Use Case 2

Automotive

TENNECO

Jessica Gil

European Commission | Horizon 2020 European Union funding for Research & Innovation

CREMA has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 637066

Presentation

INTRODUCTION: Automotive

- Context
- Problems
- Solutions

CREMA: USE CASE II

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Automotive: Solution

Context	Problems	Solutions
• Large amount of processes	Unexpected downtimes	Anticipate to the machine errors defining main KPI's and Alarms
• Different lines	Data not gathered	Industreweb data collection
• Variety of products	High quantities of manuals, data, work instructions difficulties to find information	Support ticketing system
• Multiple tooling	Wrong assets. Difficulties to locate assets.	Ubisense sensors and Smart Factory
• Plants located around the world	Overall Equipment Effectiveness OEE<1 Quality<1	ODERU Optimization

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CREMA: USE CASE II

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Tenneco Pilot Area

- Use Case II simulates the welding of an Exhaust.
- Welding and Test cells present in Tenneco have been modelled in Pilot Area at the Waterton Technology Centre
- Realistic implementation scenario to test key production themes

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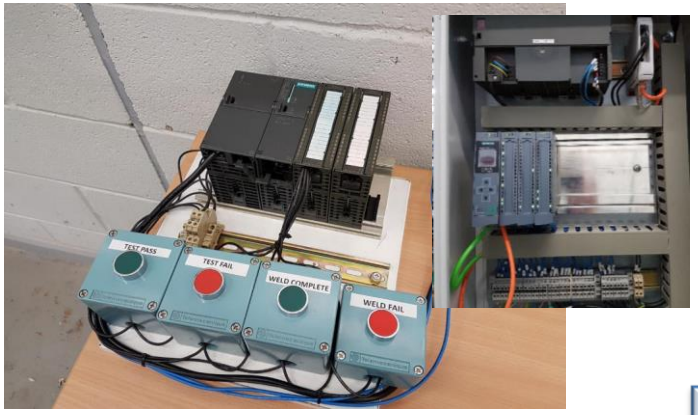
Pilot Area

ABB Robot + IW Data collector

Test cell + Siemens S7 PLC



Tool + Components

SmartFactory Sensor and tags

Current Convertor and Toroidal Hardware Implemented to Capture Welding Current

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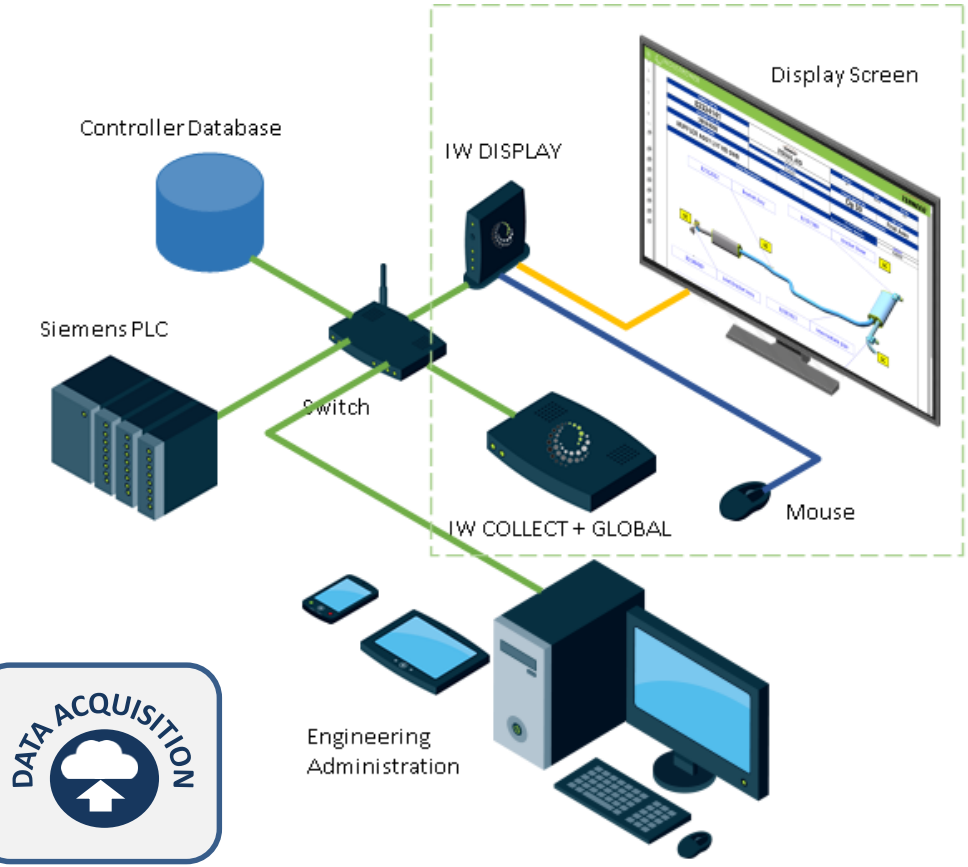
Data Collection



