

# 4th Model Based Space Systems and Software Engineering ~ MBSE2023

November 16, 2023  
ESA/ESTEC  
Europe/Amsterdam timezone



## SysDICE

KNOWLEDGE FOR IMPACT

### Elevator Pitch

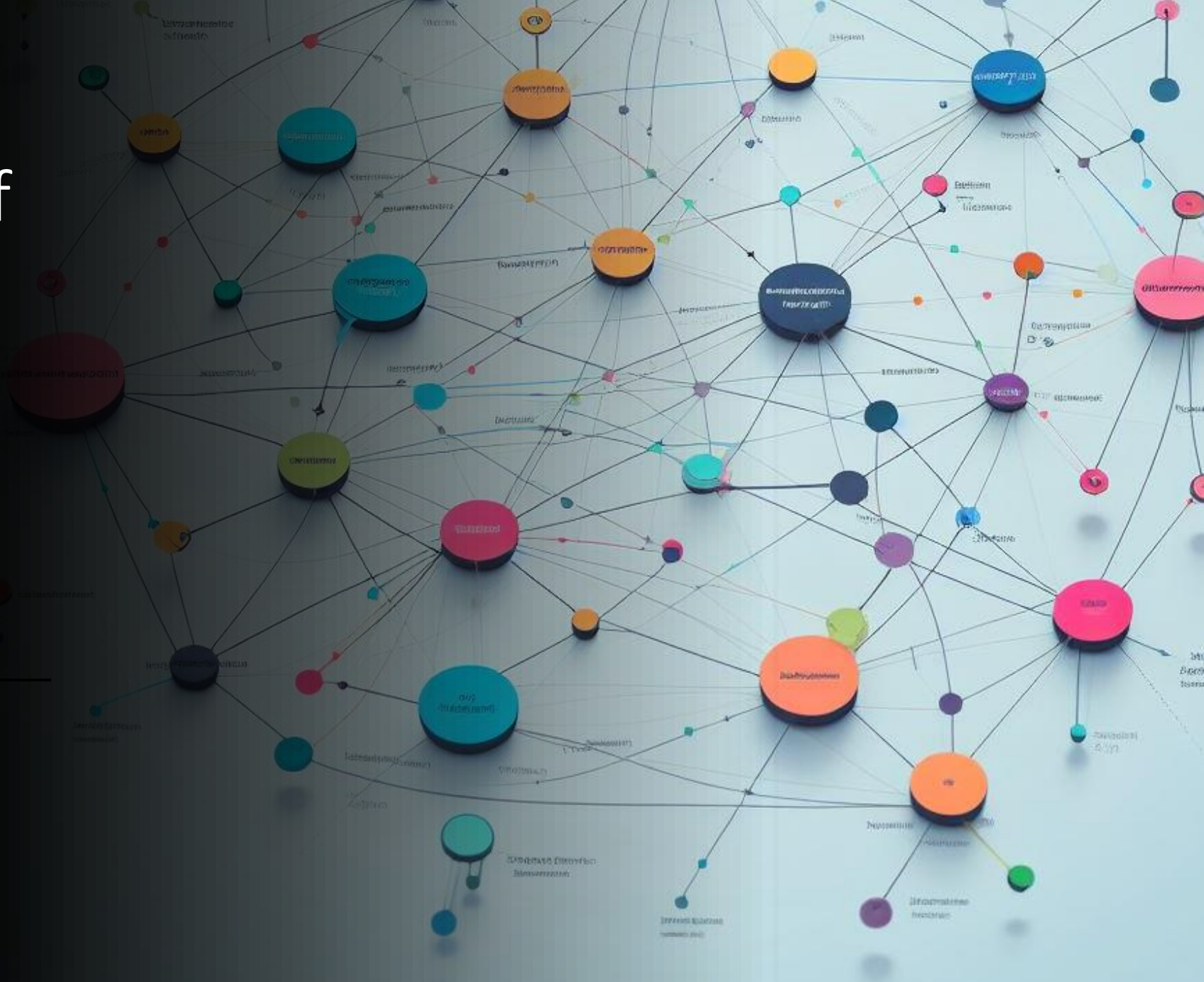
# Can Artificial Intelligence and Machine Learning Help to Link Data Across Domains?

