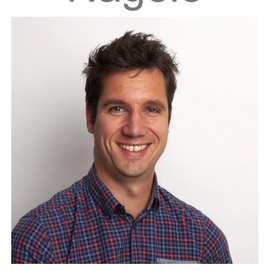
TNO ESI
Powered by industry and academia

Thomas Nägele



Pierre America

Marco Vicari

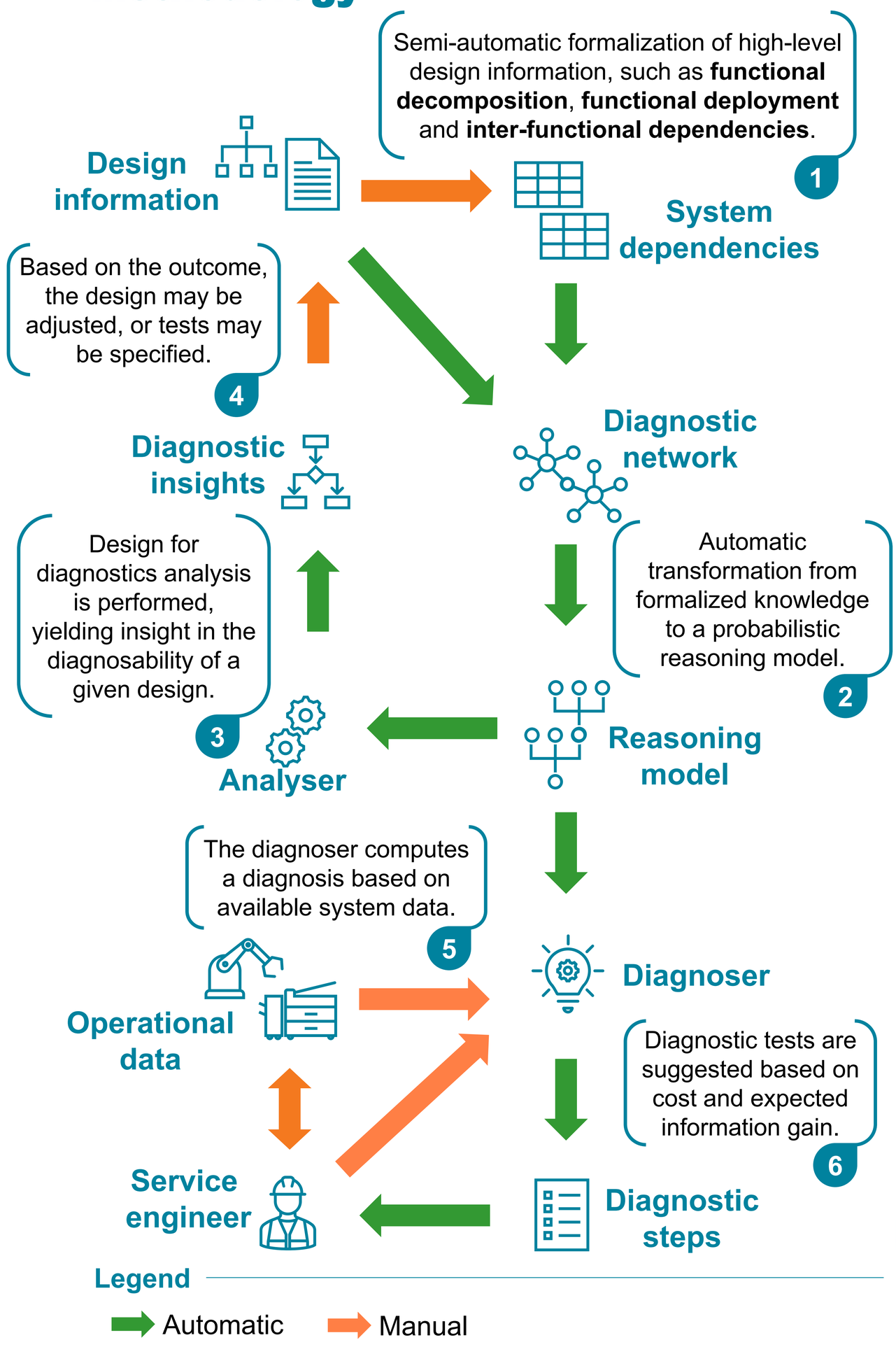
Scalable Intelligent System-level Diagnostics

Leveraging MBSE techniques for effective diagnosis

Introduction

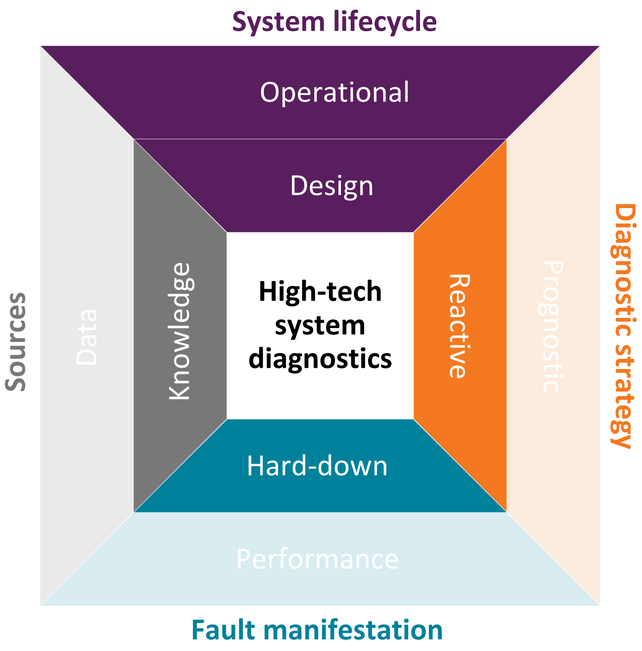
The increasing complexity of high-tech systems inherently requires well-trained, skilled service personnel to diagnose and maintain the equipment. Shorter time-to-market and scarcity of personnel challenge service departments in being able to cope. **Intelligent diagnostic assistants** are needed to effectively scale up and ensure uptime of high-tech systems. Especially shortly after introduction of a **new product** and for **rare incidents**, there is insufficient data available to successfully apply data-driven approaches. Therefore, we propose to formalize the available **design information** and use it for diagnostic reasoning