- Data Collection framework
  - Machine
  - Documentation
- Server to collect and manage data, and security
- Thin client to handle local interaction with operators and visualisation

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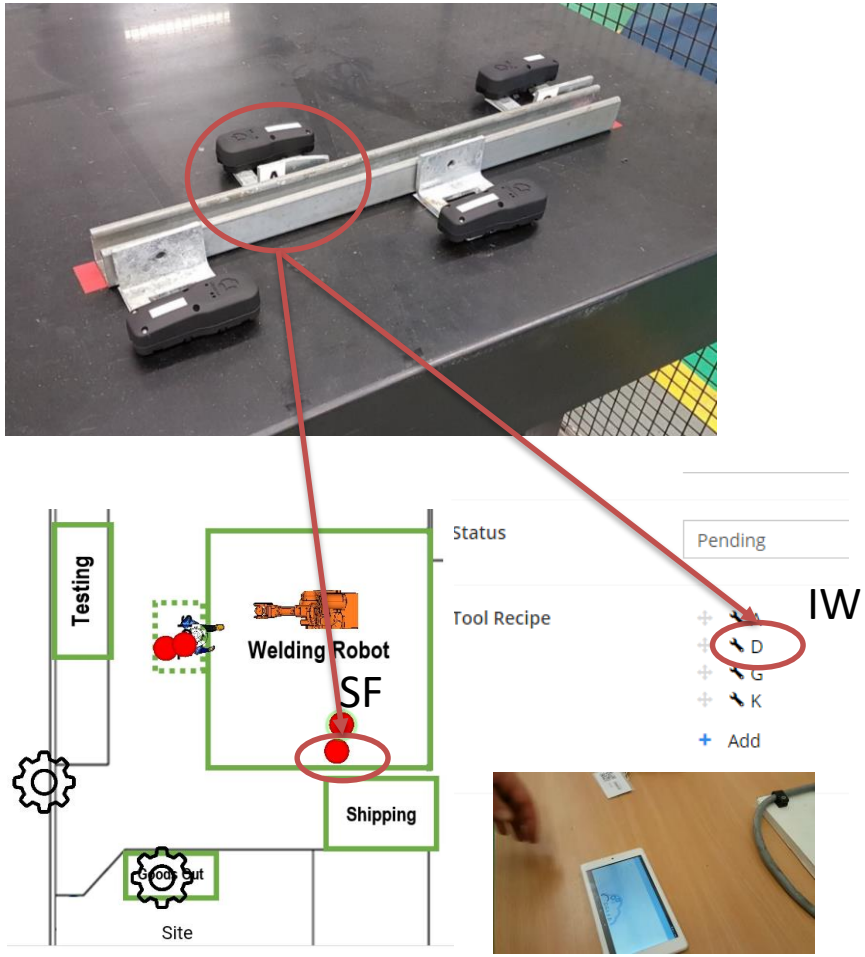
Tool Tracking

- Smart Factory sensors and tags
- Tool recipe is retrieved from IW
- Actual tools present in Robot welding zone retrieved
- Comparison made between both arrays to determine status
  - CORRECT
  - INCORRECT
  - NOT PRESENT
- Allocate tool with SF and IW



