Which of these are you more likely to read in Summer 2021?

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Bar chart:
- Dante's "Inferno" (about Hell, 1321): 2
- Zweig's "Magellan. Der Mann und seine Tat" (about the first globe circumnavigation, 1521): 1
- Wittgenstein's "Tractatus Logico-Philosophicus" (about everything, 1921): 6
- OntoCommons' "Deliverable 3.9" (about this workshop, 2021): 15
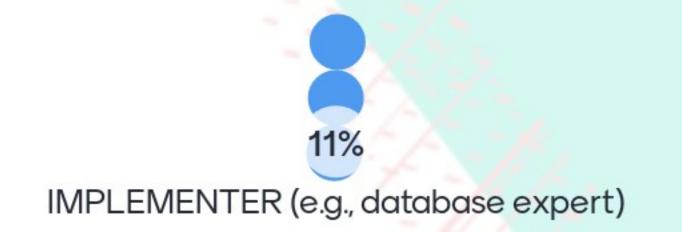
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In which role are you here today?

19% — ONTOLOGIST (e.g., philosopher, semantic web expert)

30% — M&M DOMAIN EXPERT (e.g., materials scientist)

11% — IMPLEMENTER (e.g., database expert)

22% — APPLICATION DEVELOPER

4% — END USER (e.g., manufacturer)

