Z-BRE4K

Project Presentation

Nicola Raule - CRIT

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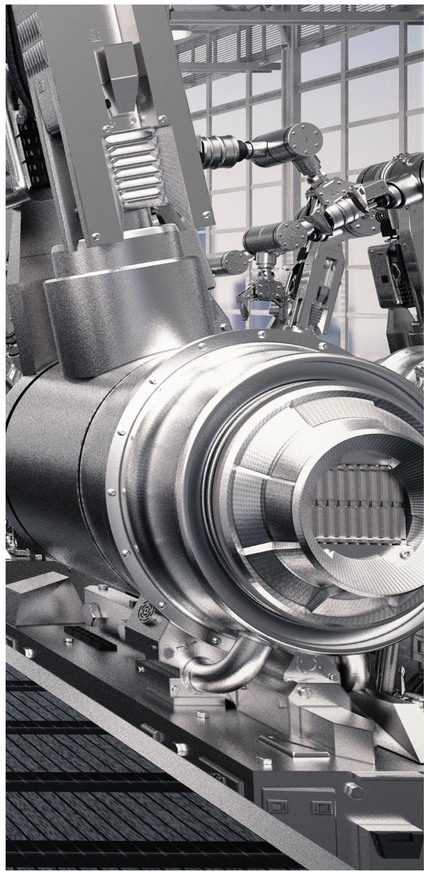
CRIT’s shareholder Companies

Z-BRE4K



Strategies and Predictive Maintenance models wrapped around physical systems for Zero-unexpected-Breakdowns and increased operating life of Factories

Project Objectives

- Minimizing (zero!) unexpected breakdowns
- Maximizing operating life of production systems

Z-BRE4K
Project Partners

Innovation Action (IA), TRL 5-7, 17 partners from 9 countries, 42-month project, 6 M€ EU-contribution for total expected cost of 7.2 M€

Three Use case Demos

The Z-BRE4K solution will be demonstrated in three industry-relevant scenarios, considering process, machine and shopfloor levels.

SACMI - CDS

Plastic compression moulding machinery

PHILIPS

Cutting and bending line for shaving blades manufacturing

GESTAMP

Metal sheet stamping and welding for automotive applications

Project Features

1

Interoperability

Design & development of Z-BRE4K platform on both open components (FIWARE, Open Fog) and reference architectures (IIC, RAMI4.0, **Industrial Data Spaces**)

2

HW & SW integration

Development of facilities (H/W & S/W) to continuously monitor condition and performance of production assets, by means of a set of IDS connectors and containers

3

Machine Learning

Construction of networked machine simulators shadowing operations of machines in a ‘digital-twin’ paradigm

- offline module tied to physical model
- online module fitted real-time with data reflecting machine state

4

PdM functionalities

Based on available data, Machine Learning algorithms will enhance failure prescription and Remaining Useful Life of components/systems.

5

FMECA module

Design & development of risk-mitigation facilities through Failure Mode, Effects and Criticalities Analysis (FMECA)

