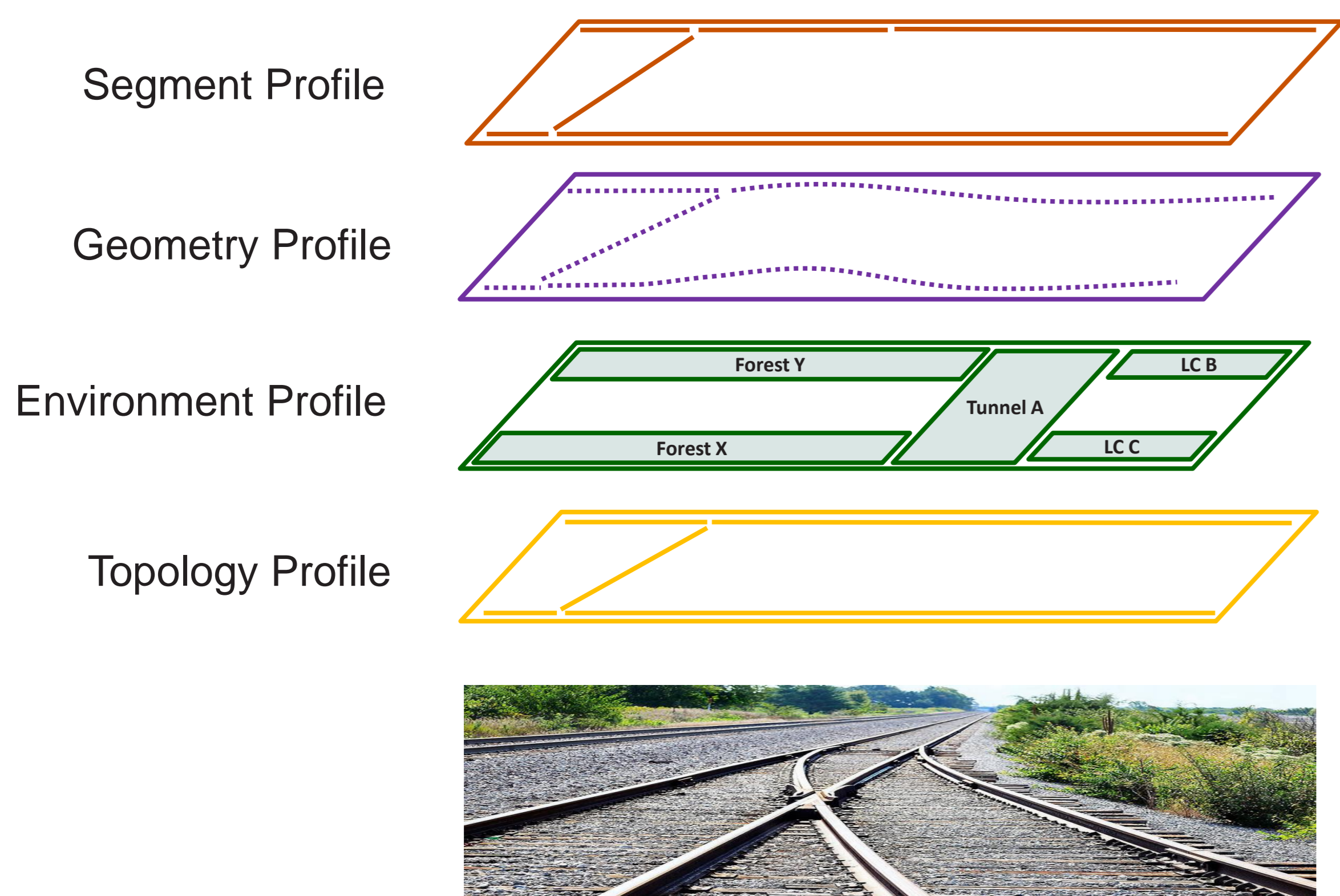


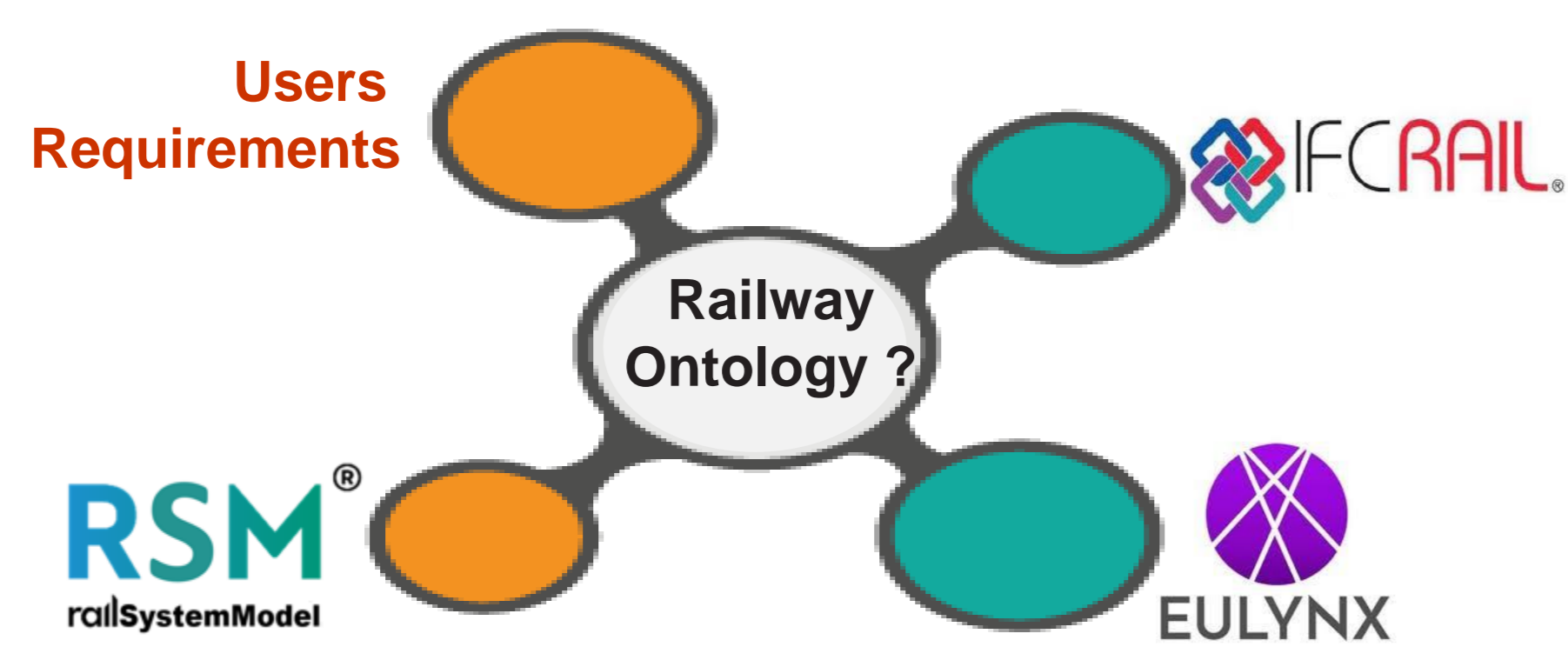
Towards Digital Transformation of Railways : Methodology and Applications