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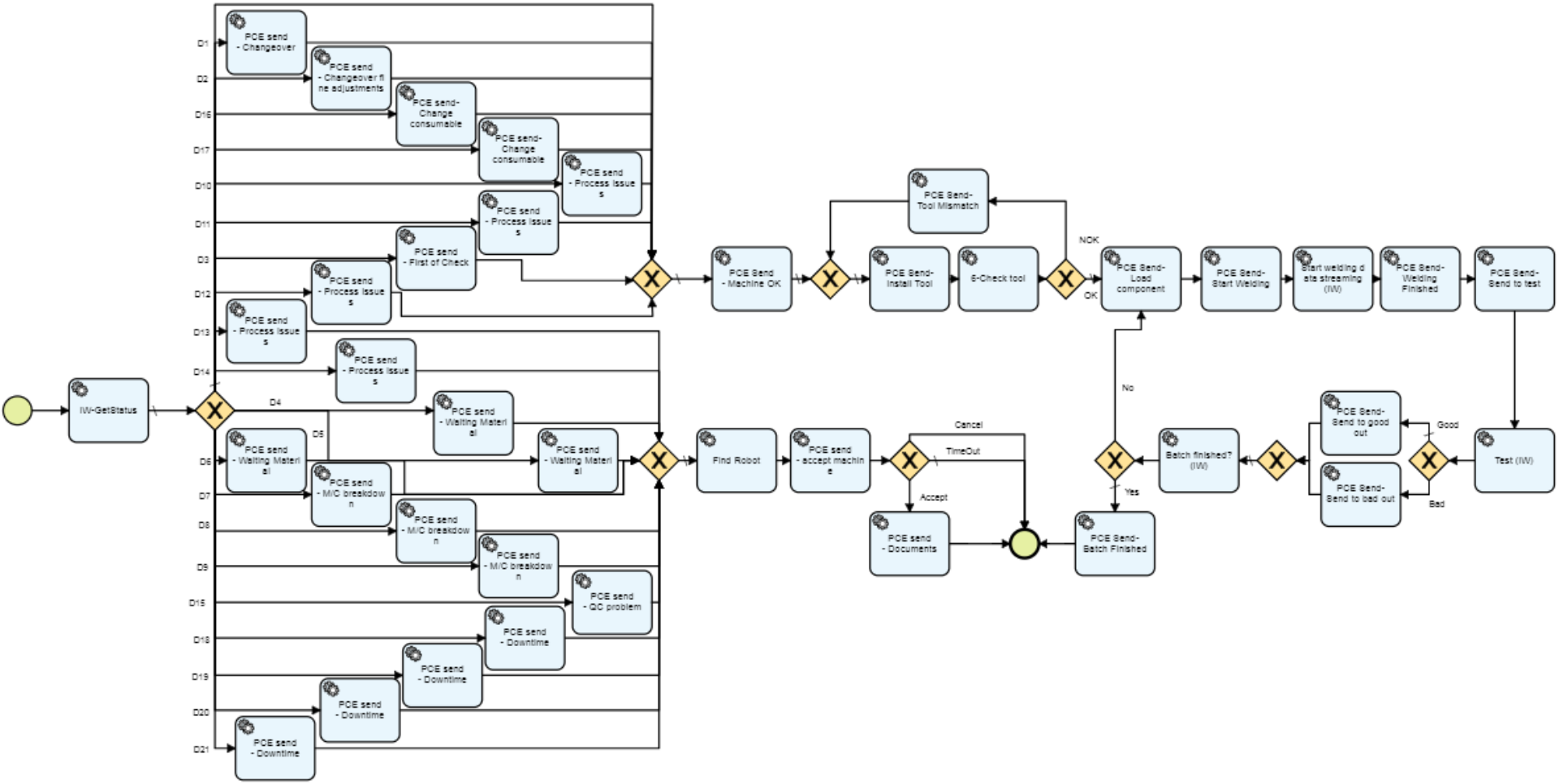
Process Model UC2



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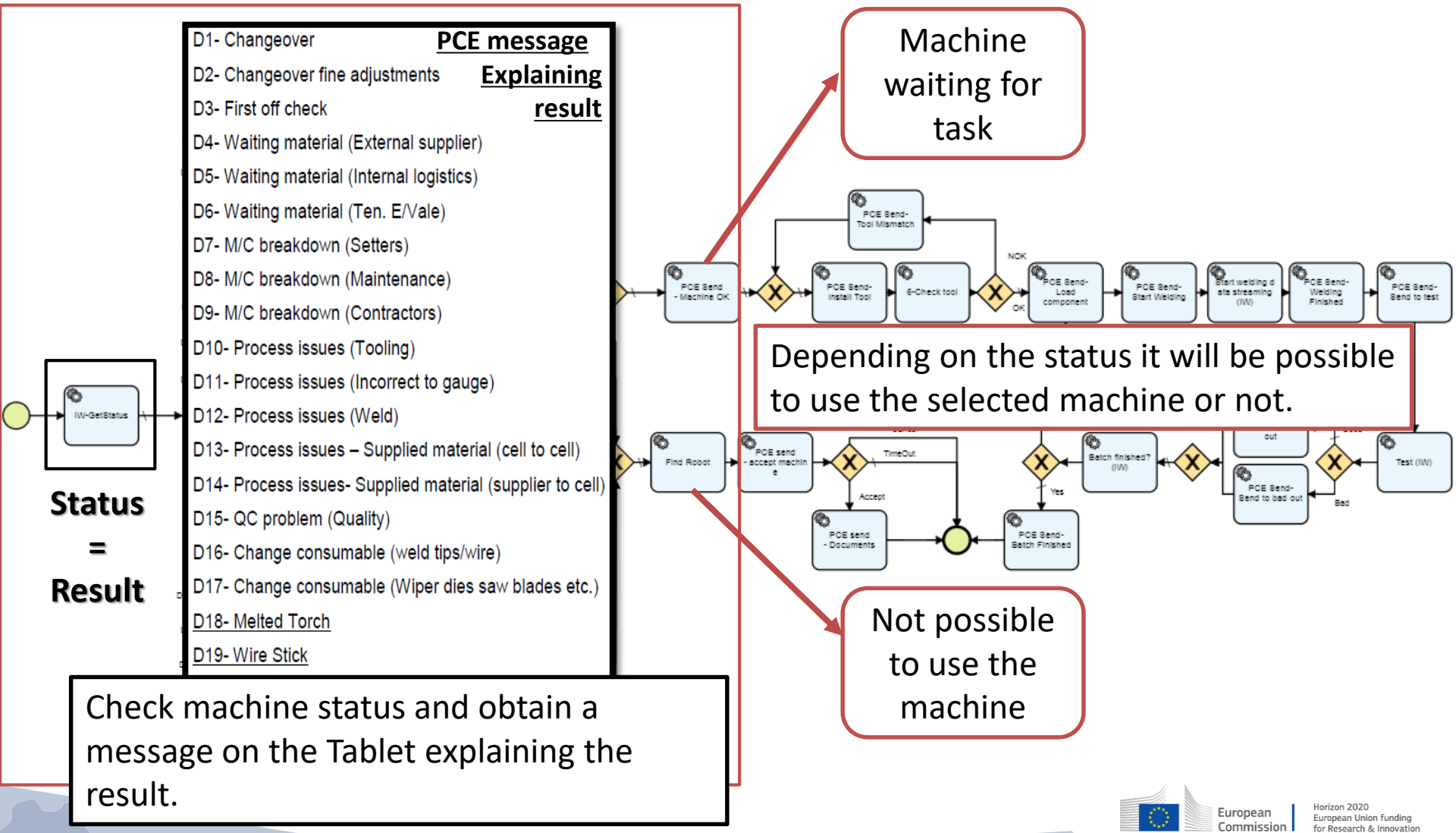

