UPTIME | FUTURE MAINTENANCE, NOW

UPTIME - UNIFIED PREDICTIVE MAINTENANCE SYSTEM - AND THE SEMANTIC WEB STANDARDS

Karl HRIBERNIK(BIBA) – Dimitris NTALAPERAS (UBITECH) – Yves KERARON (ISADEUS)

ABSTRACT

Traditional maintenance approaches are under-optimized. **20% savings on total maintenance costs and improvements of Overall Equipment Effectiveness (OEE) are achievable.** The UPTIME solution is built upon the predictive maintenance and four integrated technological pillars, Industrial Internet, IoT, Big Data and Proactive Computing.

Semantic Web standards are used for the interoperability of the components of the e-maintenance UPTIME platform and for its extensibility to various industrial domains.

VISION

UPTIME provides next-generation predictive maintenance aiming to optimize in-service efficiency, to self-improve over time and adapt to dynamic manufacturing environments. It proposes a novel predictive maintenance management model along with an associated information system.

Moreover, UPTIME follows a data-driven approach, which makes it applicable to every kind of equipment and industry regardless of their production processes and physical models.

UPTIME unifies operational intelligence and business analytics in the context of Industry 4.0 in order to provide visibility and insights into data and maintenance operations. This unification not only enables observing deviations in the manufacturing processes, but also predicting failures, deciding optimal maintenance plans and acting ahead of time, in a proactive way.
With UPTIME, manufacturing firms are able to harness different technologies, data sources (e.g. sensors, SCADA, PLC, asset management systems) and expert knowledge in order to drive maintenance operations through better decisions.
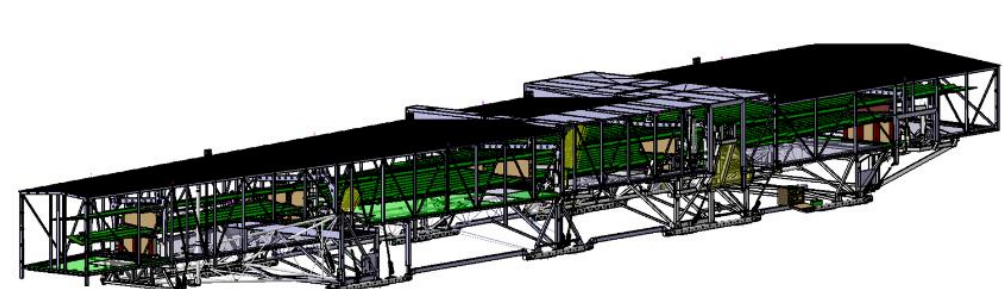
INDUSTRIAL ISSUES

Cold Rolling Mill Lines (Maillis)

White Goods Production Lines (Whirlpool)

Wing Upper Cover Transportation Jig (FFT)

M. J. MAILLIS GROUP

Whirlpool CORPORATION

FFT

Innovative technologies such as **Internet of Things** (IoT) or **Analytics Capabilities** offer opportunities to monitor and predict the condition of assets
However, manufacturers are faced with barriers to reach these opportunities
✓ Difficulties of deployment
✓ Lack of standardization
✓ Lack of suitable competencies

Current predictive maintenance solutions only offer analytics capabilities to **predict failures** and **estimate the remaining lifetime of assets**. Operators have to use their own **experience** to:
✓ Make decisions of **what** maintenance **actions** to implement
✓ Balance between multiple variables to decide **when** to implement them in the **planning**

CONCLUSION

Solutions based on semantic Web Standards are serious alternatives to traditional solutions with low interoperability and high costs of obsolescence.
The UPTIME project is an opportunity **to demonstrate for concrete industrial use cases, the benefits of web based standards for the Maintenance of the Future.**

UPTIME & SEMANTIC WEB STANDARDS

Semantic Web technologies are currently in a transition phase from research to industry where they raise growing interest. UPTIME e-maintenance platform, is composed of interacting components and aim at a seamless plugin with diverse industrial information environments. As such, it needs a standardization approach from the data acquisition, linking to querying for decision.
Semantics and ontologies have been identified as means to tame the issues linked to the diversity of the components of the UPTIME e-maintenance platform and its deployment in various industries.
W3C standards are considered for:

