The interaction of data quality monitoring and operational surveillance of weather radar networks

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THE MAIN QUESTION

What could be the enablers for an implementation and a continuous improvement of an interdisciplinary operational radar network monitoring ?

Our answer at LEONARDO:

- Flexible concept -> architecture
- Exchanging experience -> user group, taking customer on board (meetings, technology -> OS)
- Driving innovation -> OS, Cloud computing, AI, … Technology driven -> Community support -> Open Source „COSMOS: COmmercial Software Meets Open Source “

PLAN

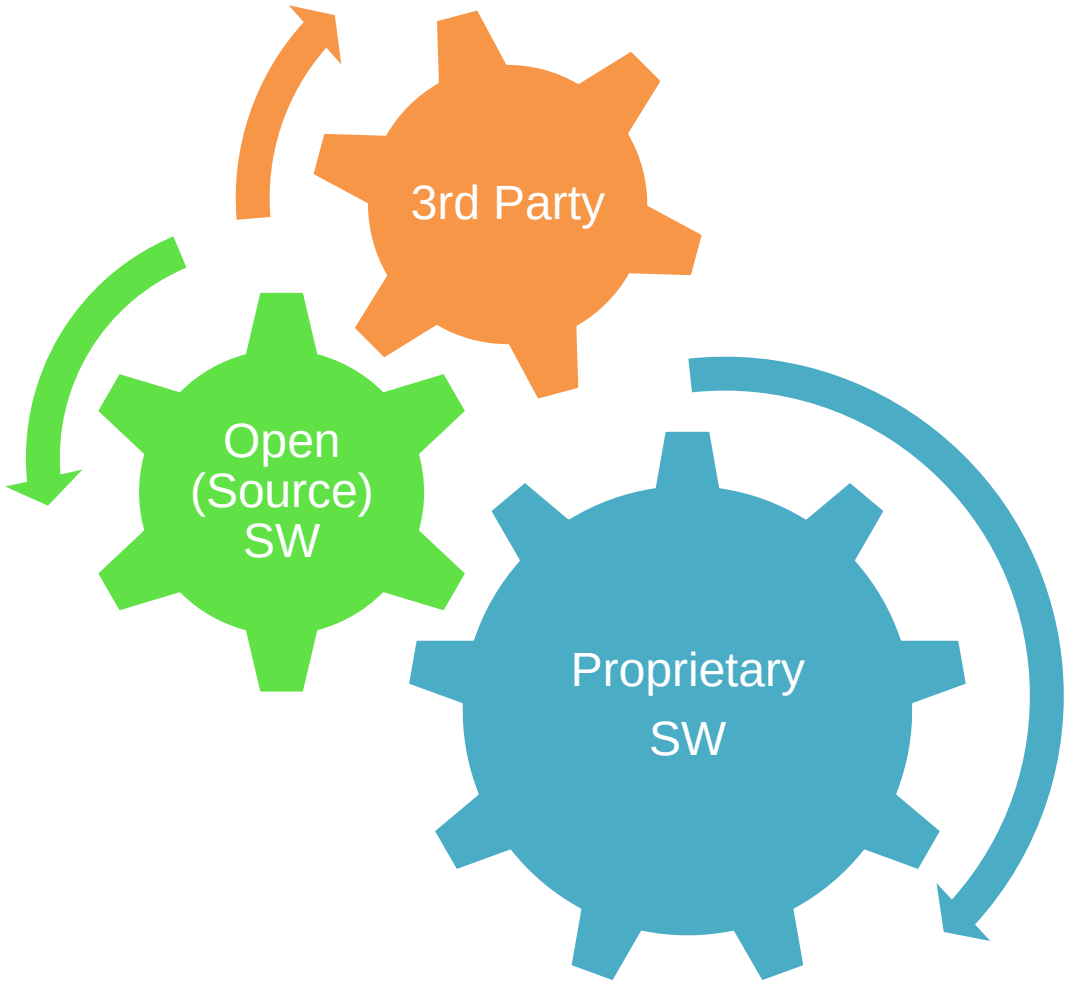
- 3rd Party (Open source) and commercial Software
- Monitoring concept
- Open questions

3RD PARTY (OPEN SOURCE) AND COMMERCIAL SOFTWARE

ARCHITECTURE : OPEN AND COMMERCIAL SOFTWARE

- How does co-existence of Open SW and commercial SW affect the SW development?