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*16<sup>th</sup> November 2023, Version 1.0*

When you think of  
“DATA LINKING”,  
which “ANALOGY”  
comes to mind?





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**00:10**

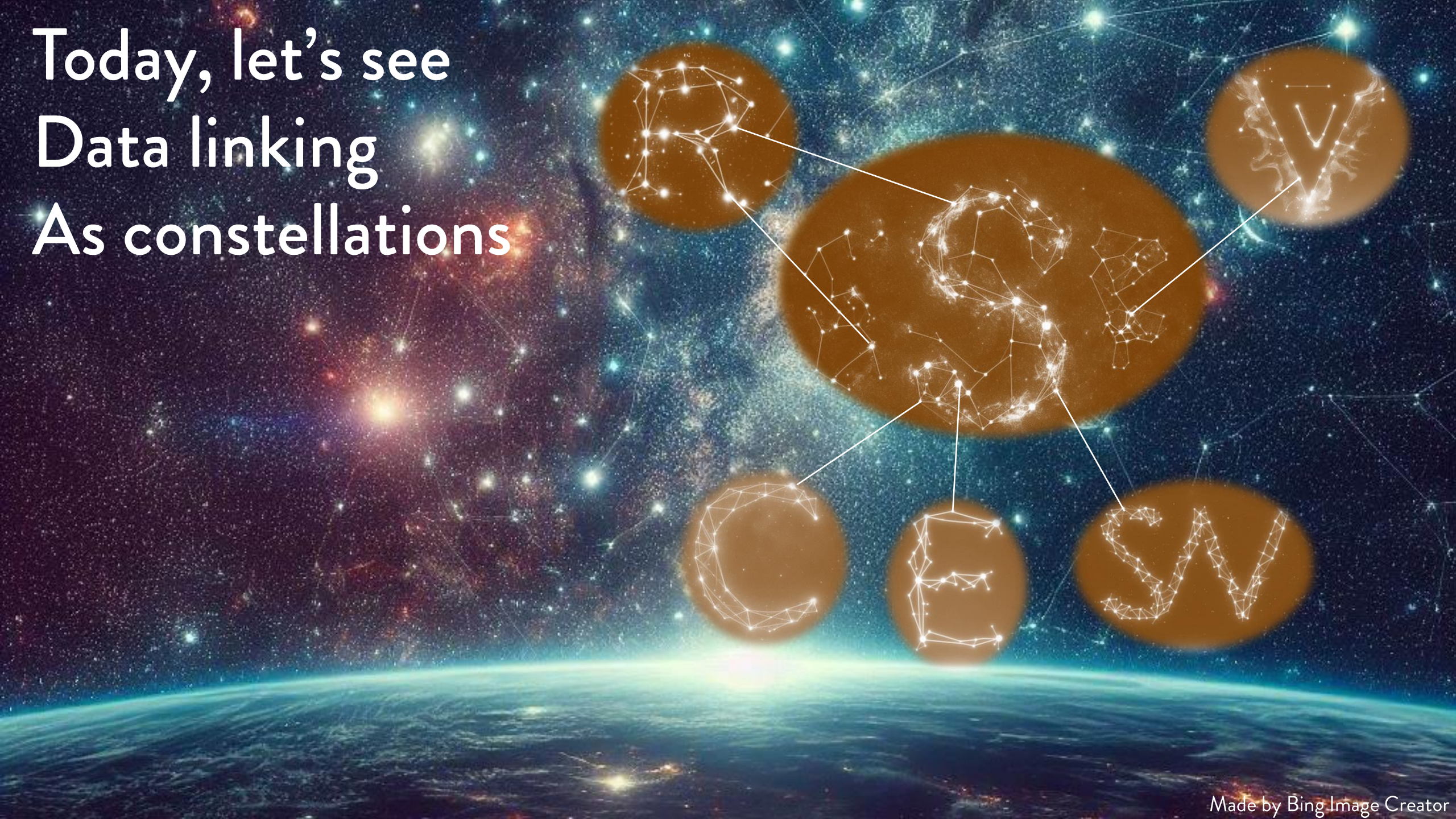


**CAN YOU THINK OF ANY OTHER ANALOGIES?**

**Q1**



Today, let's see  
Data linking  
As constellations





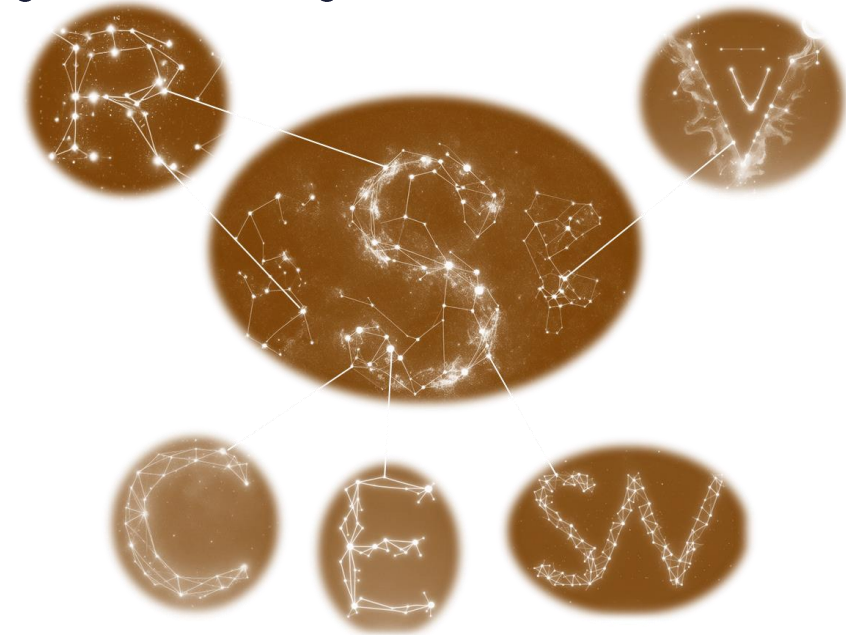
# Background

*Dealing with the digital thread requires traceability, exchange and integration*



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- Having **multiple modelling tools** is essential
- A **universal tool solution** is impractical.