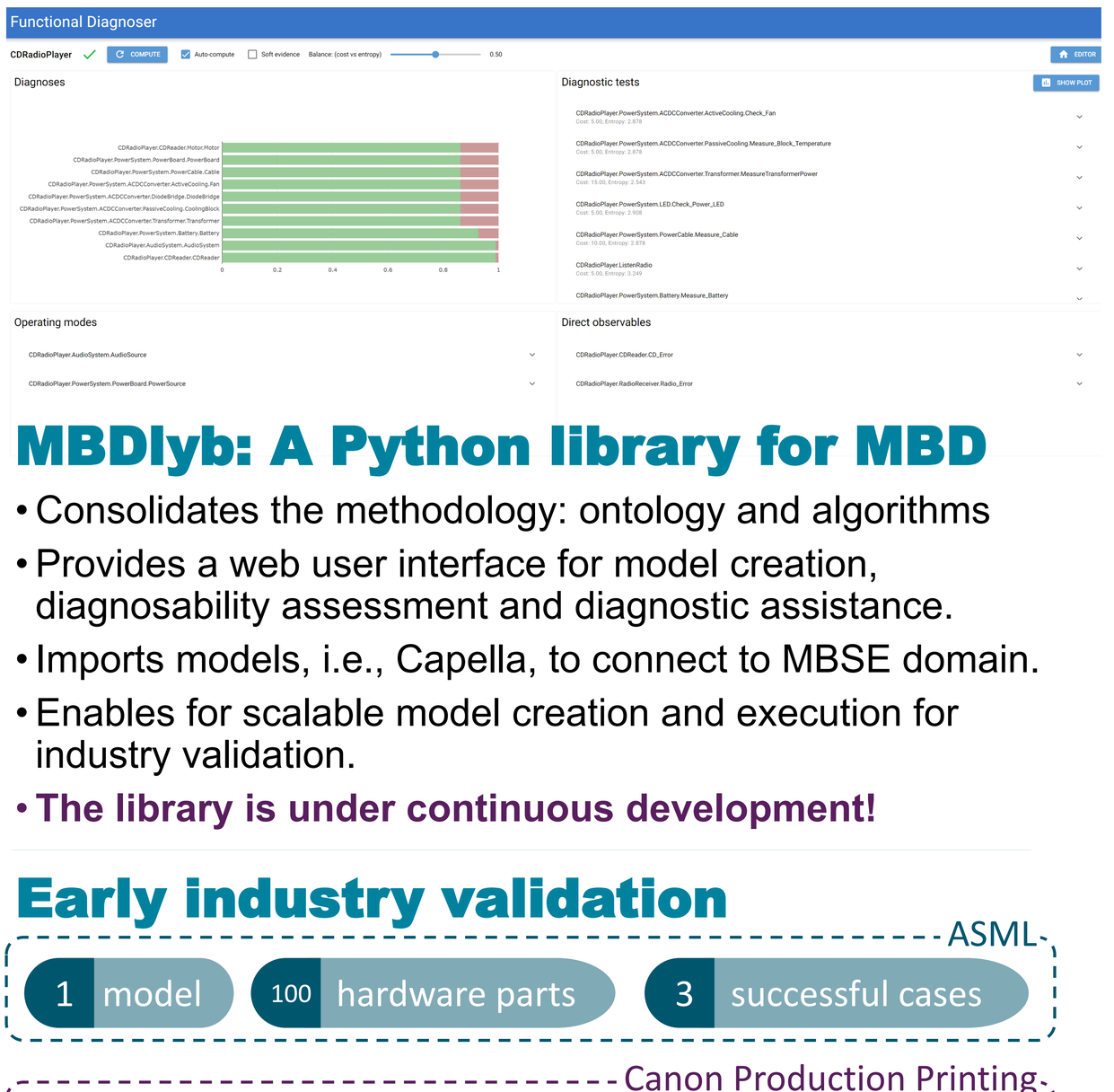
Methodology



Diagnostic scope

- Assists system designers to spot observability gaps early in the design.
- Assists service technicians in diagnosing a system after failure.
- Reason based on system design information.
- Field learnings can be added to the knowledge base to improve future diagnoses.





MBDIyb: A Python library for MBD

- Consolidates the methodology: ontology and algorithms
- Provides a web user interface for model creation, diagnosability assessment and diagnostic assistance.
- Imports models, i.e., Capella, to connect to MBSE domain.
- Enables for scalable model creation and execution for industry validation.
- **The library is under continuous development!**

Early industry validation

ASML

1 model | 100 hardware parts | 3 successful cases

Canon Production Printing

2 product models | 125 hardware parts and counting

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https://esi.nl/research/output/tools/mbdlyb

www.esi.nl

Partners:

ASML

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