15% — OTHER

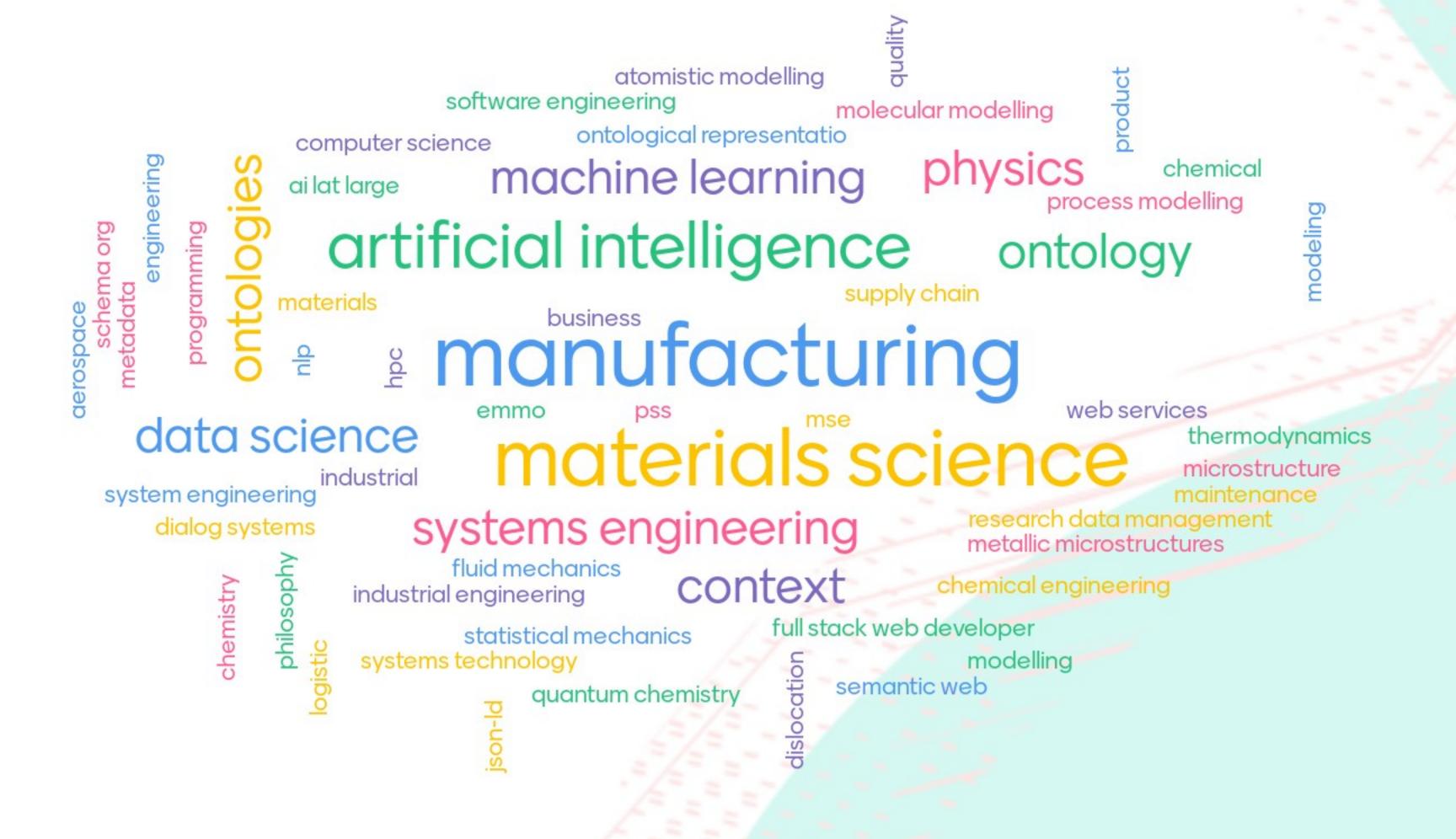UK Research and Innovation

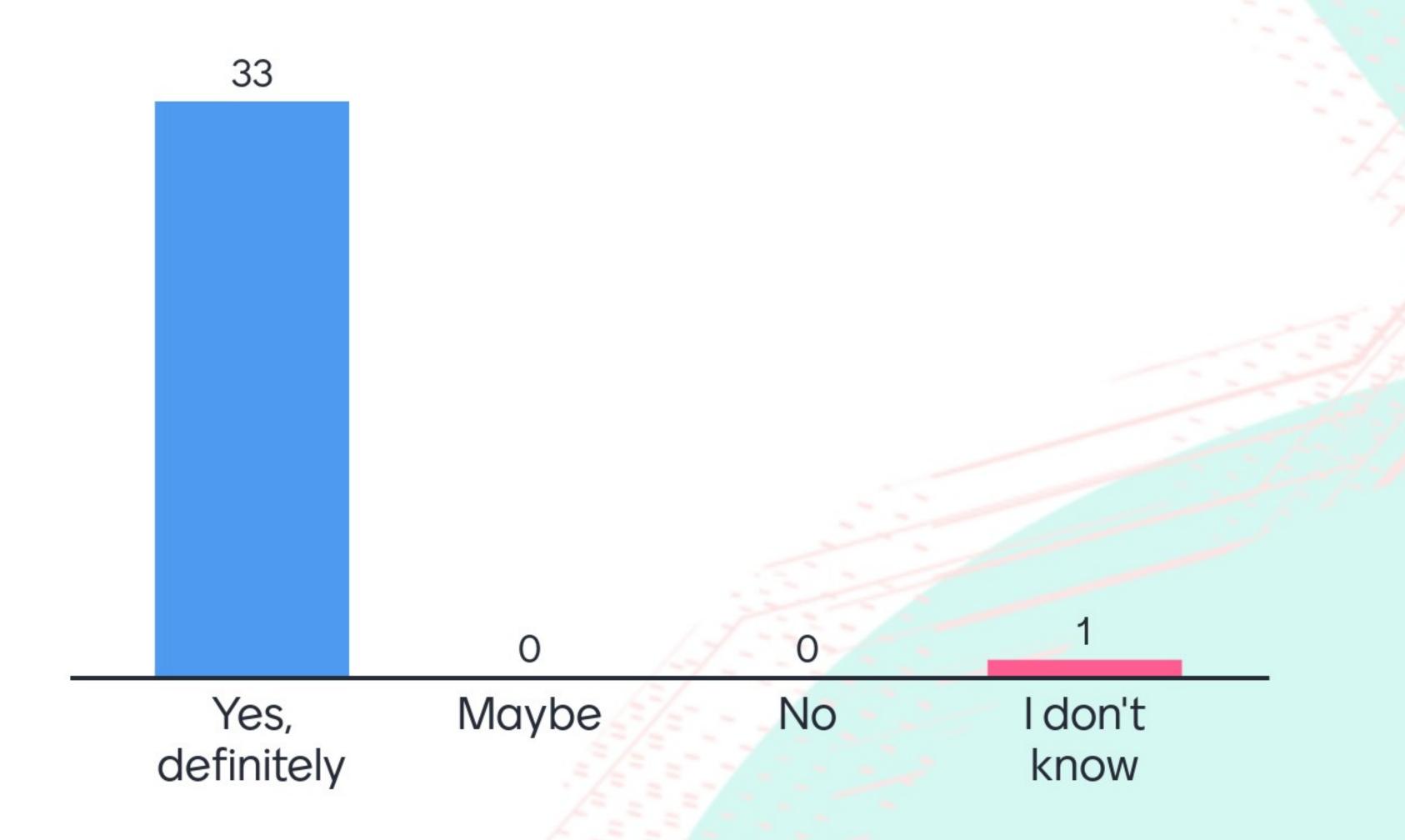# What are your main fields of expertise?

Would you benefit from an improvement of data integration, sharing and format conversion in your field?

In a nutshell, what is the data integration challenge you have?

Interoperability in practice

instrument formats

constructing research data infrastructures to be used by all academics in catalysis-related sciences and in engineering in Germany

using existing information in an homogenous way

coherence

Integrating data originating from different sources into a common, unified framework

Finding similarities between "materials". The very concept of "materials" is not defined in a machine-operable way, I would claim.

Common notation for Design processes and management of Information artefacts during manufacturing

various stakeholders

In a nutshell, what is the data integration challenge you have?

Interoperability in practice	detecting duplicate instances	Various sources of data
integrate legacy systems	Data conversion	heterogenous field of research
The meaning of data	Finding all the right data to integrate	Different data formats

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In a nutshell, what is the data integration challenge you have?

Simulation setup

integrating different digital twins

Attaching and combining databases, multi-disciplinary multi-scale simulations. So interoperability as the main issue.