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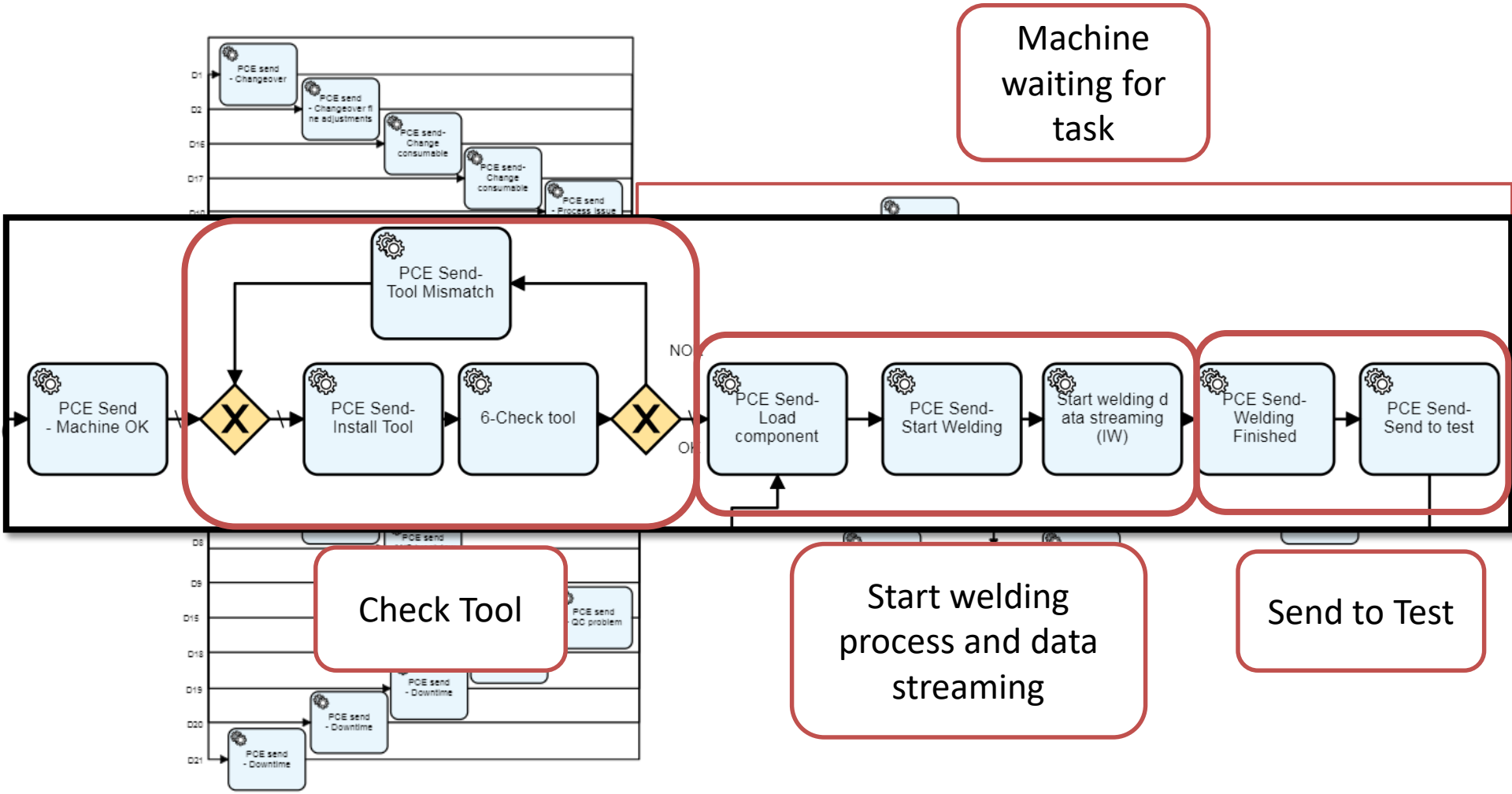