- How can Open SW be integrated into commercial SW?
  - ➢ Data processing and display
  - ➢ Relevant processing steps
  - ➢ Legal issues (exe vs. lib)

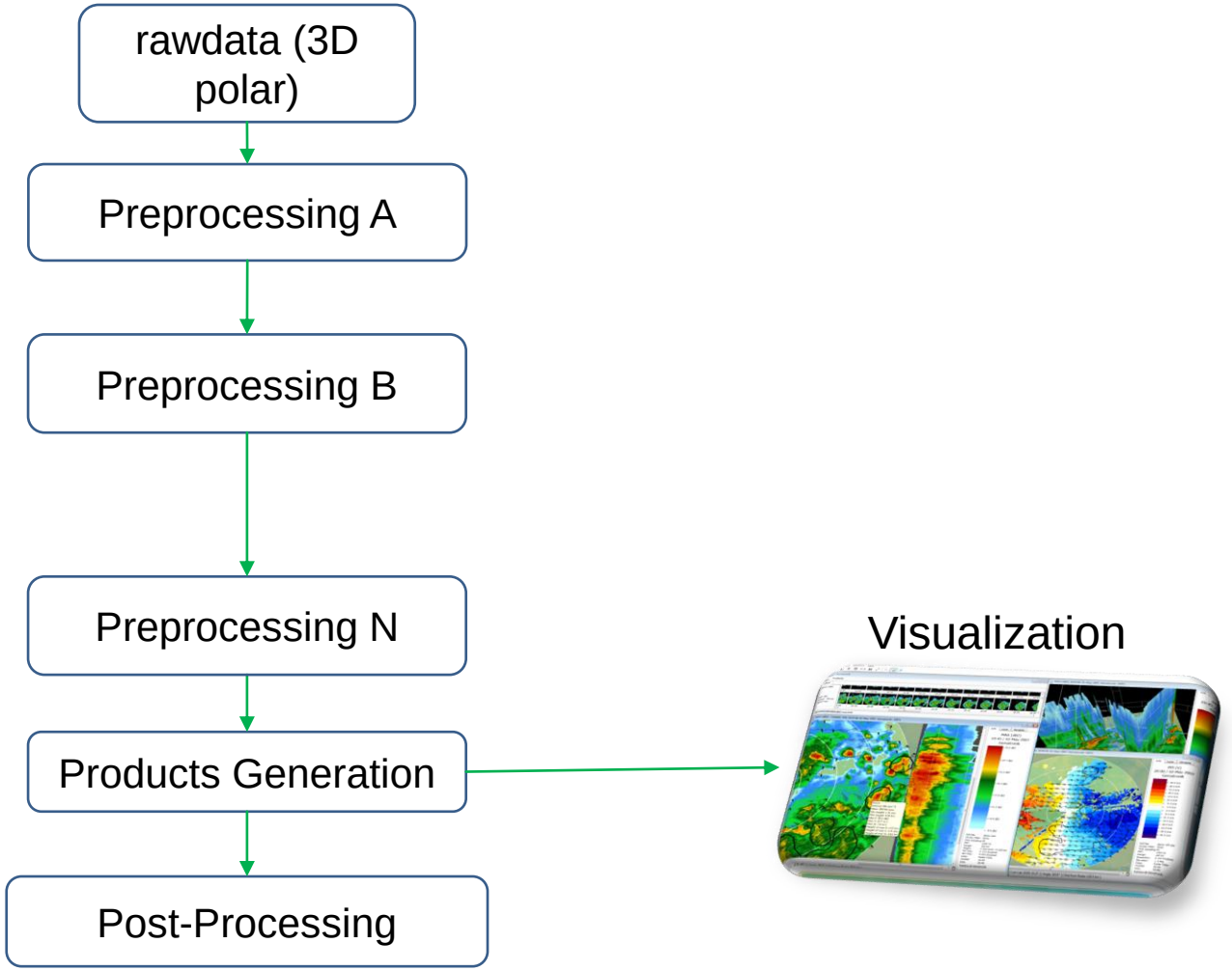


MAIN ADVANTAGES AND ISSUES

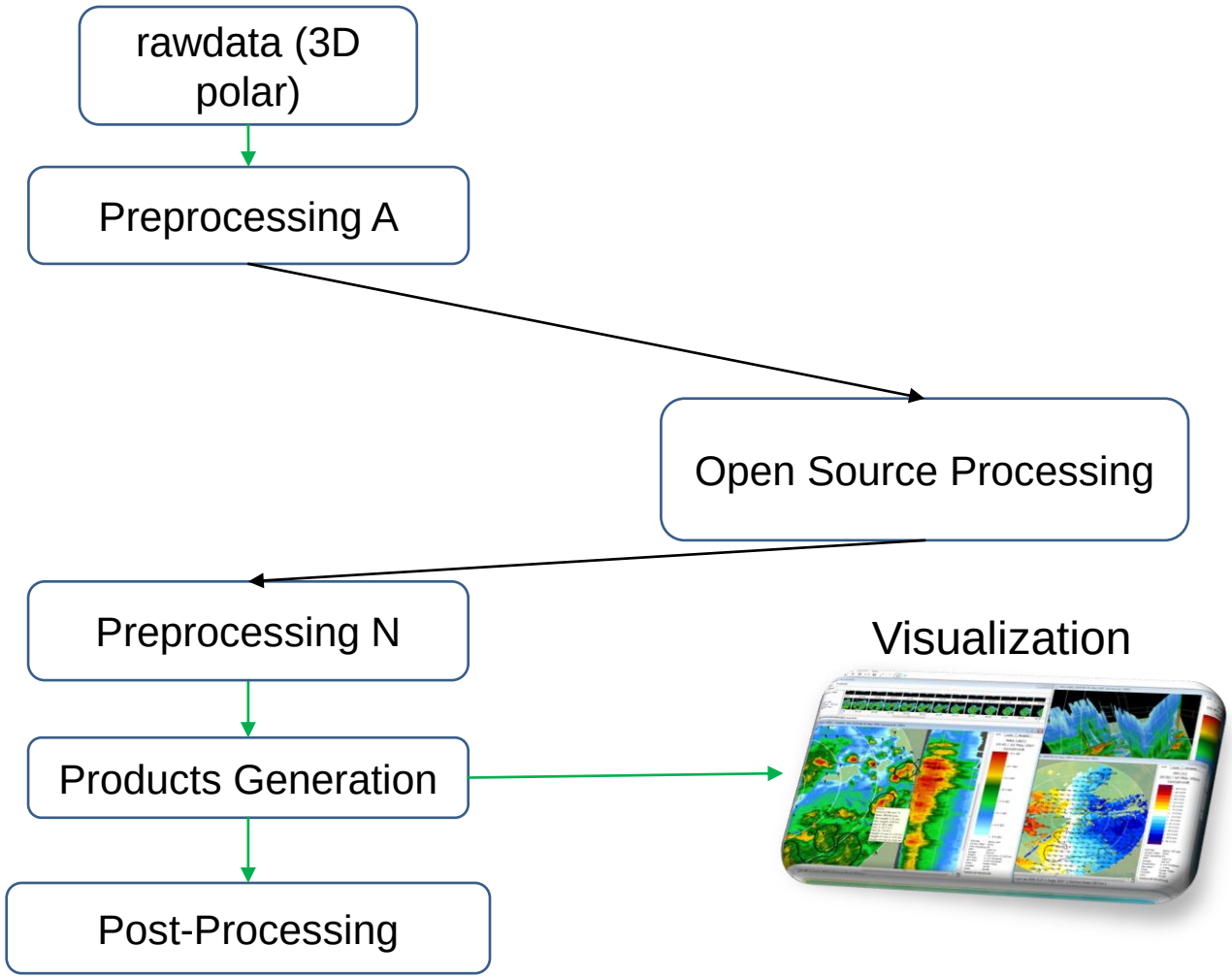
At LEONARDO we tested: BALTRAD, LROSE, PyART, WRADLIB

- **Advantages:**
  - Flexibility
  - Better for scientists
  - „To not reinvent the wheel“
- **Issues:**
  - Maintainability and availability
  - Quality performance
  - Training: Learn and understand
  - Bug tracking and fixing
  - OS and system environment
  - Data Conversion / Data Format (from / to) => **METADATA**