- **Data exchange** using MIMOSA OSA CBM (Open System Architecture Condition Based Maintenance) XML schemas to support the implementation of ISO 13584 - Condition Based Maintenance and Diagnosis,
- **Data Linking and cleansing** to bring together data from various sources and create value, to improve their quality and to flexibly integrate new datasets
- **Ontology based Modeling** to represent knowledge and exploit it.
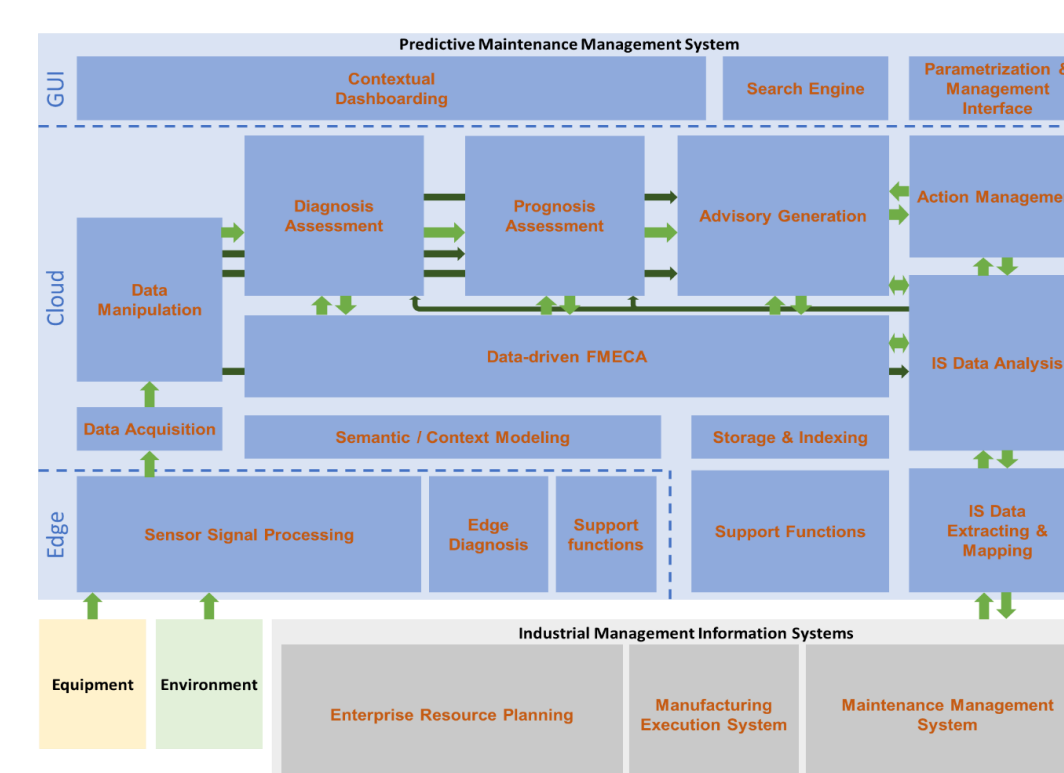
Generic groups of functions of the UPTIME solution
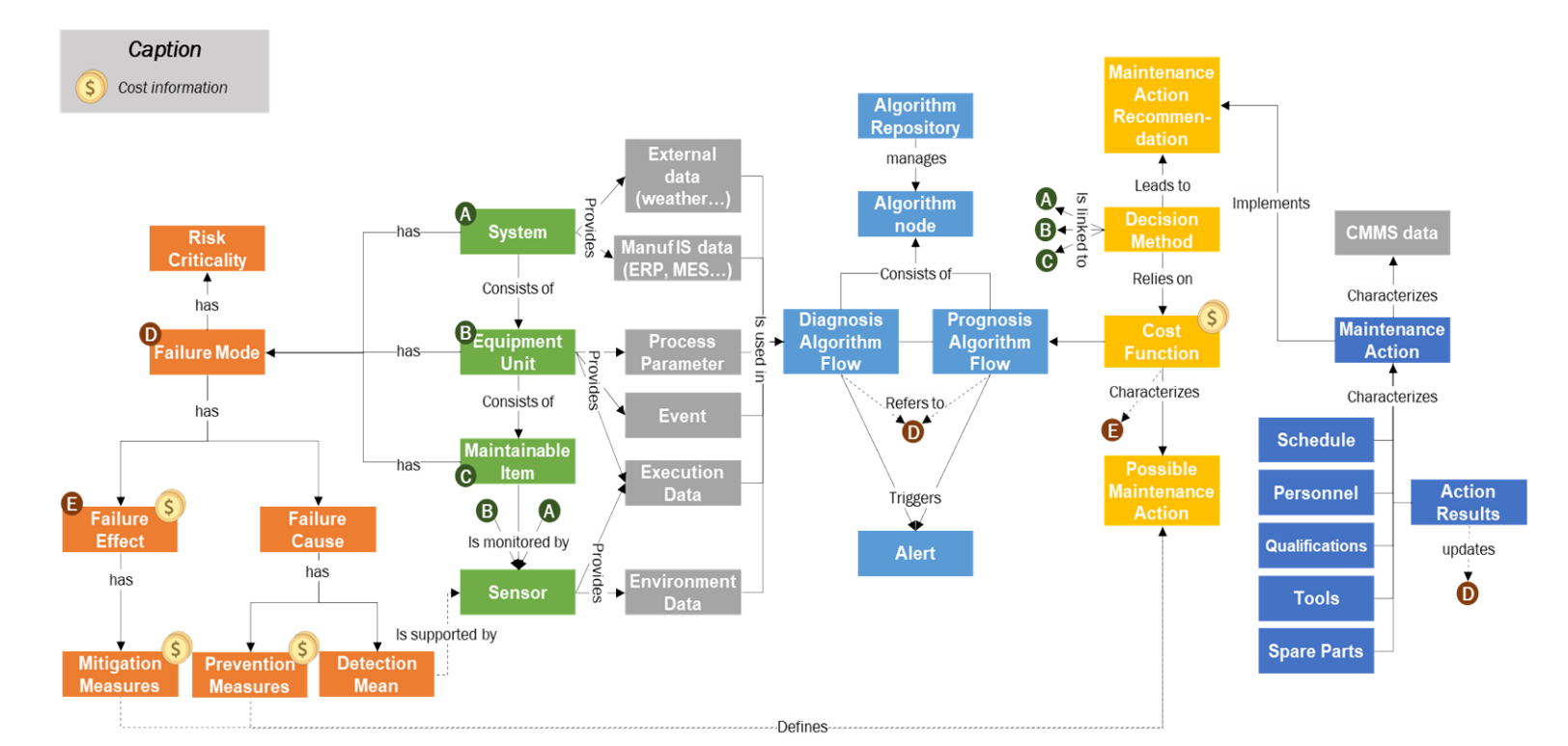
High Level Business Data Model

