
1.10.1 The user shall be able to review son...		X										
1.11 Search Music		X	X				X	X	X			
1.11.1 A user shall be able to search using...					X							
1.11.2 A user shall be able to search under...		X	X									
1.11.3 A user shall be able to search by art...		X	X									
1.11.4 A user shall be able to search for ar...					X							
1.12 Social Media												

Showing 0 - 16

# Intelligence View

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



Questions

