

Collection of data and monitoring the efficacy of Risk Mitigation Measures in



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Predictive Models and Tools for Risk assessment of Nanotechnology

How to make a comprehensive evaluation or Risk Mitigation Measures, including Safer by Design Strategies, in a quantitative way?





Establish a nano-risk governance framework for assessment and management of human and environmental risks of manufactured NM and nano-enabled products, during all the life cycle stages (LCS).

Approach: harvesting and implementing results from state-of-the-art research on risk governance (risk assessment, management and communication). Develop, improve, integrate nano-specific models and methods into a System of Systems (SoS).

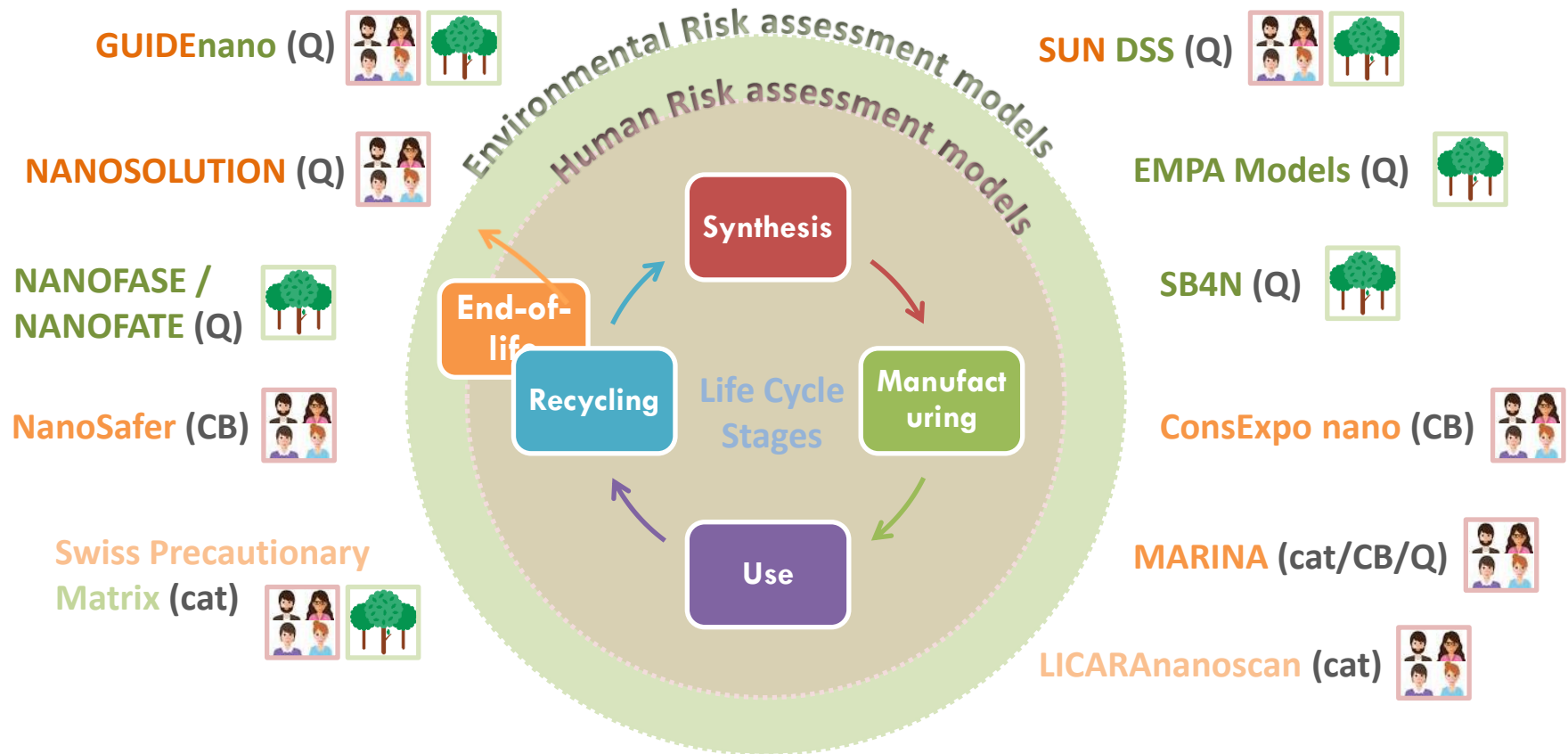


Target: research organizations, companies, insurers authorities and other stakeholders involved in research, prioritization and management of occupational, consumer and environmental risks of NM.