Differences in semantics. Lack of useable and useful data

Planning and scheduling in the industrial field. Supply chain

Different data formats

Knowledge representation in the field of MSE

heterogeneity

Ontologies to define software deeper "business logic" aspects.

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In a nutshell, what is the data integration challenge you have?

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Integraring data from different scale

A holistic material model: Findings achieved with several experimental/research tools for the same material sample, but implicitly assessing different material spatial regions and behaviour ...

Jfr

First the context between industrial engineering and ontologist engineering, and second the background knowledge inter this fields to each member in the team
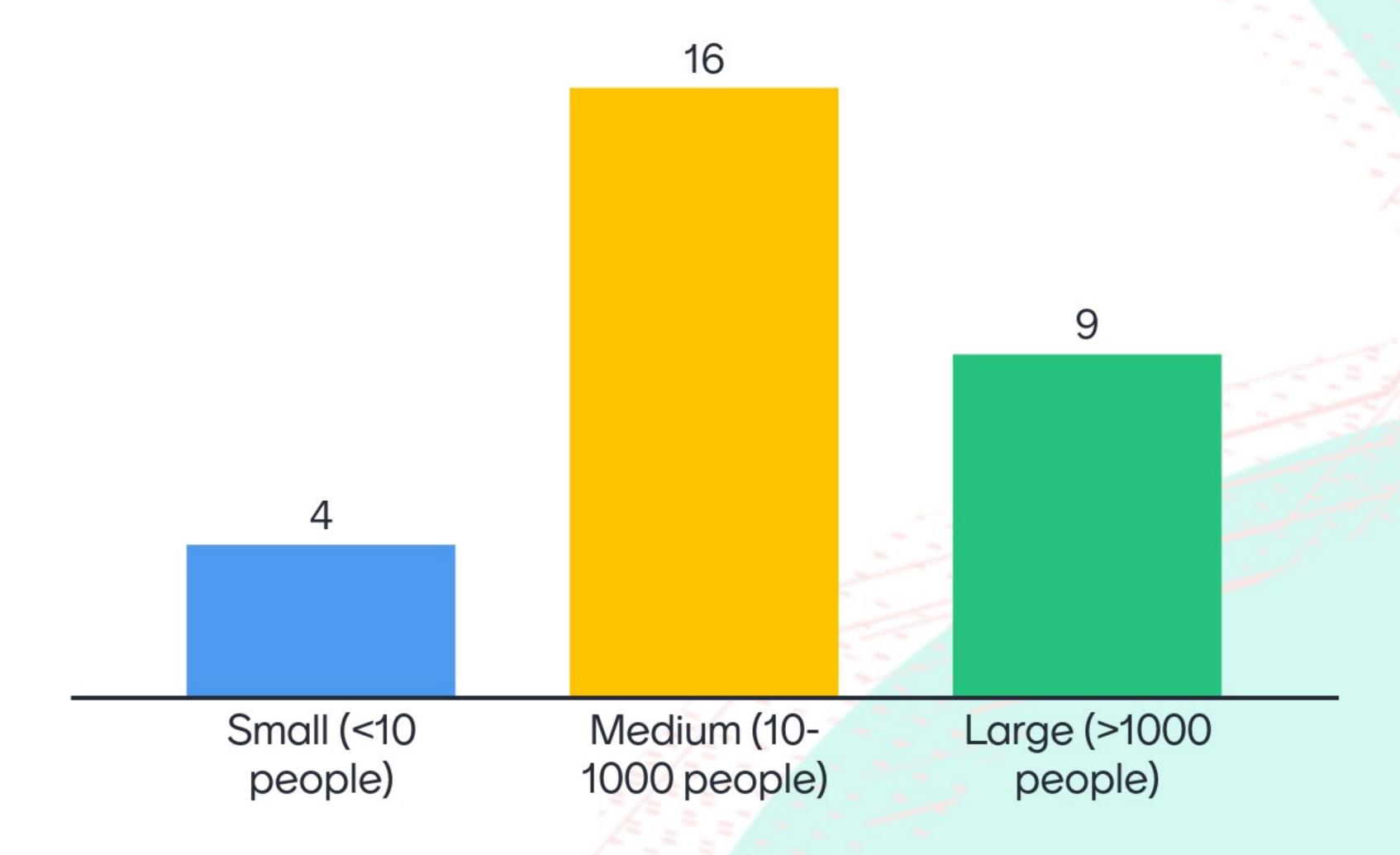
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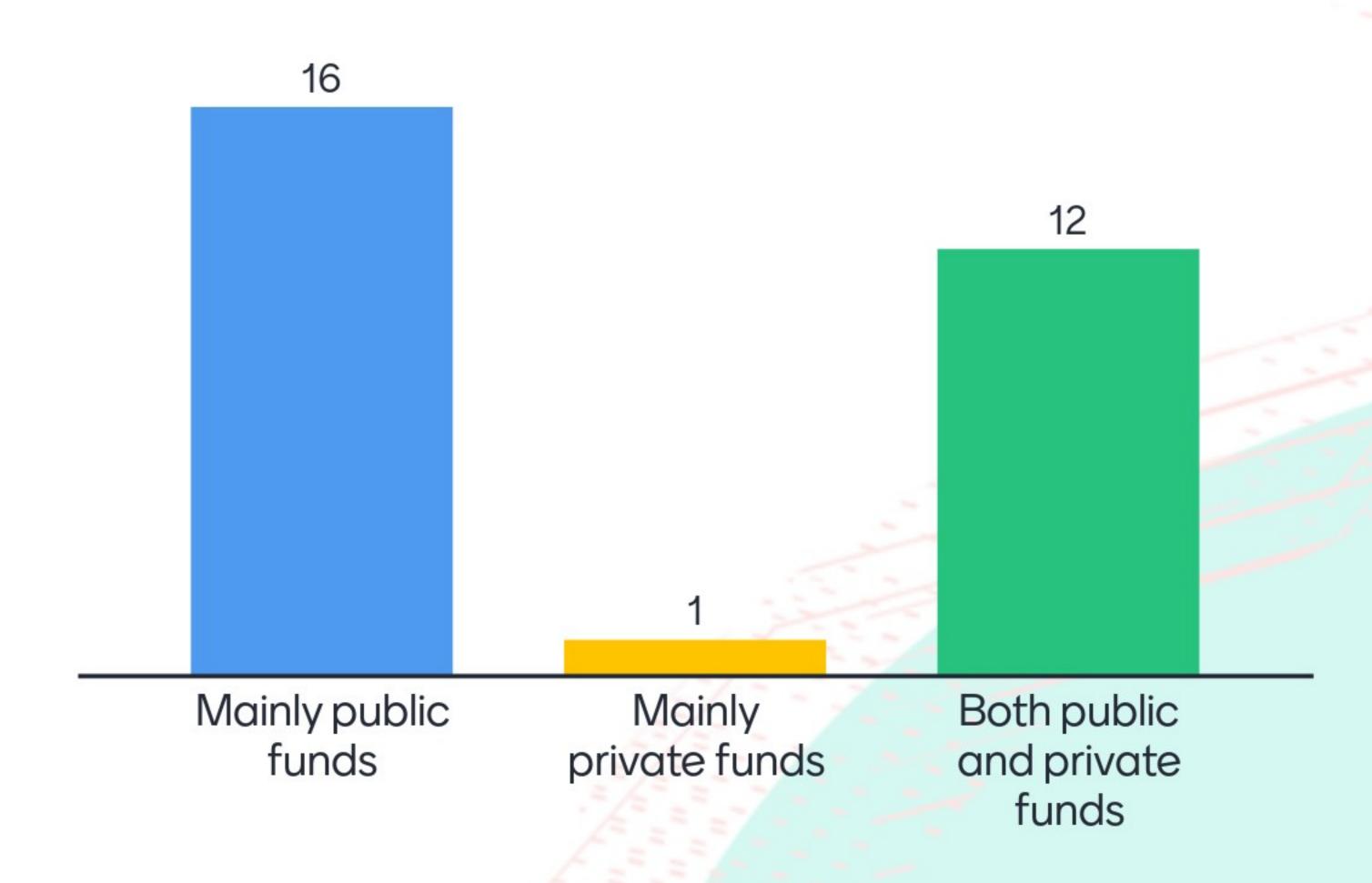
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Your institute/company is