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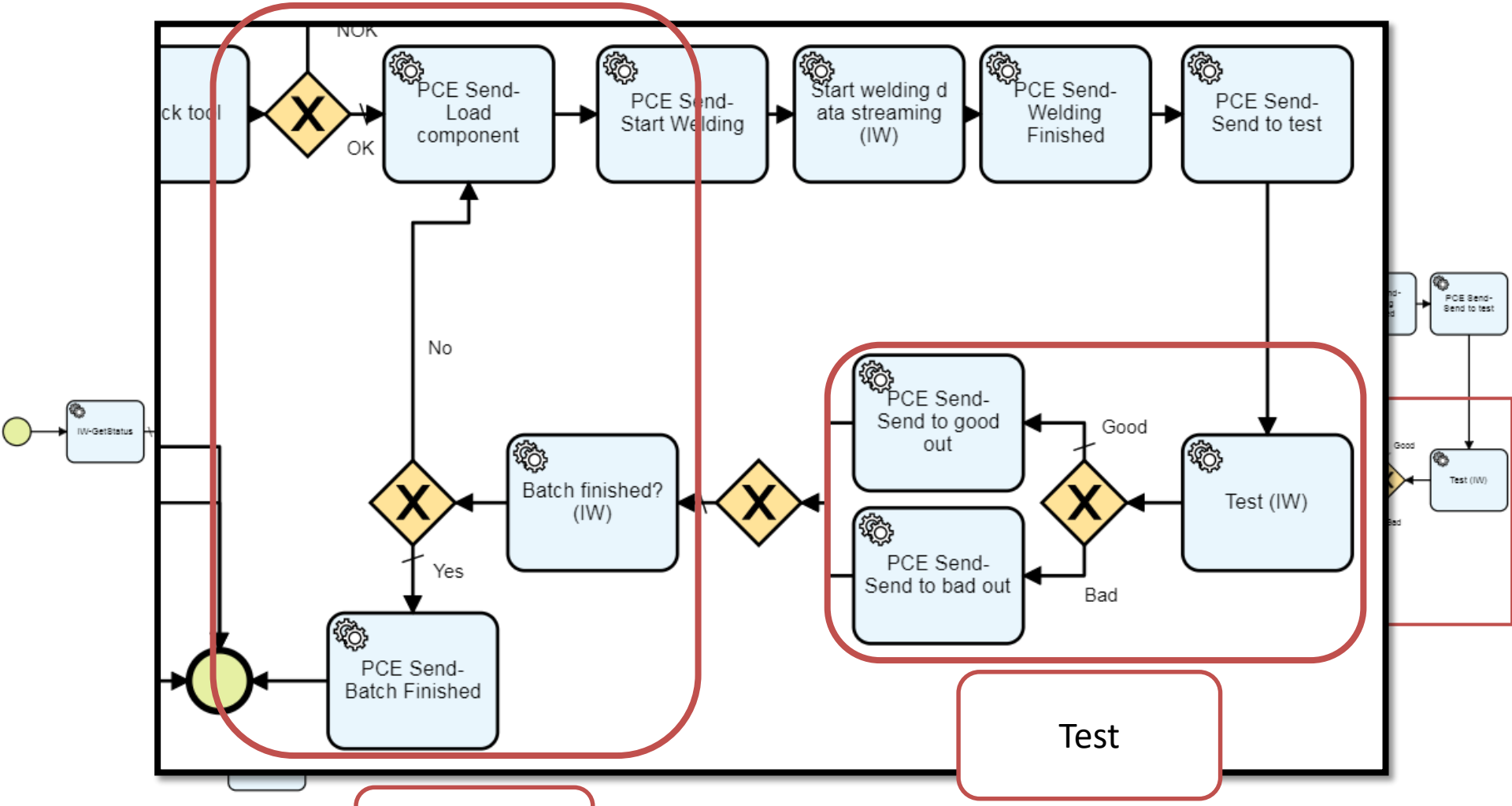