Ambition: quality and trust in the caLIBRAte framework models

Predictive Models and Tools for Risk assessment of Nanotechnology

Develop, improve, integrate NM-specific models and methods into a System of Systems (SoS).



Predictive Models and Tools for Risk assessment of Nanotechnology

What the RA Models and Tools are?

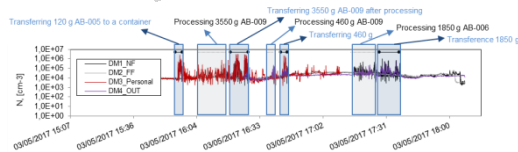
- Simplified representation of a system
 - Softwares



Predictive Models and Tools for Risk assessment of Nanotechnology

What the RA Models and Tools do?

- How NMs reach target “compartment” -> EXPOSURE
- Where NMs distribute and in which concentration -> TRANSPORT, DISTRIBUTION and FATE
- What NMs do? -> HAZARD



INPUT: Real Data

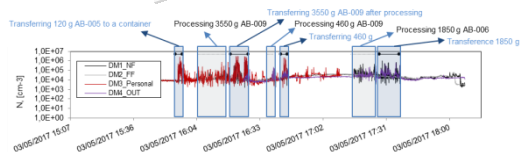


OUTPUT: Predicted Data

Predictive Models and Tools for Risk assessment of Nanotechnology

Are RA Models and Tools making good predictions?

- Are experimental and predicted data comparable?
- Are results from different models comparable?



INPUT: Real Data



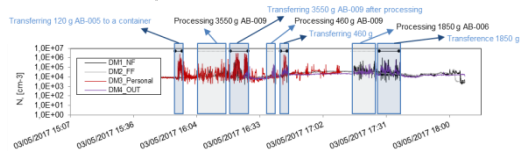
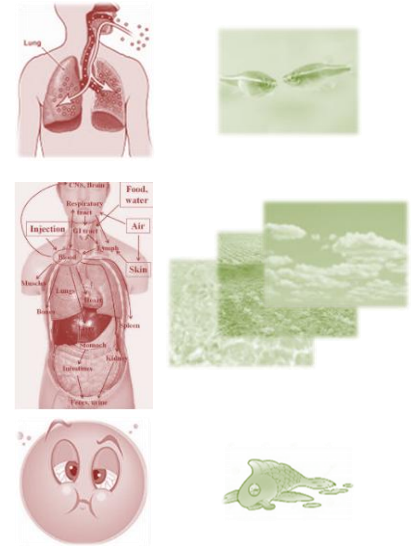
OUTPUT: Predicted Data

Predictive Models and Tools for Risk assessment of Nanotechnology

Are Models and Tools making good predictions?

- Are experimental and predicted data comparable?
- Are results from different models comparable?

Models tested and calibrated



INPUT: Real Data



OUTPUT: Predicted Data



YES

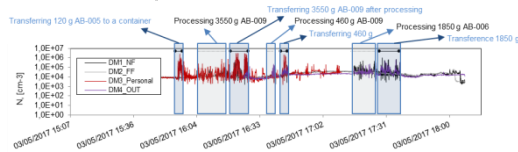


Predictive Models and Tools for Risk assessment of Nanotechnology

Are Models and Tools making good predictions?

- Are experimental and predicted data comparable?
- Are results from different models comparable?