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What funding type does your institute/company rely on?
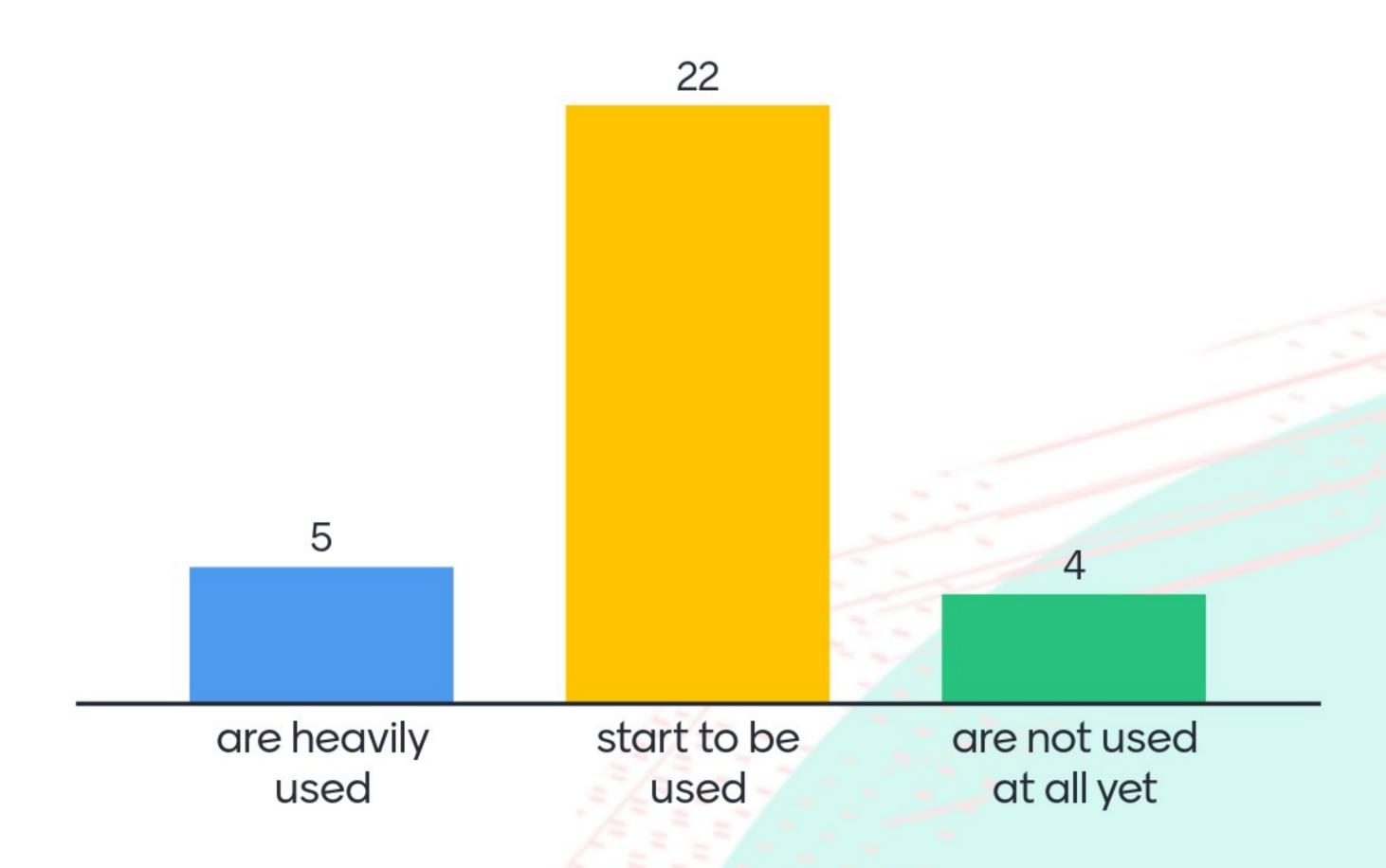
In your institute/company, semantic technologies ...

