

# **Data Integration Support for Offshore Decommissioning Waste Management**

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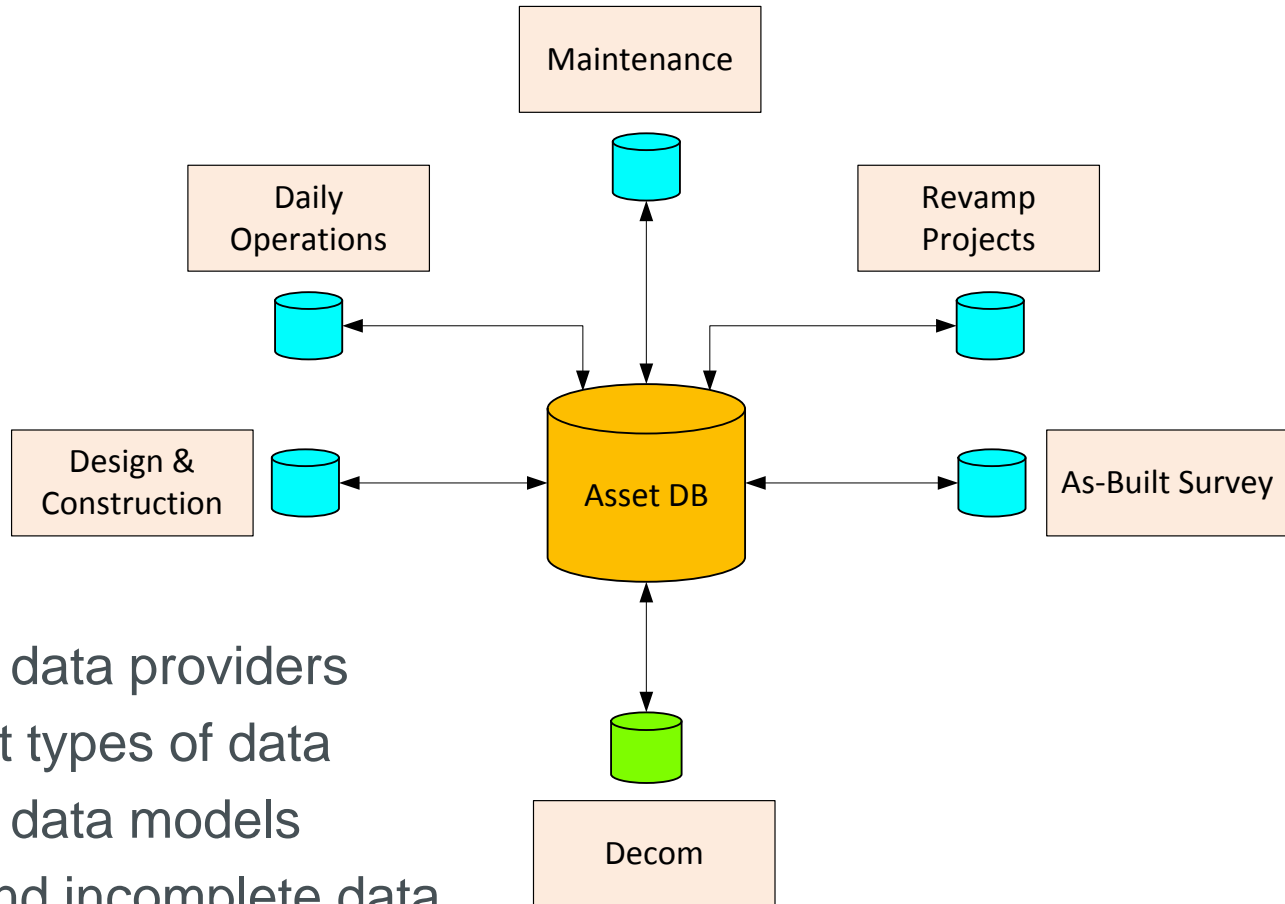
# Outline

- Business Case
- Data Integration Challenges
- ISO 15926
- Semantic Web
- Integration Framework
- Use case
- Conclusion