Models refinement, more data needed



INPUT: Real Data



OUTPUT: Predicted Data



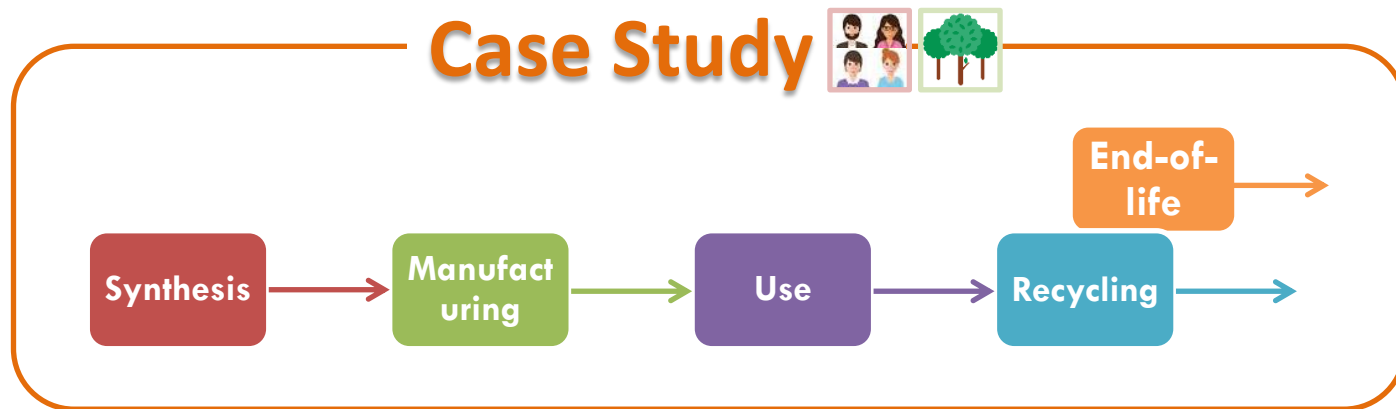
NO



Data collection for models calibration and testing

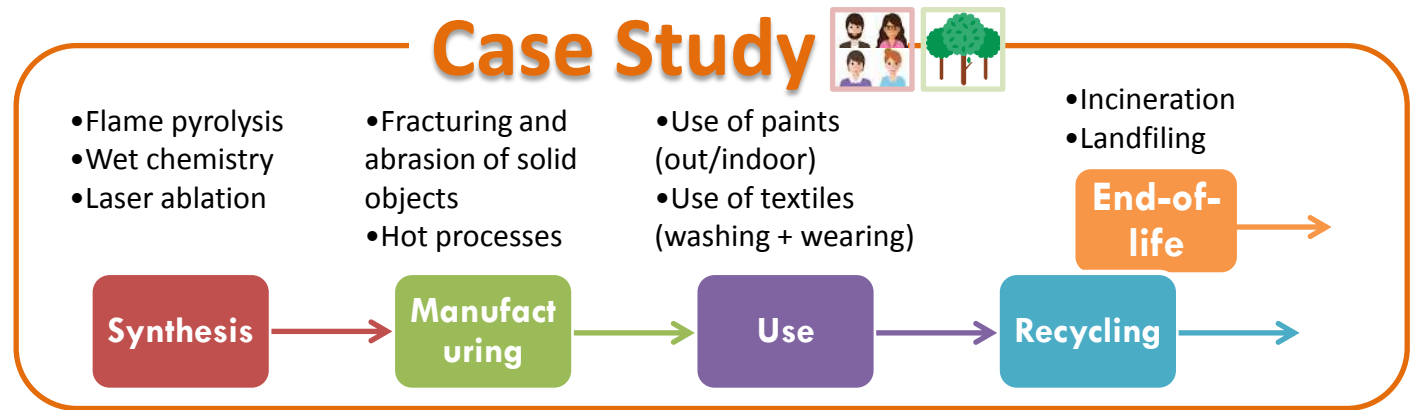
Which data are needed?





- NMs characterization, exposure data, eco and human toxicity data, environmental release, ...
- **Comprehensive inventory of existing and new value chain case studies from EU Project and literature, focusing on environmental and human exposure data**
- Collection and categorization of case studies (e.g. LCS, phys-chem data available, stage gate...)
- Gap analysis and data quality according to caLIBRAte Tools