| 5 | 22 | 4 |
| are heavily used | start to be used | are not used at all yet |

What would you recommend as a first step to a M&M expert who would like to introduce semantic technologies in their work?

start small

It's the metadata!

Look for shared definitions about what objects of your domain are (e.g. what's a molecule? what's a car?). It's a huge pre-formal-ontology barrier.

Provide a report about how data are generated

Try to understand the meaning of his/her data.

demonstration of concrete incentives

use existing tools

define clear objectives and deduce clear requirements - know what you want

Define a purpose (incl. few purposes) for the planned ontology

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What would you recommend as a first step to a M&M expert who would like to introduce semantic technologies in their work?

Collaboration with experienced users

to participate in ontocommons

Determine applications in which interrelations between data are crucial.

Use existing ontologies

To recognize which are the data sources and sinks and recognize their meanings

Show the application of their approach.

Identify very well the objective

Explore a set of ontologies and find the common parts. Analyse the methods and what it "does".

Provide basic training to process engineers on ontology development to begin teamwork with ontologists

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What would you recommend as a first step to a M&M expert who would like to introduce semantic technologies in their work?

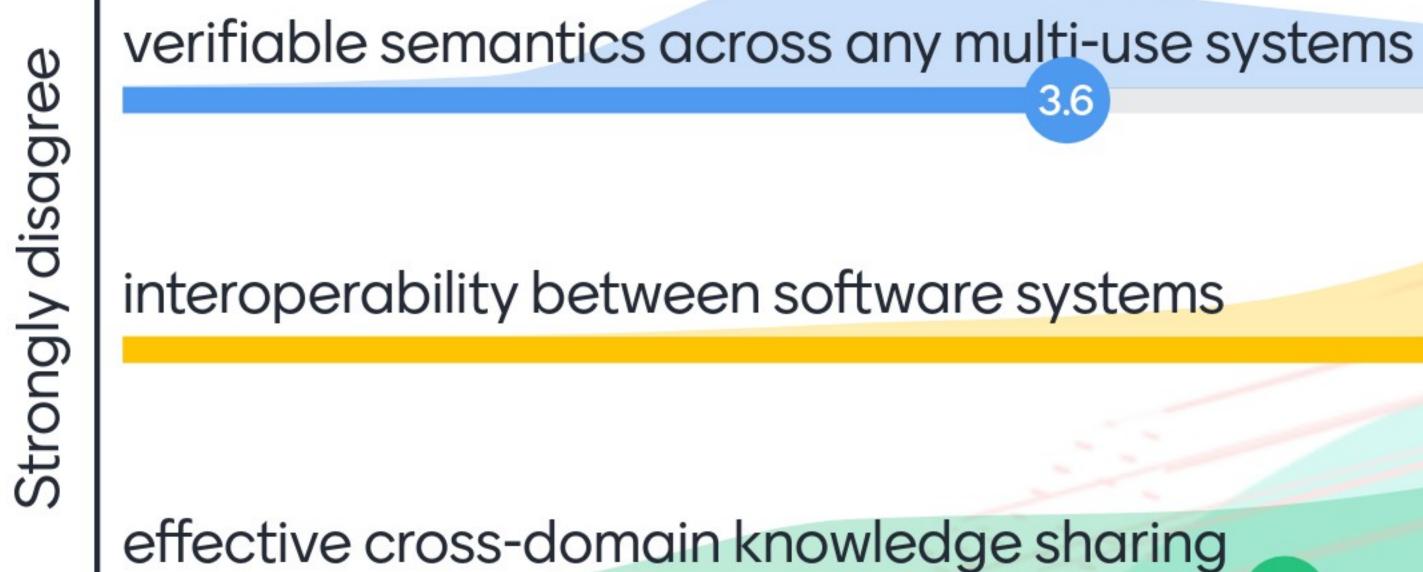|		
Conduct requirement analysis	Allocate a budget!	Consider TLO from the start
Provide basic training to process engineers on ontology development to begin teamwork with ontologists	Define the questions he/she wants to answer with the help of decision support systems.	use only as much semantics as necessary to meet objective
clear objectives	Think about your colleagues, join forces!	Institutionally backed standards