- Different types of **data linking** between model- based domains:
  1. **No Link:** Export/import or copy/paste
  2. **Resource-Intensive Link:** Managed copy
  3. **Reference Link:** Refence between source and target



**ARE THERE ANY OTHER TYPES TO DATA LINKING?**

Q2

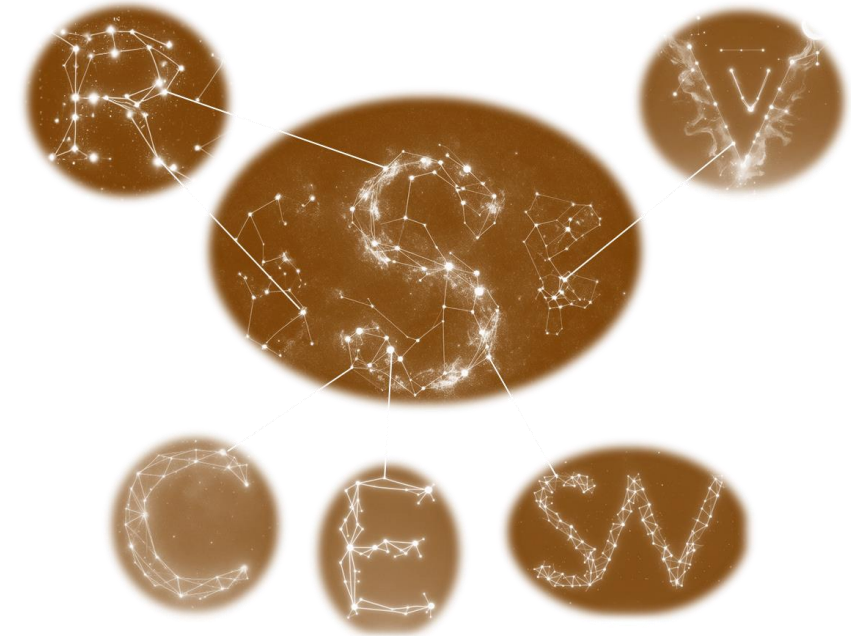
# Problems with Existing Approaches

*Challenging traceability, exchange and integration*

- **Problem 1:** Unrecognized and unaddressed intermediary integration tools
- **Problem 2:** Manual link creation and maintenance challenges in existing integration tools
- **Problem 3:** Lack of well-established open standards for data integration
- **Problem 4:** Complex version and configuration management of data links