Data collection for models calibration and testing

Existing case studies

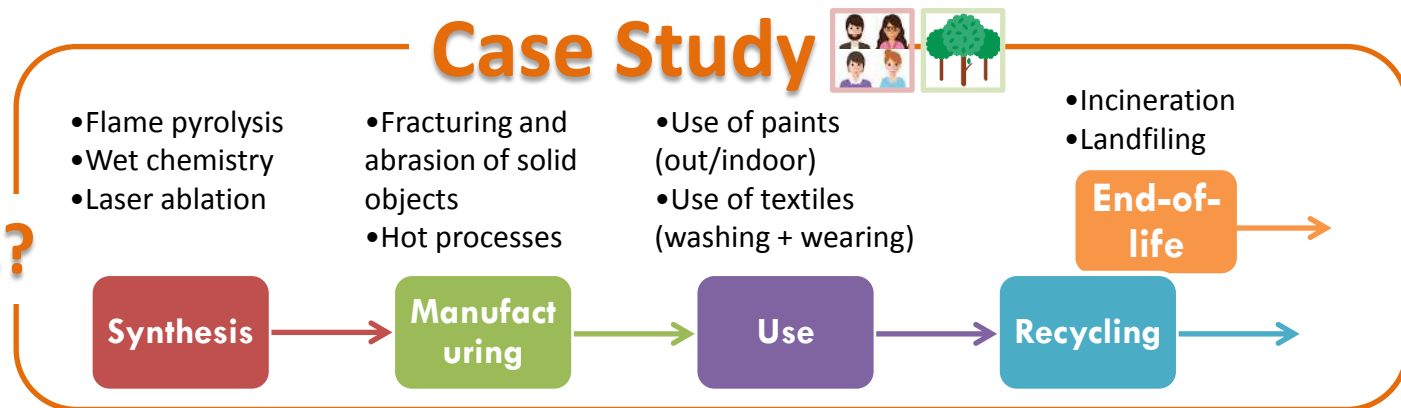






Exposed				
Worker	INDOOR MEASUREMENT (Occupational Exposure)		USE SIMULATION (Worker exposure)	INDOOR MEAS. (Occup. Exp.)
Consumer	Not relevant	Not relevant	USE SIMULATION (Cons. exposure)	Not relevant
Environment	OUTDOOR MEASUREMENT (Release to environment)		USE SIMULATION (Rel. to environ.)	OUTDOOR MEAS. (Rel. to environ.)

Data collection for models calibration and testing

Gap analysis of inventoried case studies

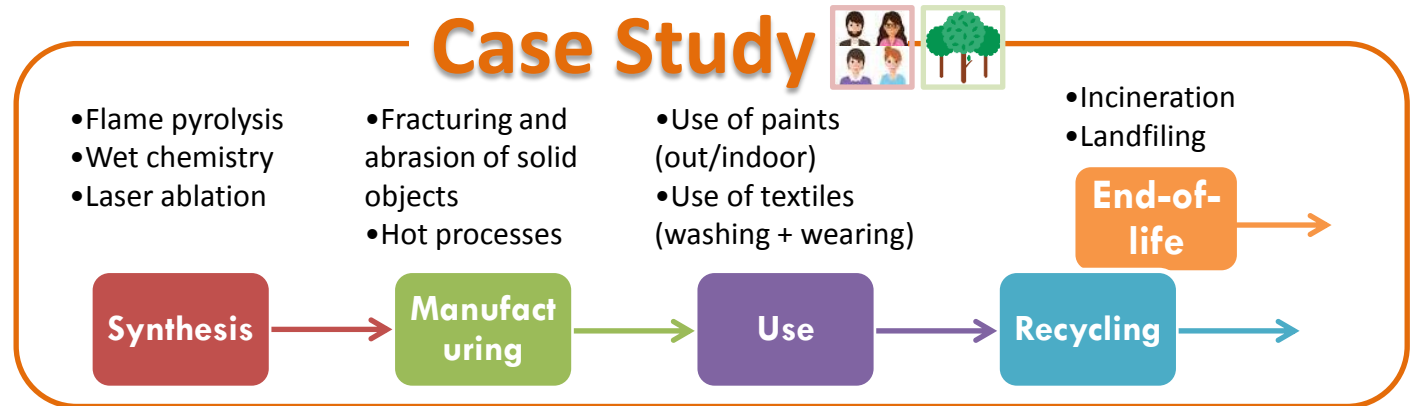
Quality?
Completeness?



Exposed				
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Data collection for models calibration and testing

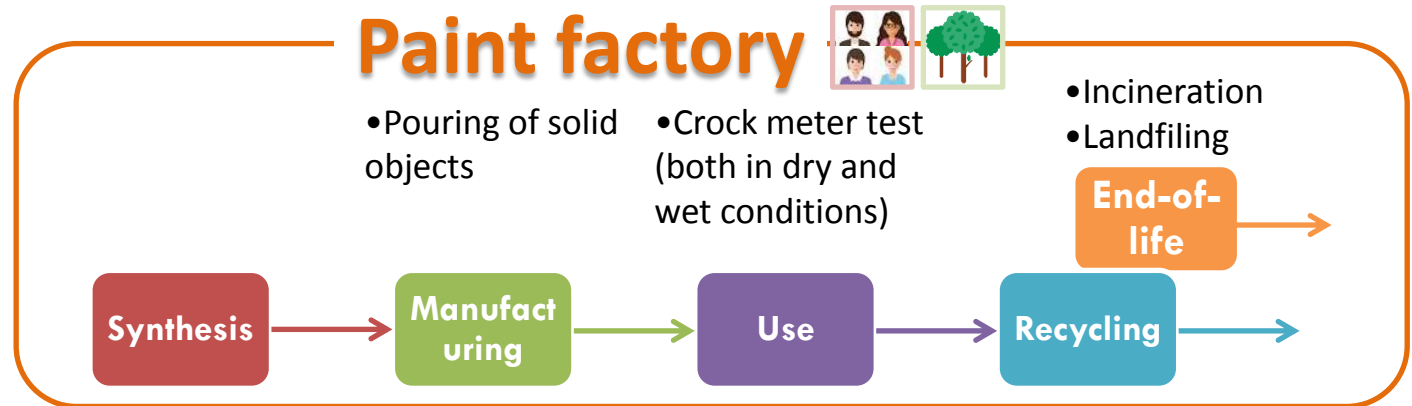
Data collection for performance and calibration testing: Existing case studies