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What would you recommend as a first step to a M&M expert who would like to introduce semantic technologies in their work?

solving specific case studies for companied

Why do we want formal ontologies? For...

Strongly disagree ... **Strongly agree**

- verifiable semantics across any multi-use systems — 3.6
- interoperability between software systems — 4.7
- effective cross-domain knowledge sharing — 4.2

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When developing a domain ontology:

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Strongly disagree — Strongly agree

One should use a top-level ontology — 3.8

It does not matter if it is stand-alone — 2.5
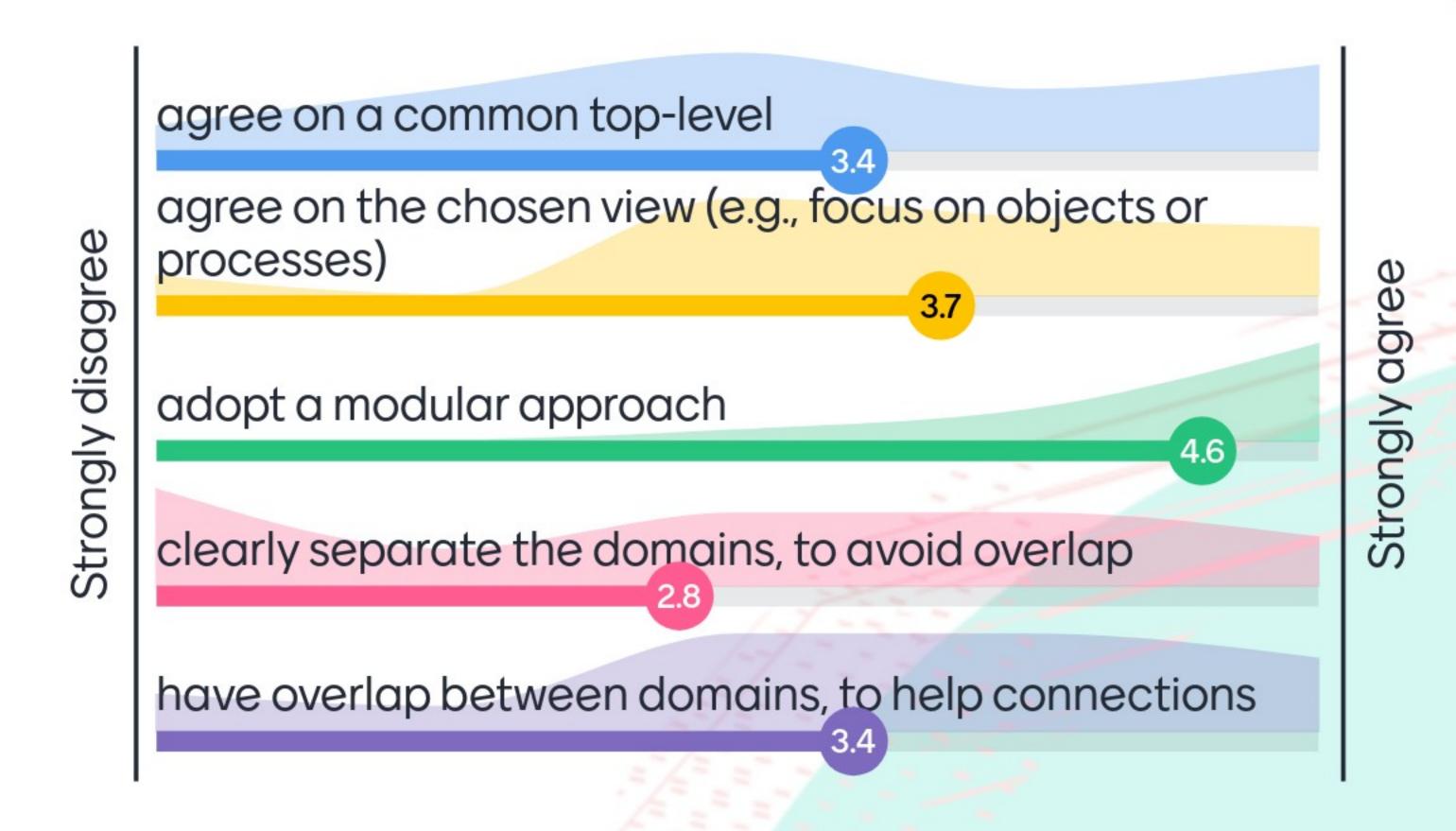
One should ensure it can be used by other ontologies — 4.1