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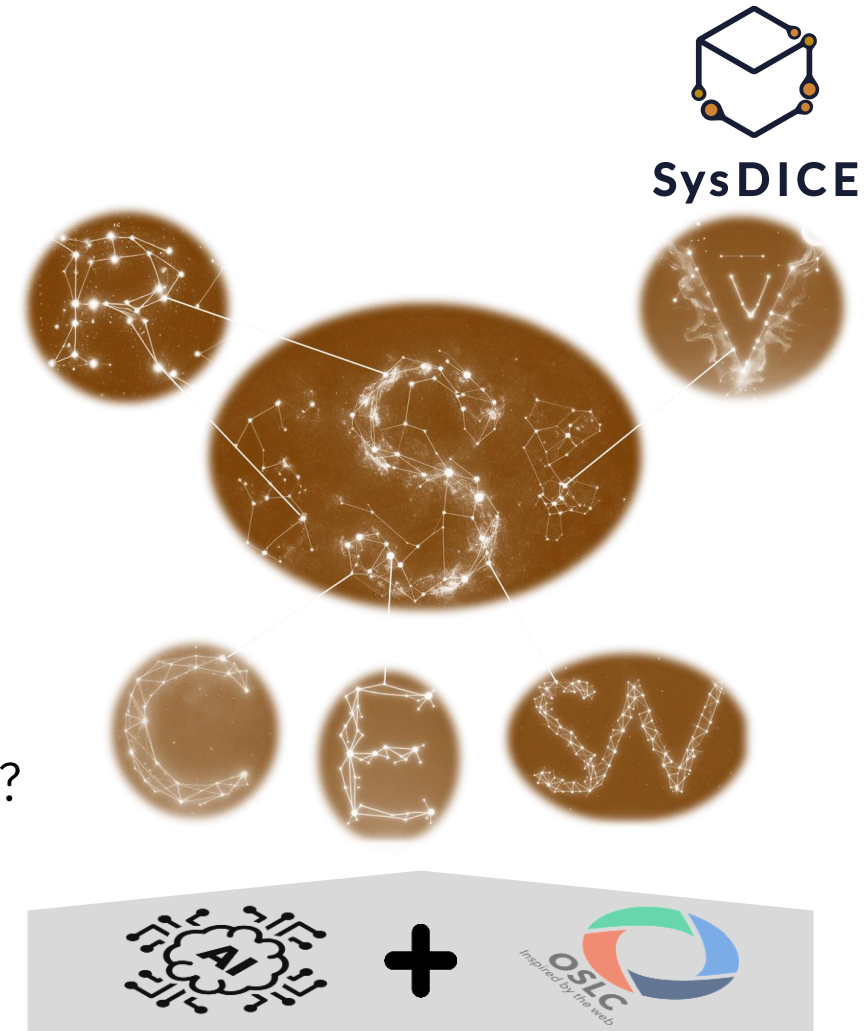
**WHICH DATA LINKING PROBLEMS ARE YOU FACING?**

Q3

# Using AI to Assist in Data Linking

*A set of guiding questions for workshop interaction*

1. How to automate **ontology** generation from existing data?
2. How to **manage elements'** access across tools?
3. How to **extract entities and relationships** from tools?
4. How to apply **semantic Interoperability** for linking?
5. What kind of **common data representation** is required?
6. Is **predictive linking** feasible?
7. How to **validate** automatic linking creations without human intervention?
8. How to **validate the business case** of the AI assistance?
9. How to **manage links' versions and configurations** between tools?



**CAN AI ASSIST IN LINKING DATA ACROSS DOMAINS?**

**Q4**

# Thank you and Summary

*Looking forward to the collaborative exploration awaiting us in the workshop*



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**CAN YOU THINK OF ANY OTHER ANALOGIES?**

**CAN AI ASSIST IN LINKING DATA ACROSS DOMAINS?**



**ARE THERE ANY OTHER TYPES TO DATA LINKING?**

**WHICH DATA LINKING PROBLEMS ARE YOU FACING?**