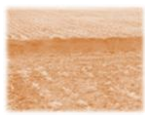


**Quality data set and parameters collected
and available for model use**

Data collection for models calibration and testing

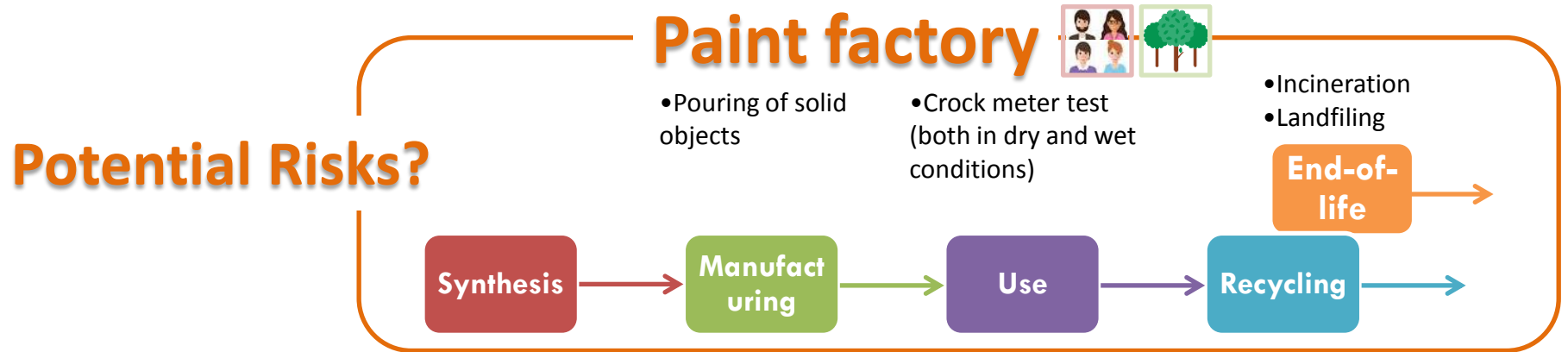
Data generation for performance and calibration testing: New case studies







Exposed				
Worker	INDOOR MEASUREMENT (Occupational Exposure)		USE SIMULATION (Worker exposure)	Not performed
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Data collection for models calibration and testing

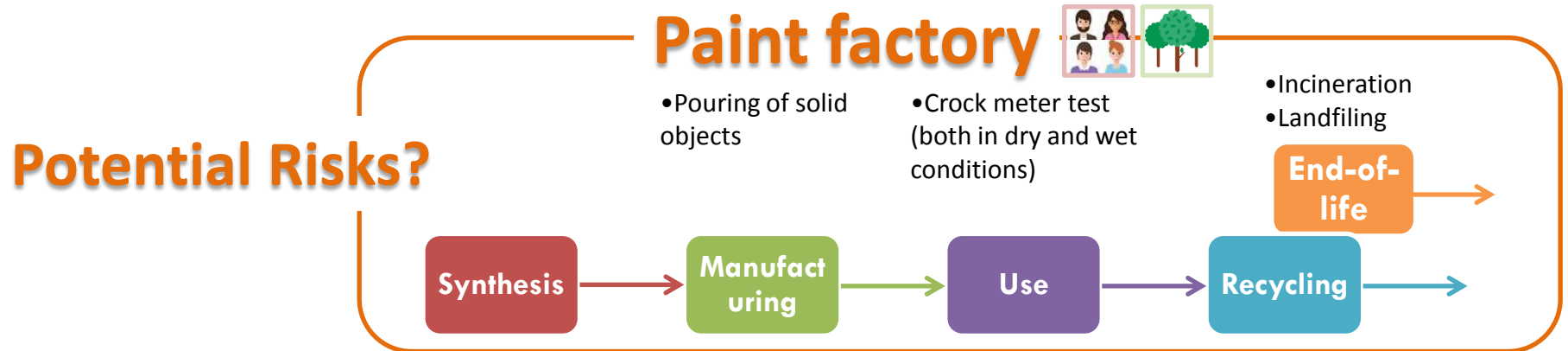
Data generation for performance and calibration testing: New case studies



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Data collection for models calibration and testing

Data generation for performance and calibration testing: New case studies



Some of the models have the option test RMM:

- safer-by-design,
- engineering controls,
- administrative controls,
- PPE



Compare a before/after situation allowing to make a comprehensive evaluation or RMM, including Safer by Design Strategies, in a quantitative way.



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Comments and questions

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