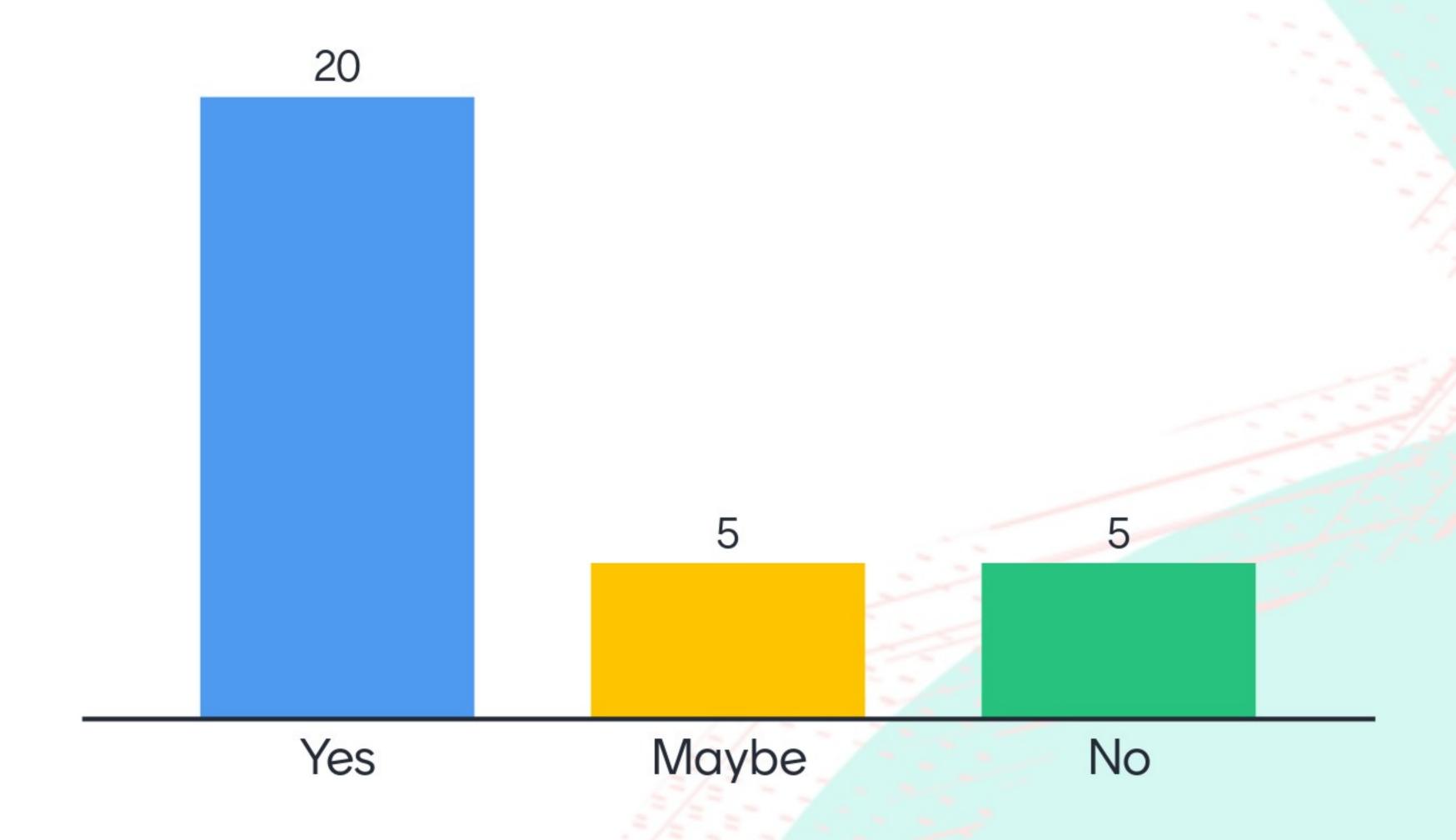I typically use ontology design patterns — 2.9