# Business Case

- Commercial
  - Tax rebate
  - Low oil price
  - Business opportunities
- Safety
  - Offshore trips
  - Safe working
- Regulation
  - OSPAR
  - UK Energy Act

# Integration Challenges



- Multiple data providers
- Different types of data
- Multiple data models
- Noisy and incomplete data
- Legacy Data

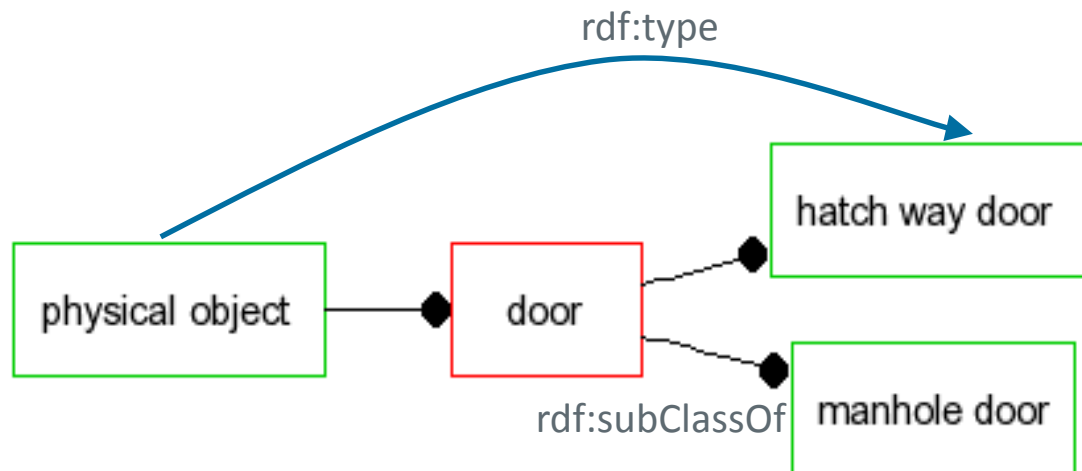
# ISO 15926

13 Parts - 5 important for integration

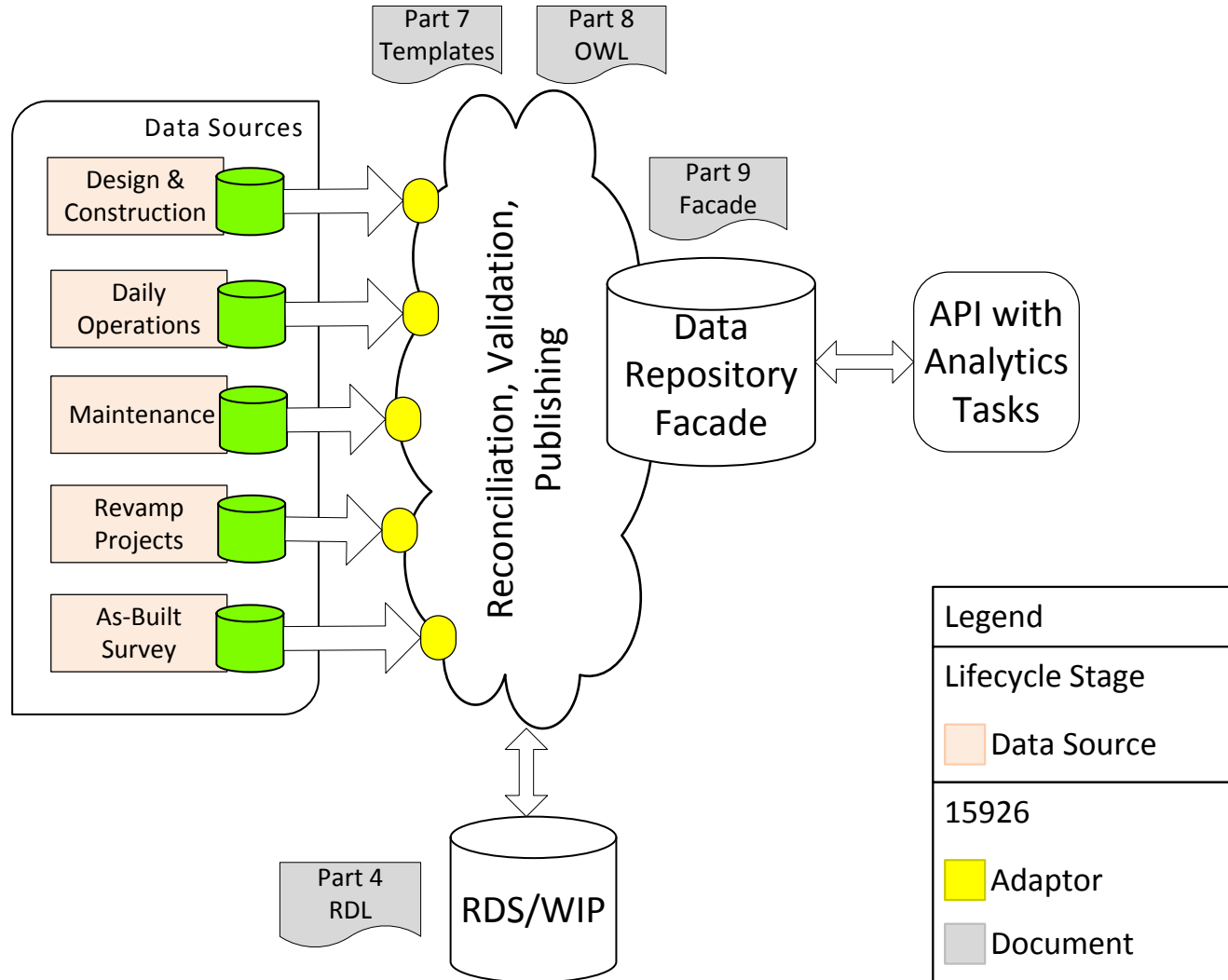
15926 Part 2 Core Data Model	Natural Language Grammar Basic Rules
15926 Part 4 Reference Data	Dictionary & Thesaurus Words & terms
15926 Part 7 Templates	Phrase, Sentence, Paragraph Useful semantic structures
15926 Part 8 RDF/OWL	Paper, File, Stone Tablet Representation technology
15926 Part 9 Facades	Website Read, write, query, service technology

# Semantic Web

- Web of linked data (Berners-Lee et. al, 2001)
- URI representation of things
- Use of HTTP URIs
- OWL – building of ontologies
- RDF – publishing of linked data (Triple: Subject –predicate-object)
- SPARQL – querying of RDF data



# Integration Framework



# Use Case: Steel Reuse

- Typical North Sea Platform = 97% Steel
- 1/2 million tonnes steel to be decommissioned by 2023  
(RSA Great Recovery Report, 2015)

## Information Requirement

- Structural MTO (Excel)
- Virtual 3D (Point Cloud)
- Framing Plan (PDF)
- 3D CAD Model
- Weight Report
- Condition Reports
- Maintenance Logs
- Revamp Project Data
- Materials Inventory