Nadia CHOUCANI & Sana DEBBECH

OVERVIEW

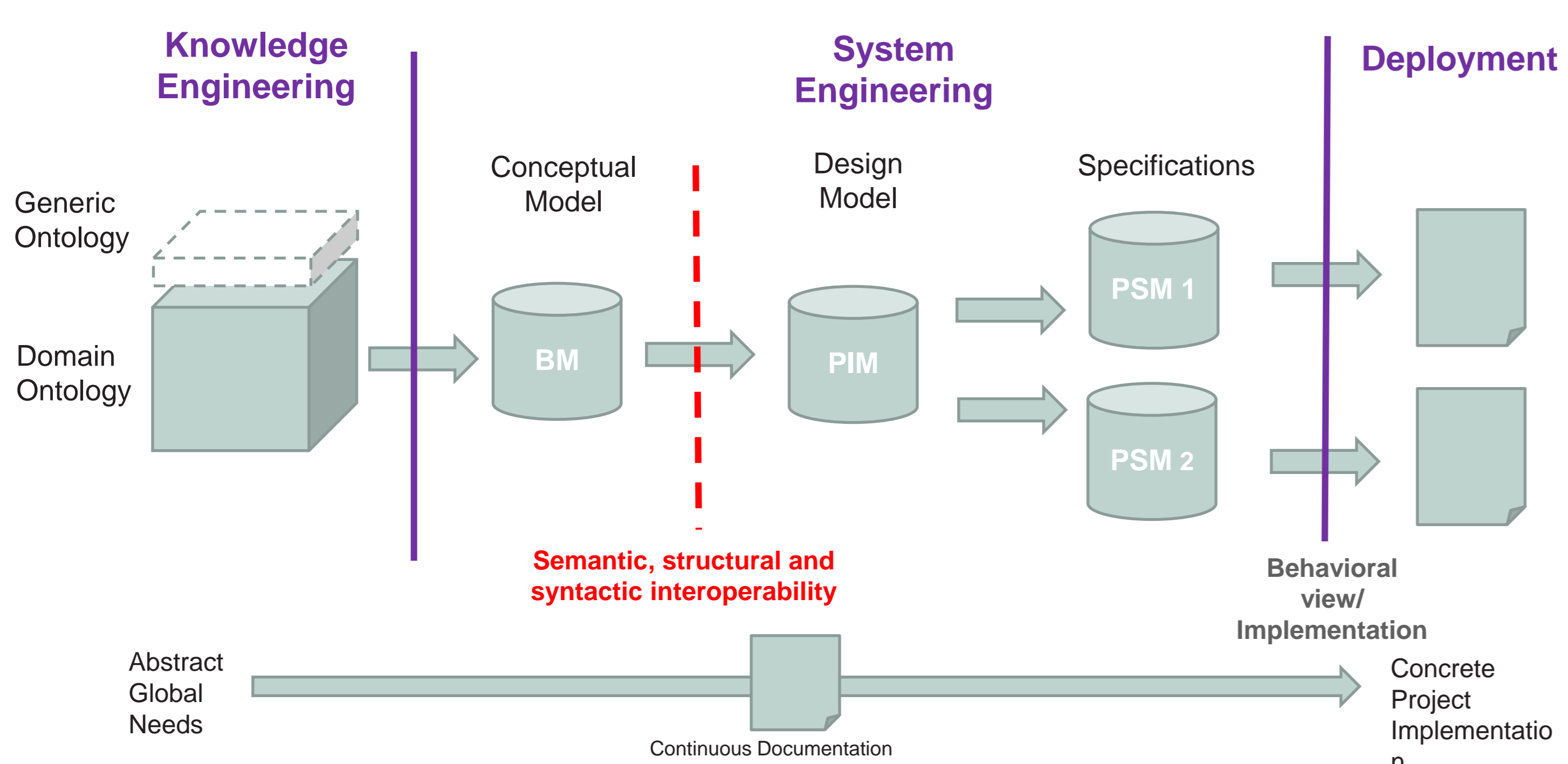


Research Question : How to share digital infrastructure information in an unambiguous way and on demand?