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When developing domain ontologies we should:
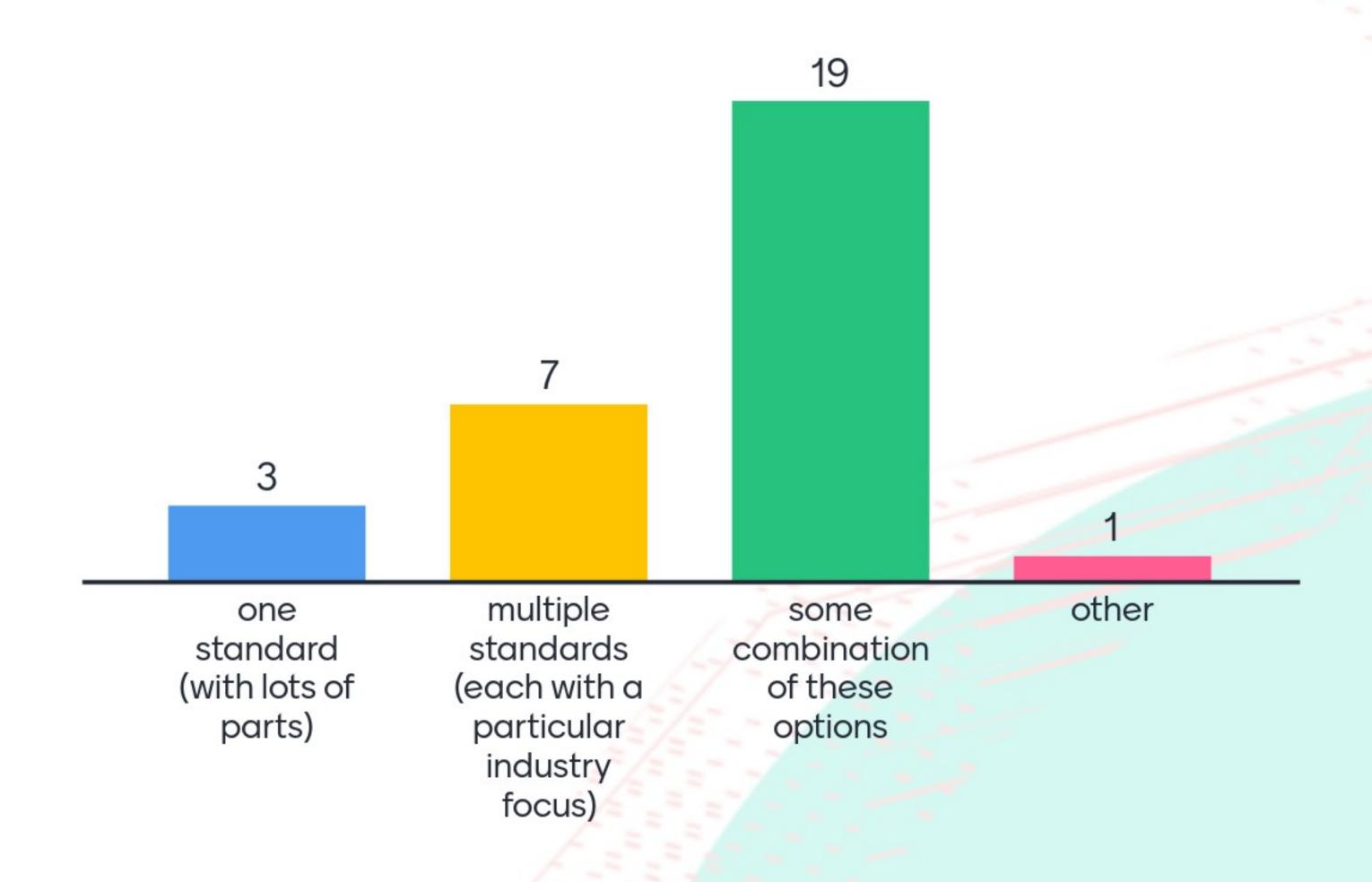
Do we need formal standards (as ISO ones)?

Assuming we need standards, how should these be structured?

How do we fund the process of taking valuable research results to the level of formal (ISO-like) standards?

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forming associations with membership fees and donations

Demonstrating value to the industrial users

Needs EU funding and needs to be sustained.

academic institutions should receive sufficient basic funding from governments to be able to do their job

EU grants

Public funds + participation of experts from industry.

Sustained EU funding

Build it into larger projects. Sustainability is important

To form associations involving industrial partners

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How do we fund the process of taking valuable research results to the level of formal (ISO-like) standards?

Issue is to document the return of value. A classical bootstrap problem. Public funding to start with.

Demonstration may be publically funded.Individual implementation is private interest.

Forming associations that seek EU funds

Public driven with and private advisors, through EC funded associations.

Mediante asociaciones e incluso proyectos de desarrollo económico internacional, pues es la interoperabilidad que permiten es un principio de Industria 4.0 (since my vision as Industrial-Quality Engineering)
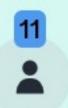
We highlight the need for data acquisition and join with colleagues doing characterisation of materials that are of particular interest (already today).

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At time t, a headlight bulb is installed in a certain car. At time t'>t the bulb is replaced with another. How many headlight bulbs are there?

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2	1	1
At least two	2	Three. One functional, two installed
0	It depends what "are there" means.	2 one that is installed, one replaced

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At time t, a headlight bulb is installed in a certain car. At time t'>t the bulb is replaced with another. How many headlight bulbs are there?

| as many as were installed in t=t`-t | I do not know.As much as at t" < t !? |