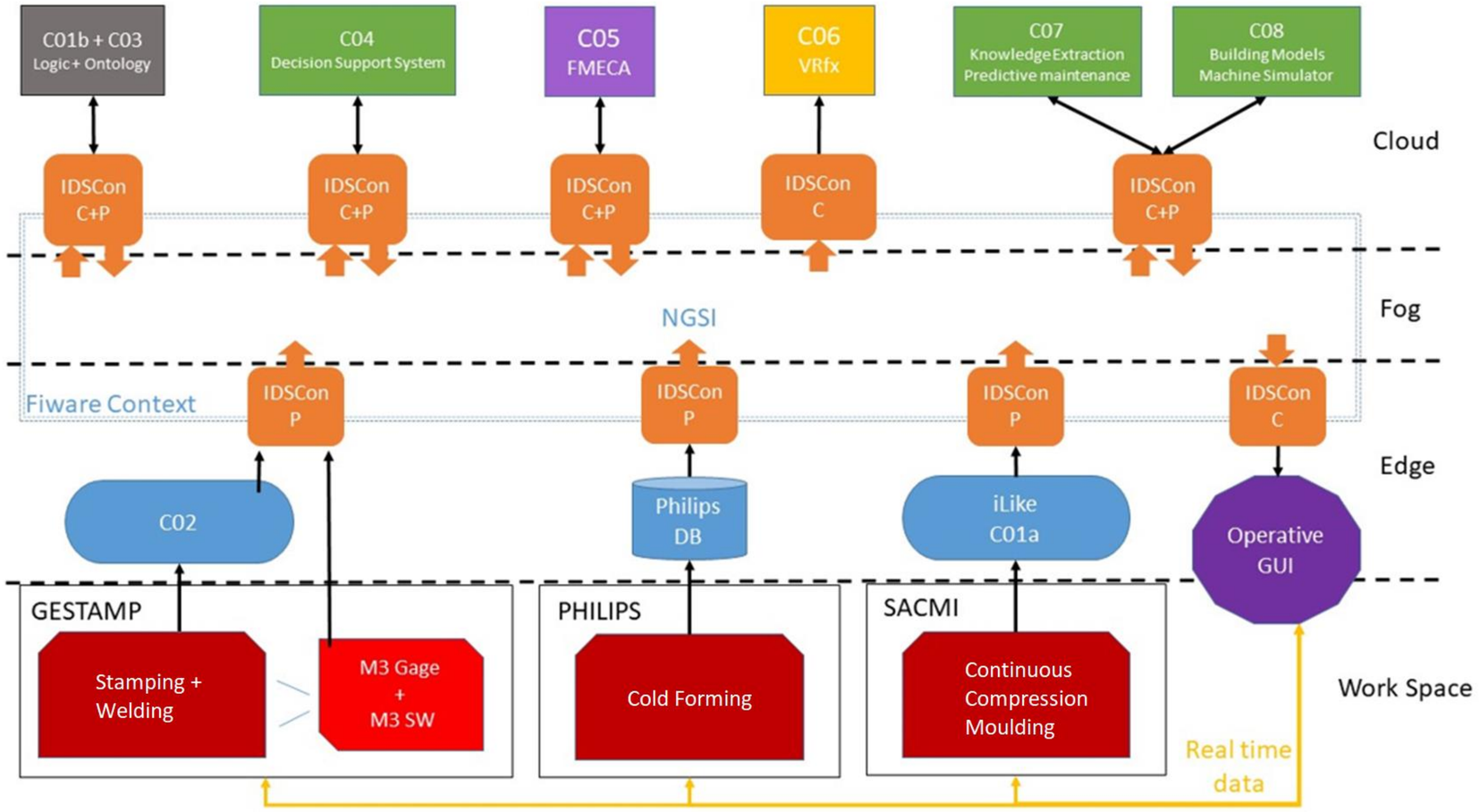
6

Enhanced DSS

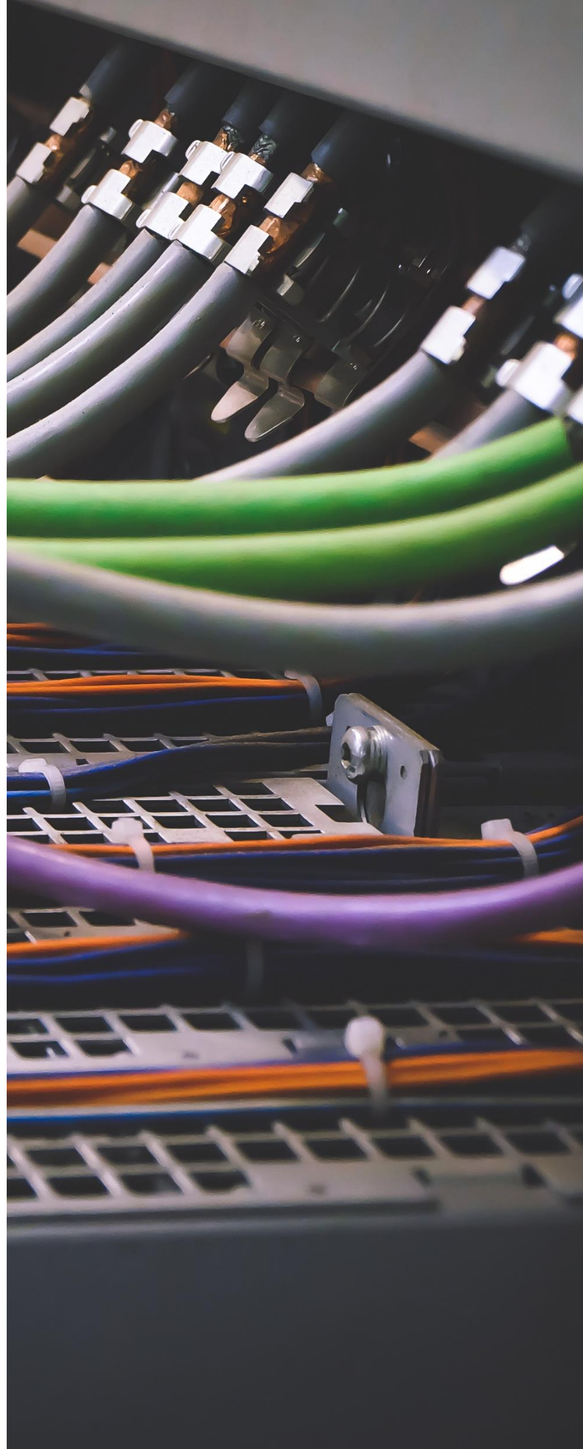
Design and development of Z-BRE4K’s Decision Support System (DSS)