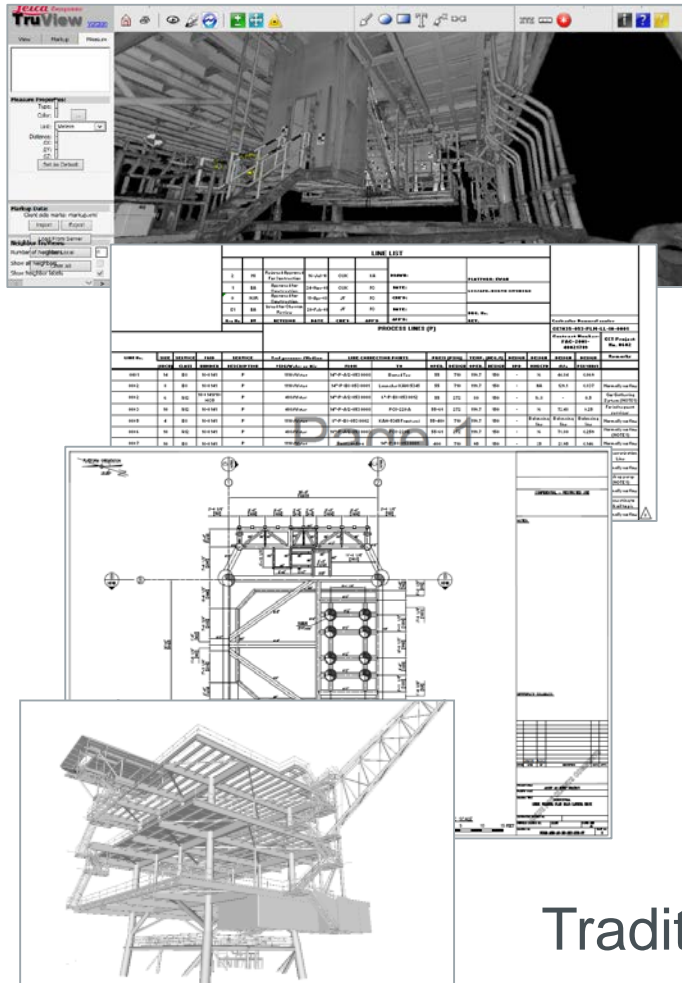
## Assessment Criteria

- Age
- Coating
- Certification
- Fabrication features e.g. welding, boring and resizing



# Use Case: Steel Reuse

Search, navigate, extract...



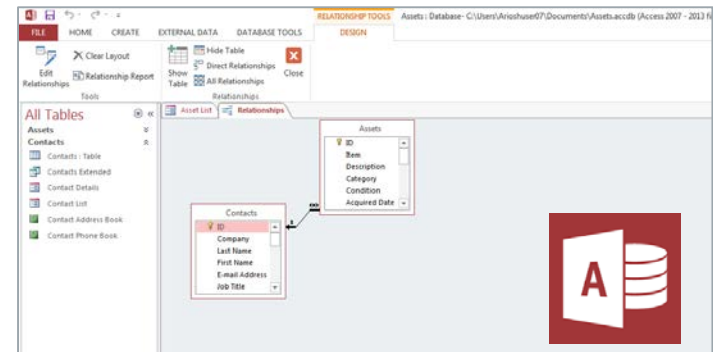
The screenshot shows the TruView software interface. At the top, there's a 3D model of a complex steel structure. Below it, a 'LINE LIST' table is visible, listing various structural elements. At the bottom, there's a 2D structural drawing of a steel frame.

LINE NO.	LINE TYPE	LINE DESCRIPTION	LINE MATERIAL	LINE THICKNESS	LINE AREA	LINE VOLUME	LINE WEIGHT	LINE CENTERLINE	LINE STATUS
101	PLATE	PLATE 101	STEEL	10	1000	10000	10000	10000	ACTIVE
102	PLATE	PLATE 102	STEEL	10	1000	10000	10000	10000	ACTIVE
103	PLATE	PLATE 103	STEEL	10	1000	10000	10000	10000	ACTIVE
104	PLATE	PLATE 104	STEEL	10	1000	10000	10000	10000	ACTIVE
105	PLATE	PLATE 105	STEEL	10	1000	10000	10000	10000	ACTIVE

Populate, qualify, quantify...