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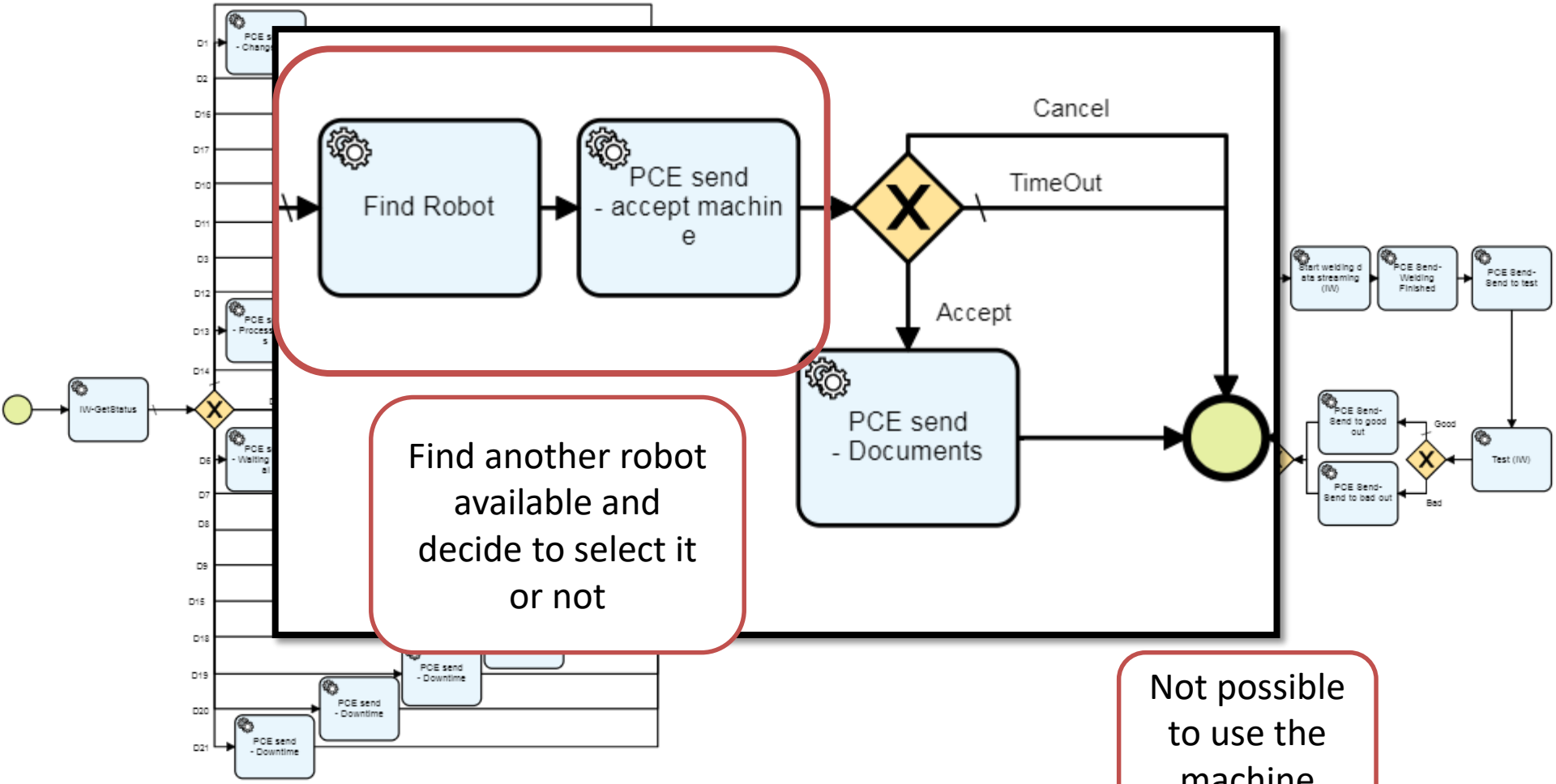