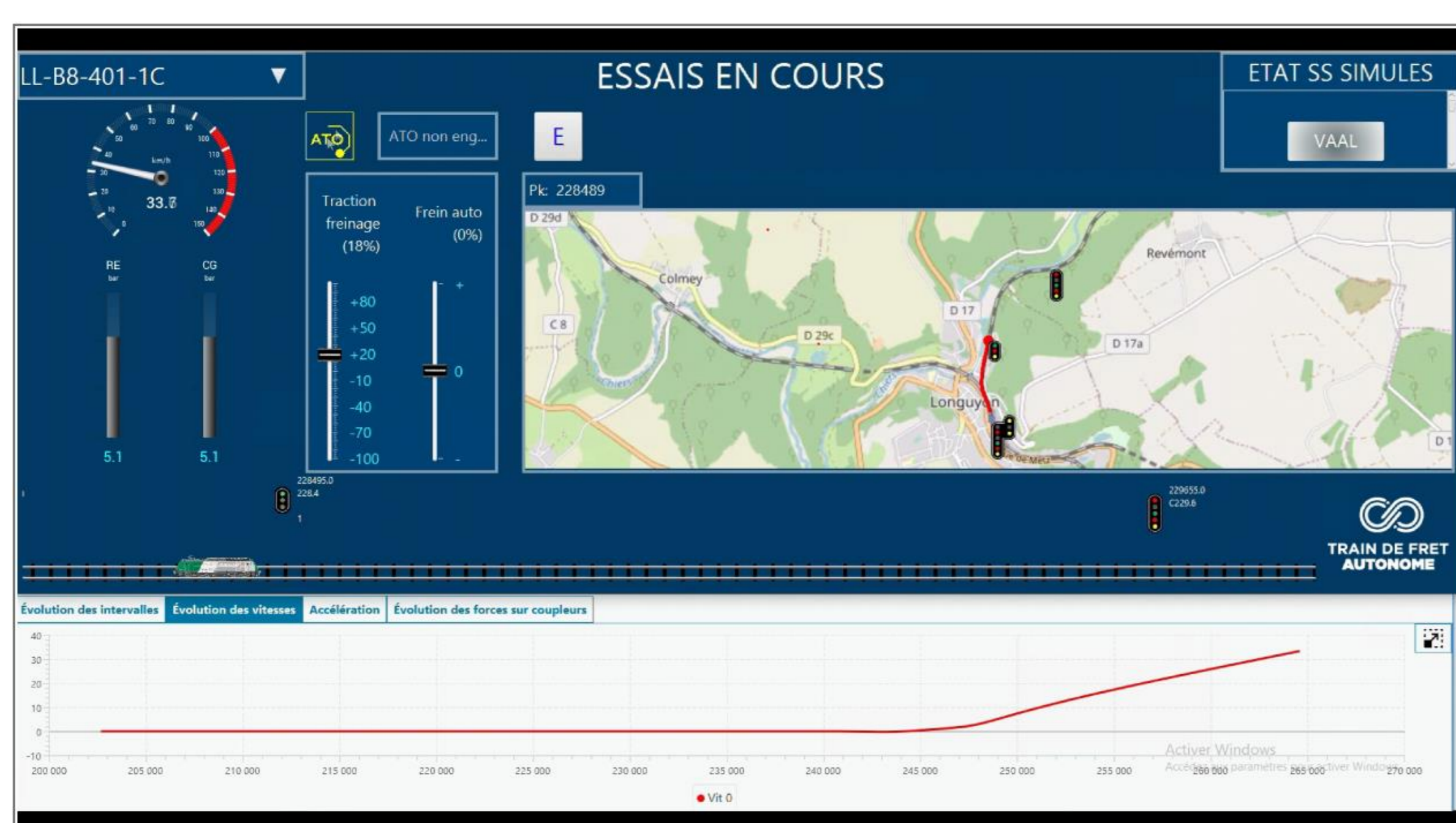
METHODOLOGY

MBSE: “the formalized application of modeling to support system requirements, design, analysis, verification, and validation activities beginning in the conceptual design phase and continuing throughout development and later life cycle phases”. [1]