LIN	DESCRIPTION	REUSEABLE STEEL					
		VOLUME	THICKNESS	AREA	WEIGHT	REUSABLE	WASTE
1	PLATE 101	1000	10	10000	10000	10000	10000
2	PLATE 102	1000	10	10000	10000	10000	10000
3	PLATE 103	1000	10	10000	10000	10000	10000
4	PLATE 104	1000	10	10000	10000	10000	10000
5	PLATE 105	1000	10	10000	10000	10000	10000
6	PLATE 106	1000	10	10000	10000	10000	10000
7	PLATE 107	1000	10	10000	10000	10000	10000
8	PLATE 108	1000	10	10000	10000	10000	10000
9	PLATE 109	1000	10	10000	10000	10000	10000
10	PLATE 110	1000	10	10000	10000	10000	10000
11	PLATE 111	1000	10	10000	10000	10000	10000
12	PLATE 112	1000	10	10000	10000	10000	10000
13	PLATE 113	1000	10	10000	10000	10000	10000
14	PLATE 114	1000	10	10000	10000	10000	10000
15	PLATE 115	1000	10	10000	10000	10000	10000
16	PLATE 116	1000	10	10000	10000	10000	10000
17	PLATE 117	1000	10	10000	10000	10000	10000
18	PLATE 118	1000	10	10000	10000	10000	10000
19	PLATE 119	1000	10	10000	10000	10000	10000
20	PLATE 120	1000	10	10000	10000	10000	10000
21	PLATE 121	1000	10	10000	10000	10000	10000
22	PLATE 122	1000	10	10000	10000	10000	10000
23	PLATE 123	1000	10	10000	10000	10000	10000
24	PLATE 124	1000	10	10000	10000	10000	10000

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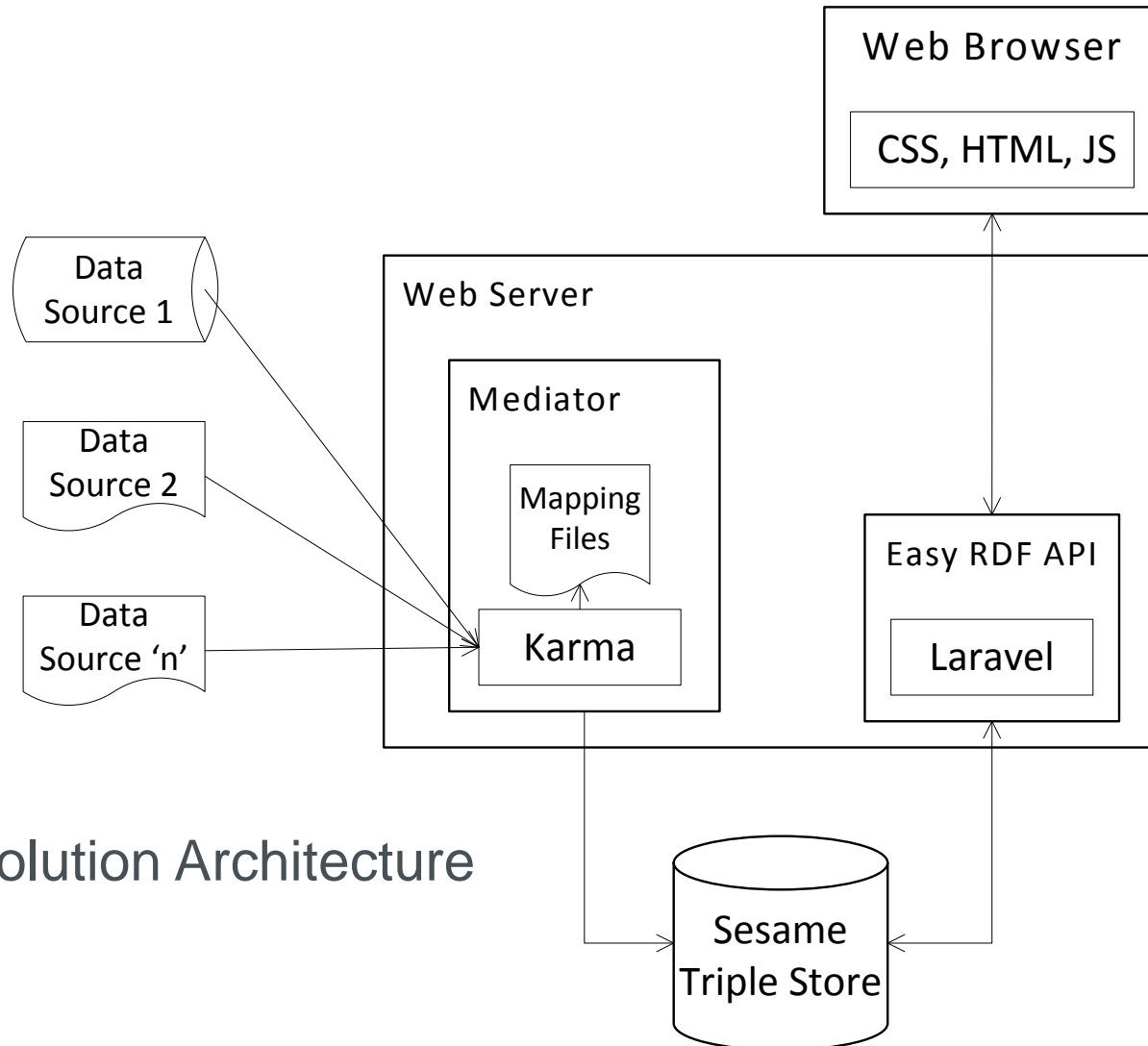
The screenshot shows the Microsoft Access database interface. The 'Contacts' table structure is displayed with the following fields:

- ID
- Company
- Last Name
- First Name
- E-mail Address
- Job Title



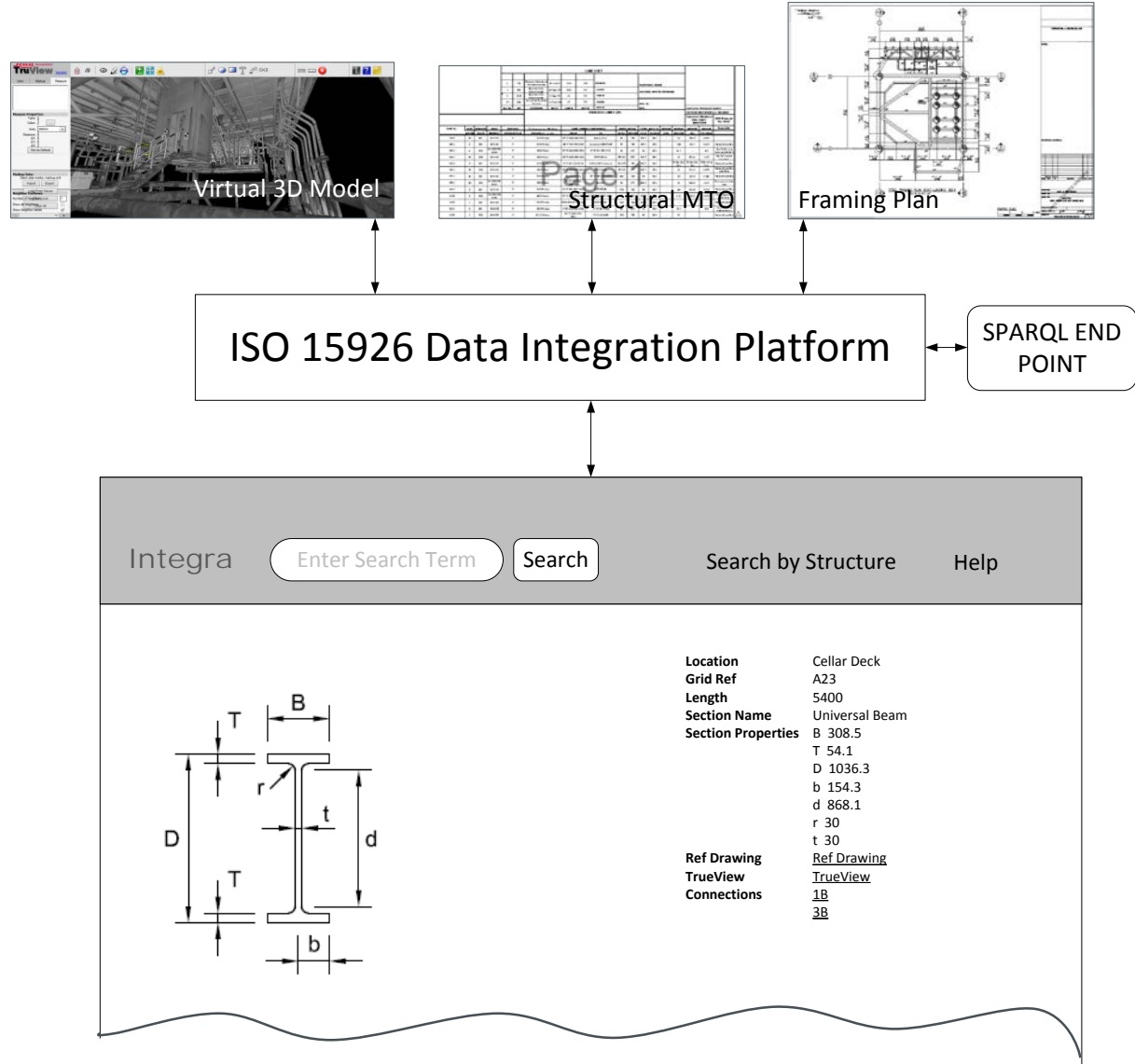
Traditional approach

# Use Case: Steel Reuse



Sample Solution Architecture

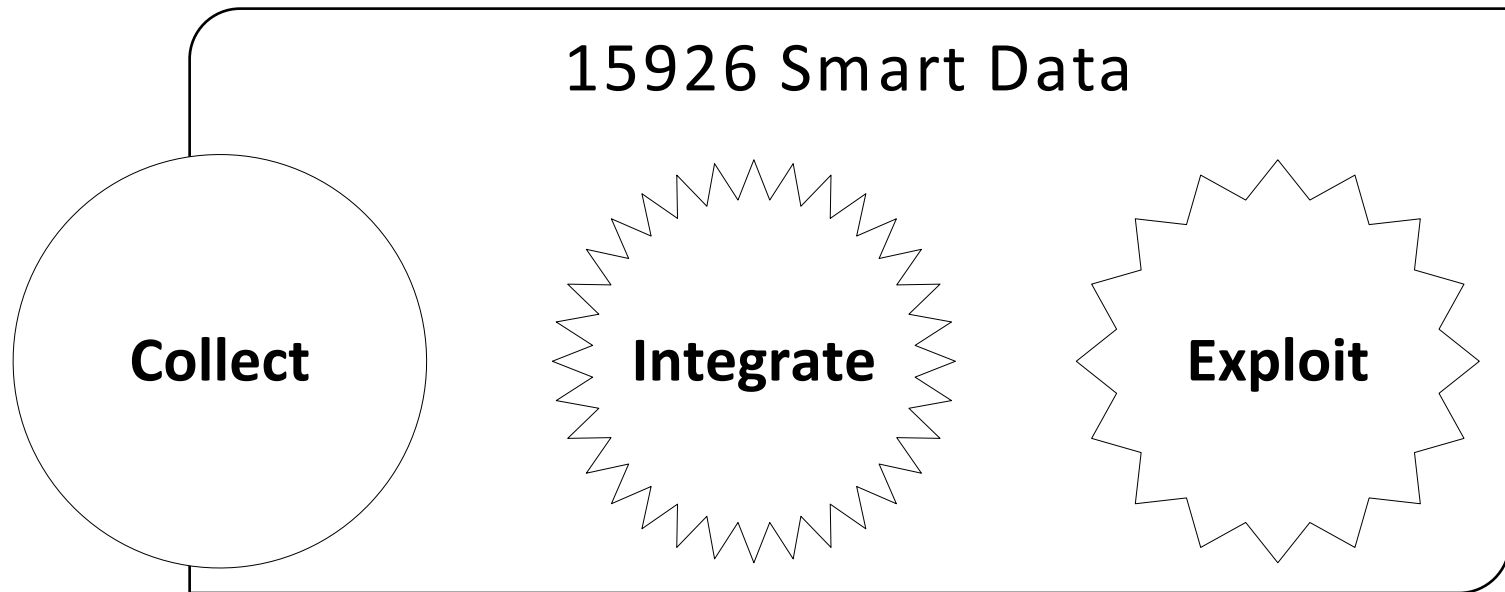
# Use Case: Steel Reuse



Interfaces

# Conclusion

- Cost Savings
- Work Efficiency
- New skill for decom engineers



# Resources



# Thanks

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15926 Smart Data

**Collect**

**Integrate**

**Exploit**