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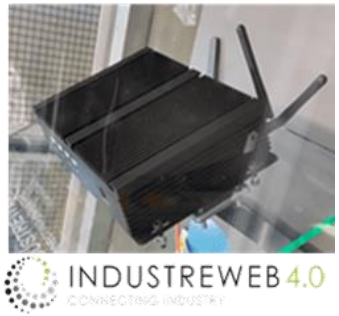
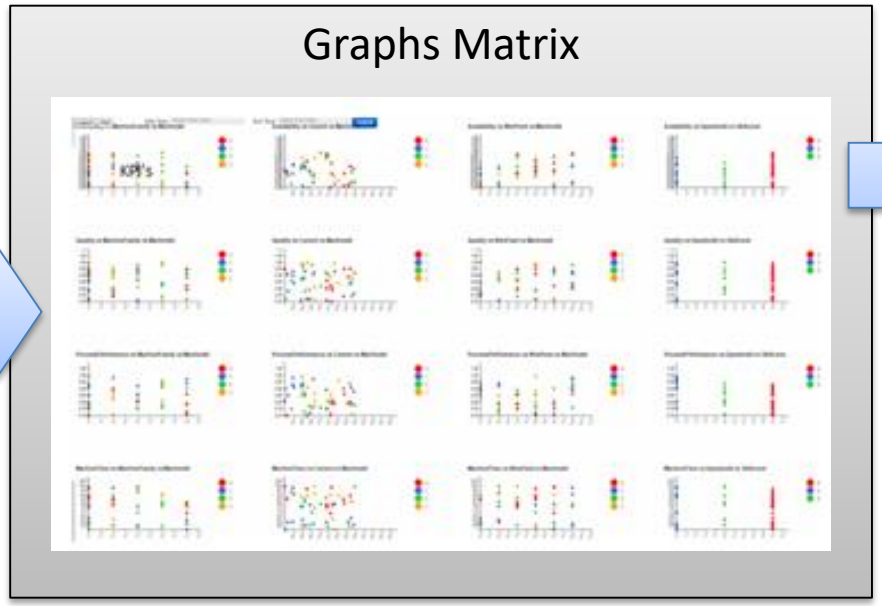
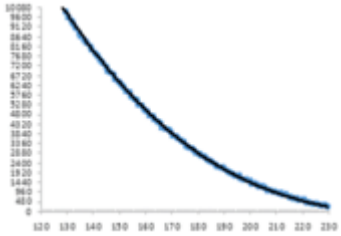
Data Analytics



Data Structure
- Asset Attributes
- KPI's





Get Formulas

Modify COP

Optimise

- Collect and monitor assets data (KPI's vs. asset attributes)
- Get formulas for the optimisation
- Optimise parameters to get best outputs

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Monitoring and Alarming

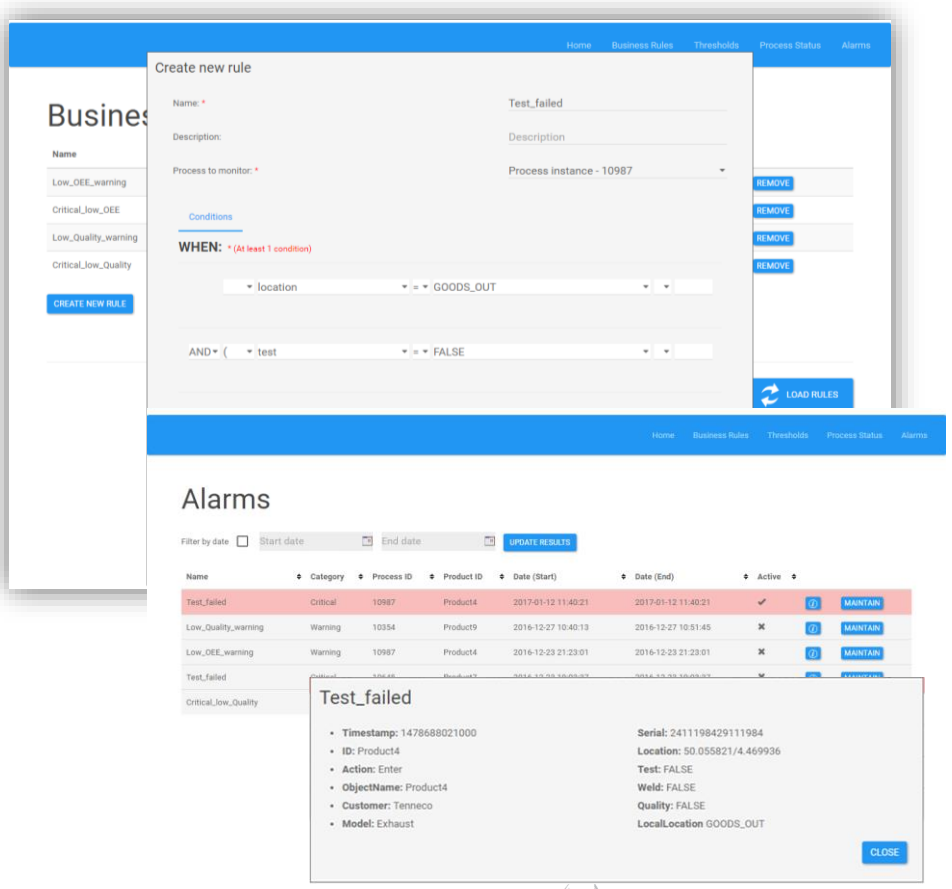
- Low_OEE (Overal Equipment Efectiveness)
  - Low_OEE_warning