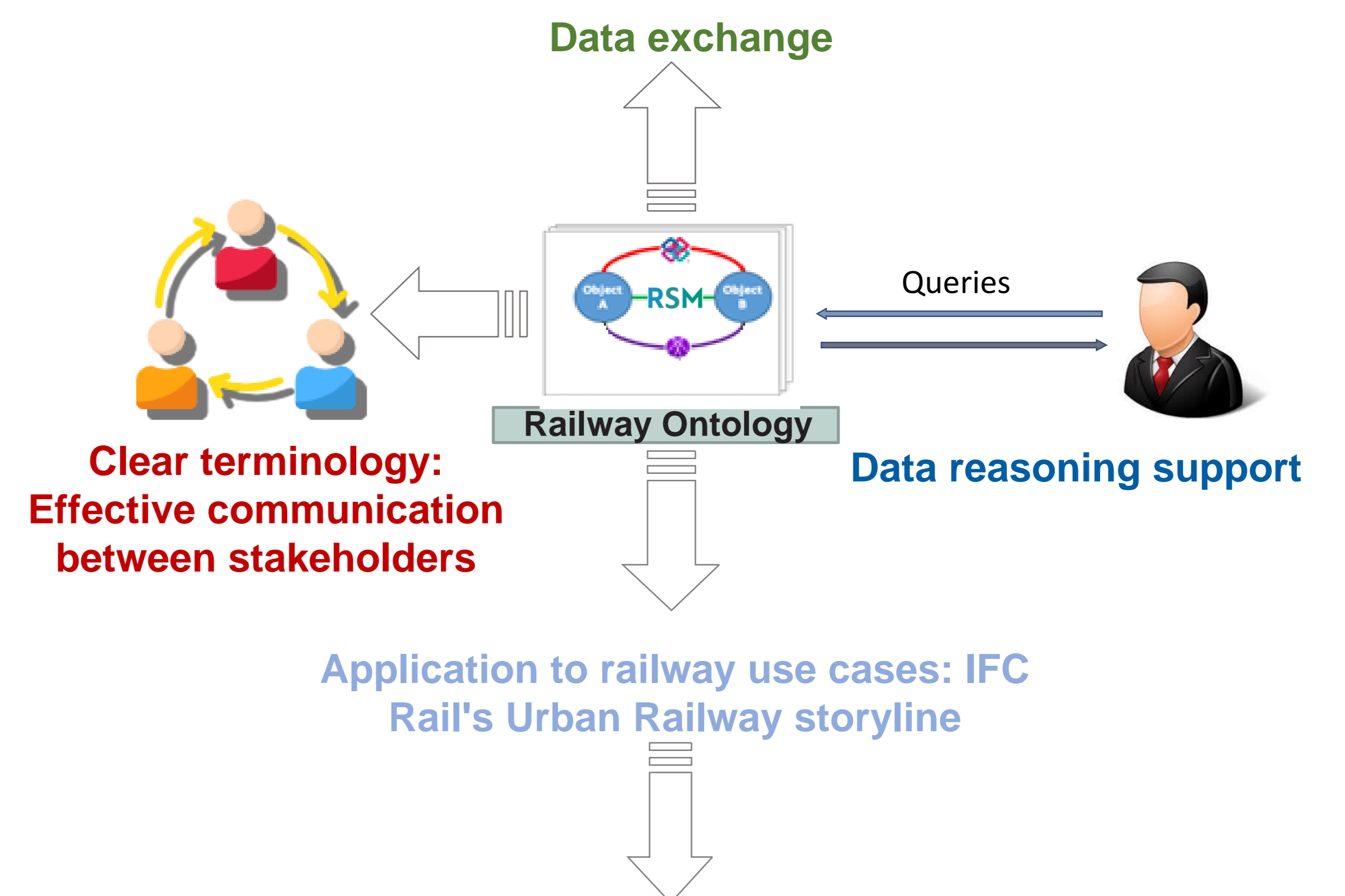


APPLICATIONS

1- Autonomous Train Map [2]