UPTIME APPROACH

UPTIME enables manufacturing companies to fully exploit real-time and historical data. It takes assisted decision-making to the next level by presenting maintenance scenarios with the optimal maintenance actions to implement at the optimal time. The operators are then able to mitigate risks, minimize maintenance costs and improve OEE.

BENEFITS
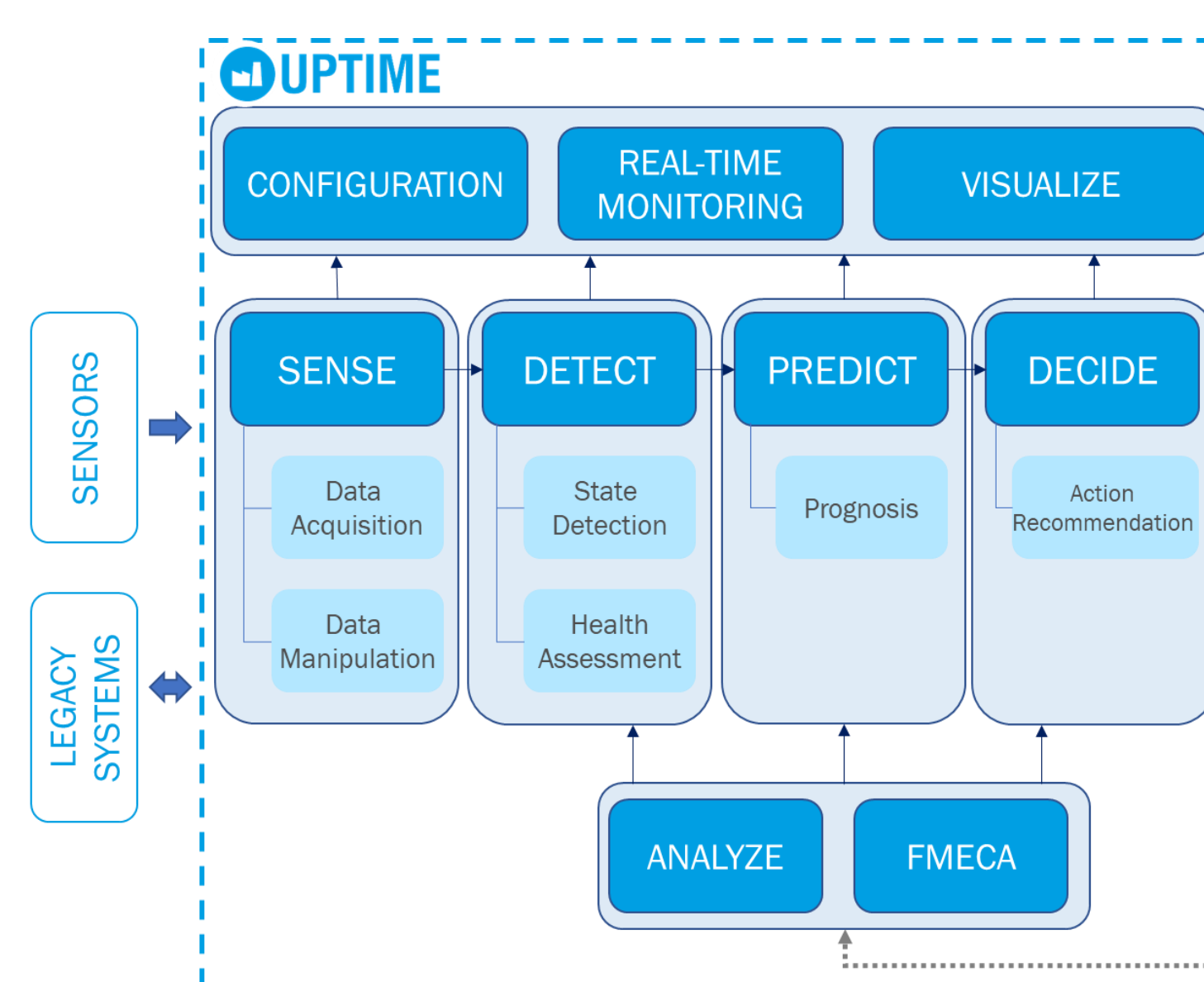
✓ A powerful decision-making tool to minimize overall costs
✓ Optimal maintenance actions to mitigate failure risks
✓ Optimal implementation time to optimize production schedule
✓ Maintenance scenario simulation to explore alternatives
✓ Sensor-enabled feedback to constantly improve recommendations

UPTIME PARTNER PROGRAM

It provides information, use cases analyses and assistance with the implementation of the UPTIME solution with proven benefits based on real industrial use cases. **Software technology is provided free of charge.**

Join the UPTIME community! community@uptime-h2020.eu

Further information on the UPTIME Partner Program on our website: **www.uptime-h2020.eu**