Z-BRE4K

Z-BRE4K General Architecture Component Distribution



Incorporation of the IDS connectors into the global Z-Bre4k architechture



Z-Strategies

Z-PREDICT: to deploy an intelligent behavior-based monitoring and analysis system, capable of predicting the components/subsystems upcoming state and needed maintenance operations with high level of confidence.

Z-PREVENT: to prevent the occurrence, building up and propagation of failures through responsible factors identification and flagging by means of Failure Model and Effect Analysis (FMEA).

Z-DIAGNOSE: to execute a diagnosis when an occurring or an emerging failure is detected and clustering of false positives and false negatives.

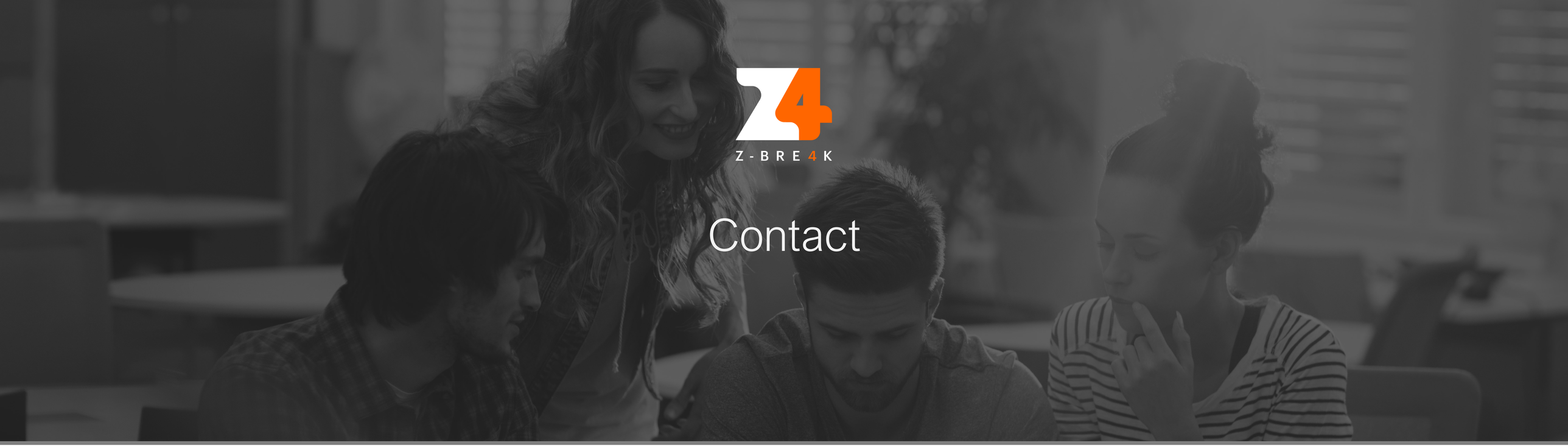
Z-ESTIMATE: to evaluate the remaining useful life of the assets based on the information deriving from strategies and operations.

Z-MANAGE: to supervise and optimize the system by interfacing with the Decision Support System (DSS), Manufacturing Execution System (MES) and filtered operational data.

Z-REMEDIATE: to make optimized decisions over maintenance actions in case of failure.

Z-SYNCHRONISE: to identify the required type of action for a diagnosed failure and to synchronize all the remedy measures with supply-chain tiers, production planning and logistics.

Z-SAFETY: to prevent any activation to the machines under investigation or repair and securing the comfort of human personnel on the shopfloor.



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