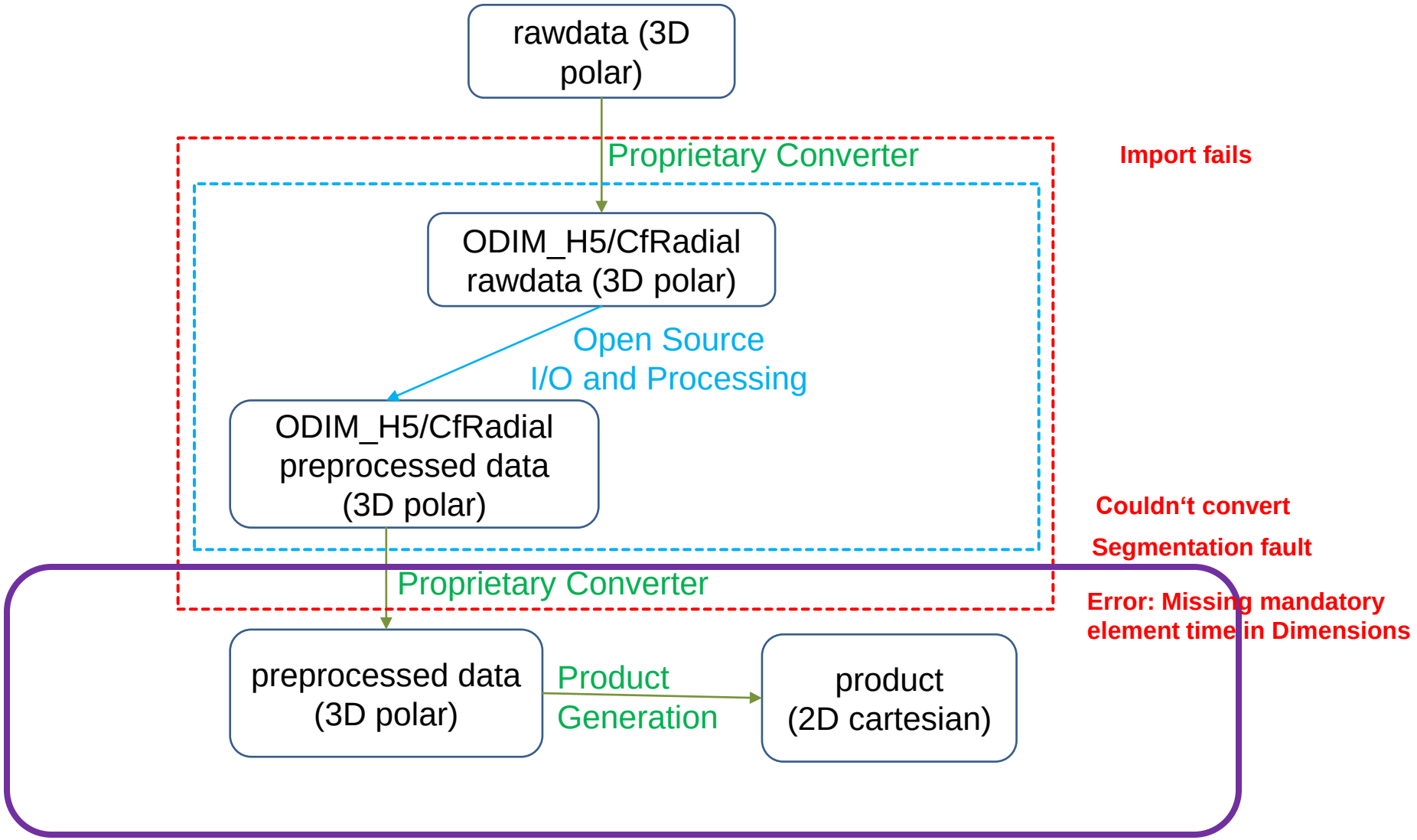
RAWDATA PROCESSING CHAIN



RAWDATA PROCESSING CHAIN: WITH OPEN SOURCE PROCESSING



OPEN SOURCE PREPROCESSING



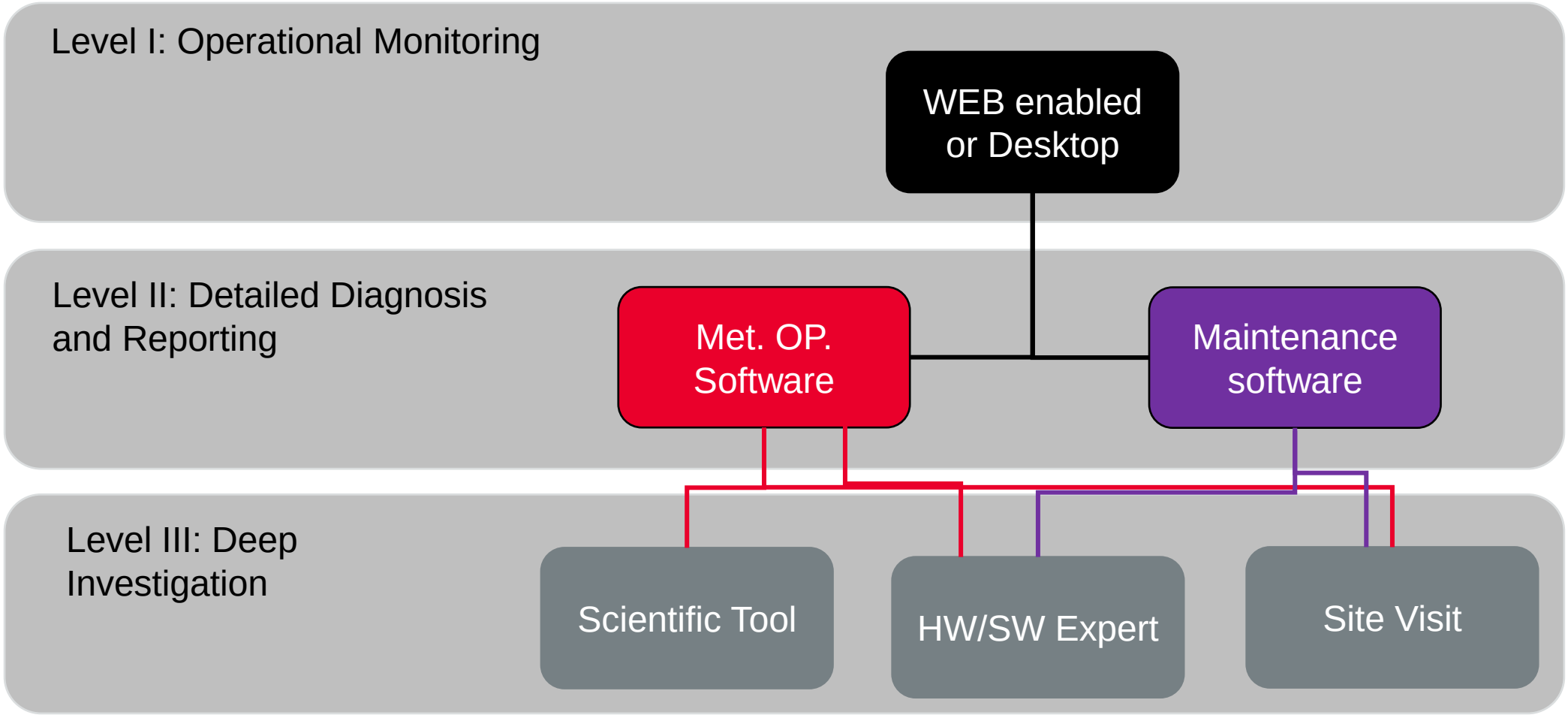
MONITORING CONCEPT

EXCHANGING EXPERIENCE: GOAL AND OBJECTIVE

Goal: Implementation of a general concept of 24/7 operational monitoring and surveillance of weather radar networks (and other sensors)

Objective: Include operational high level hardware and software status, and statistical data as function of time to show weather information and system status information to the operator

REAL TIME MONITORING AND SURVEILLANCE CONCEPT



POSSIBLE FEATURES : WHAT TO INCLUDE IN THE OP MONITORING

- Log messages
- High level sensor hardware status display (e.g. via a set of key parameters from the Radar sub-systems)
- Software processes status
- Historical status data (according to operational requirements)
- Key figures, user algorithms, open concept (ZDR in light rain, radar intercomparison, …)
- Manual input: Log book
- Manual radar status
- Statistical figures: data availability, RAM status, Hard disk size, connection, …
- **Radar Inter-comparison**

OPEN QUESTIONS

DRIVING INNOVATION: OPEN QUESTIONS

- What about long term studies (in term of Hardware parameters)?
- What about long term studies (in term of data parameters or key figures (Birdbath ZDR, …) which are related to Hardware)?
- What about centralizing the findings / case studies (Hardware issues) / experiences?
- Cloud computing ?
- AI / Machine learning ?

Thank you

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