    OEE result between low and critical threshold
  - Critical_low_OEE

    OEE lower than critical threshold
- Quality
  - Low_Quality_warning

    Quality result between low and critical threshold
  - Critical_low_Quality

    Quality lower than critical threshold
- Machine Stoppage
- Machine starved
- Test failed



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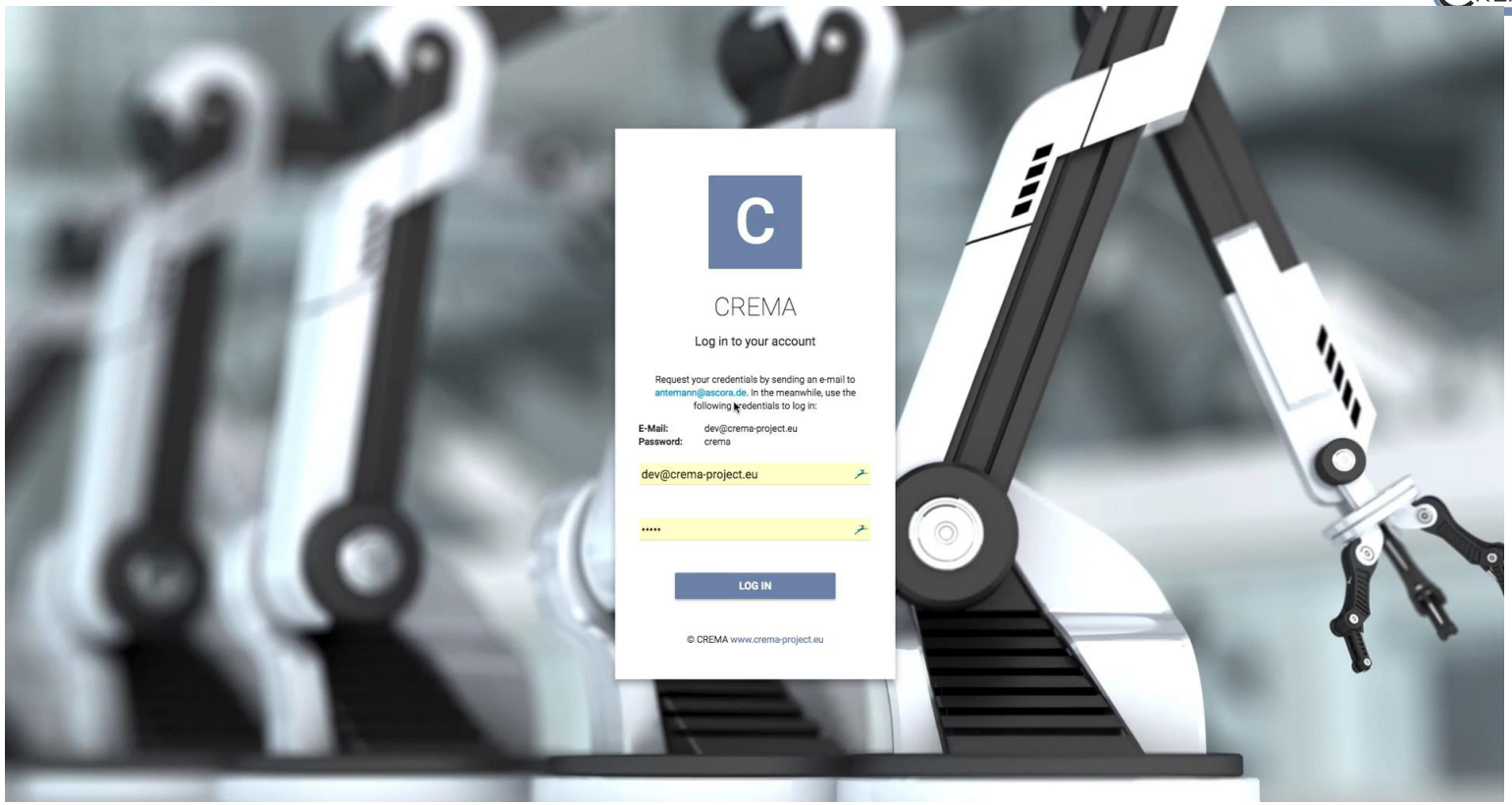
Tikki System



- Operator receives messages about machine problems occurred when he/she was not working with that machine and the instructions followed to solve them

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