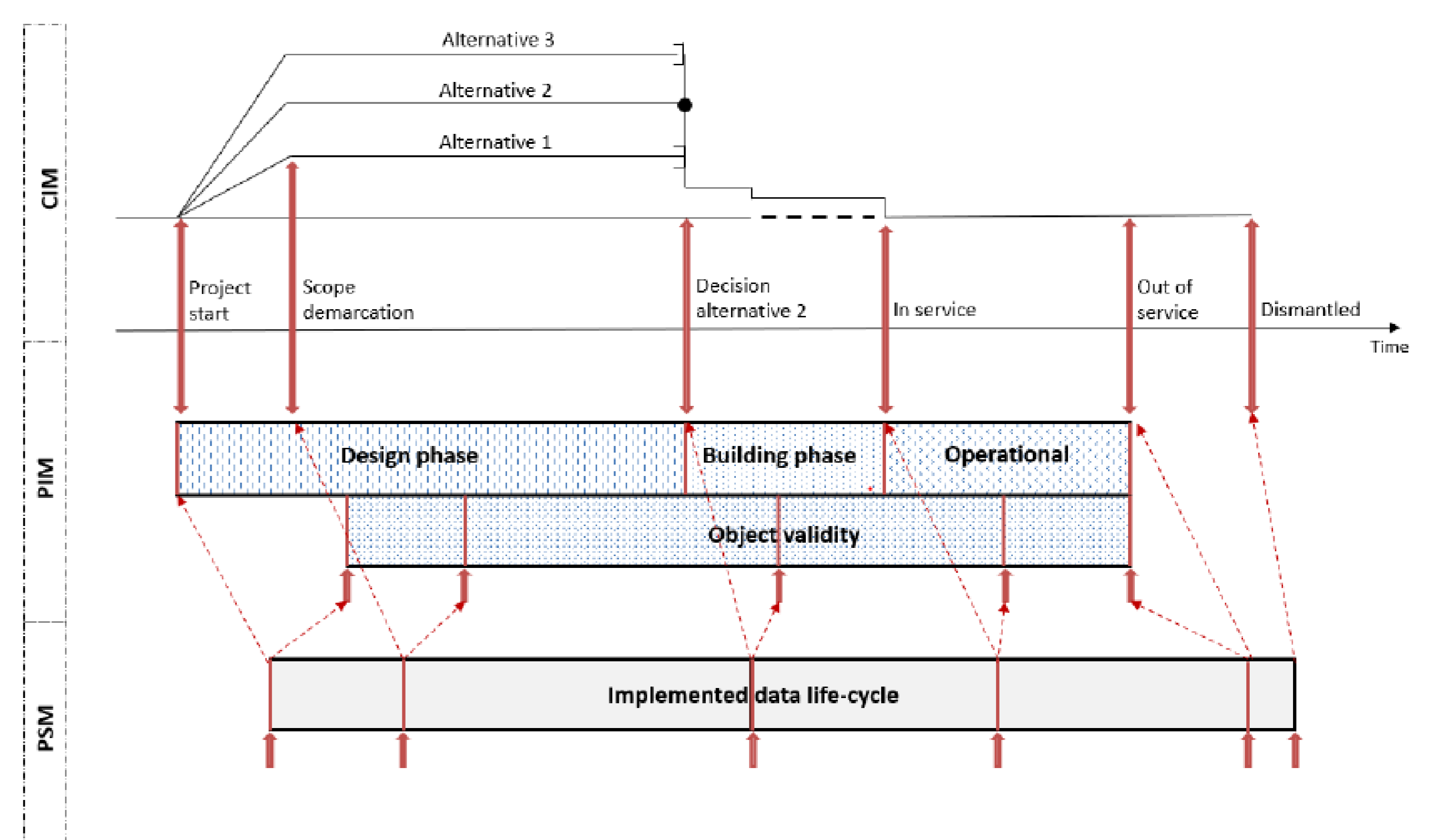
2- Railway Standards Alignment Ontology



3- Digital Rail Platform



4- Objects Lifecycle Modeling [3]



CONCLUSION

Digitalization is an ongoing process of convergence between the physical and virtual worlds. This transformation process is a paramount in the development of RAILWAY 4.0, a rail transport at the heart of a new economy of smart, environment and user-friendly mobility systems. MBSE is a key factor in the creation of added value and competitive advantage in this digital transformation.

REFERENCES

- [1] AWS (2021). Model Based Systems Engineering (MBSE) on AWS: From Migration to Innovation [White paper].
- [2] N. Chouchani, S. Debbech, M. Perin (2022), Model-based safety engineering for autonomous train map, Journal of Systems and Software, Volume 183,
- [3] N. Chouchani, S. Debbech, A. Magnien (2021), Life-cycle Modelling for Railway Infrastructure: Application to Autonomous Train Map.