Bringing Research to Market

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Impact of EU research

The benefits for Control 2K
being involved in Research Projects

On the road towards Industry 4.0 and digital transformation

We have been involved in several EU research projects that have made a real difference to us.

- FLEXINET – rapid re-configuration of manufacturing production systems – supply chains

- ADVENTURE – manufacturing orchestration in the cloud

- FITMAN – open sustainable ecosystem for Smart Applications (FiWare)

- CREMA – elastic manufacturing and CPS

- DIGICOR – will give us tools and ideas on how to create and operate collaborative networks across value chains

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Bringing research to reality

- Companies, and especially SMEs, are always more interested in what products can do for them rather than the technologies that drive those products

- We have always strengthened the message with our research partners in EU projects that research should be driven by the end user needs

- We must make research results understood by the market rather than leave them locked in the research world

- We showcase and demonstrate products and services that can help manufacturing companies improve their businesses and processes with digital technologies

- We strengthen and improve our own products (Industreweb 4.0 & Flexeweb) through participation

- EU Commission drive to exploitable outcomes not research outcomes

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DIGICOR

- Collaborative Manufacturing
  - Digital twin of manufacturing processes
  - Toolstore – offering tools from CREMA, FiWare and any other interoperable platform using
  - DIGICOR platform has the same approach as SMECluster
  - Industreweb as Factory Connector – OPC UA + ISA 95 Semantics

CREMA

- Cloud Platform Providing
    - "Elastic Manufacturing" Service Leasing / Releasing
    - CPS
    - Big Data Analytics
    - Process Design and Optimisation
    - Shopfloor data linked to via Industreweb
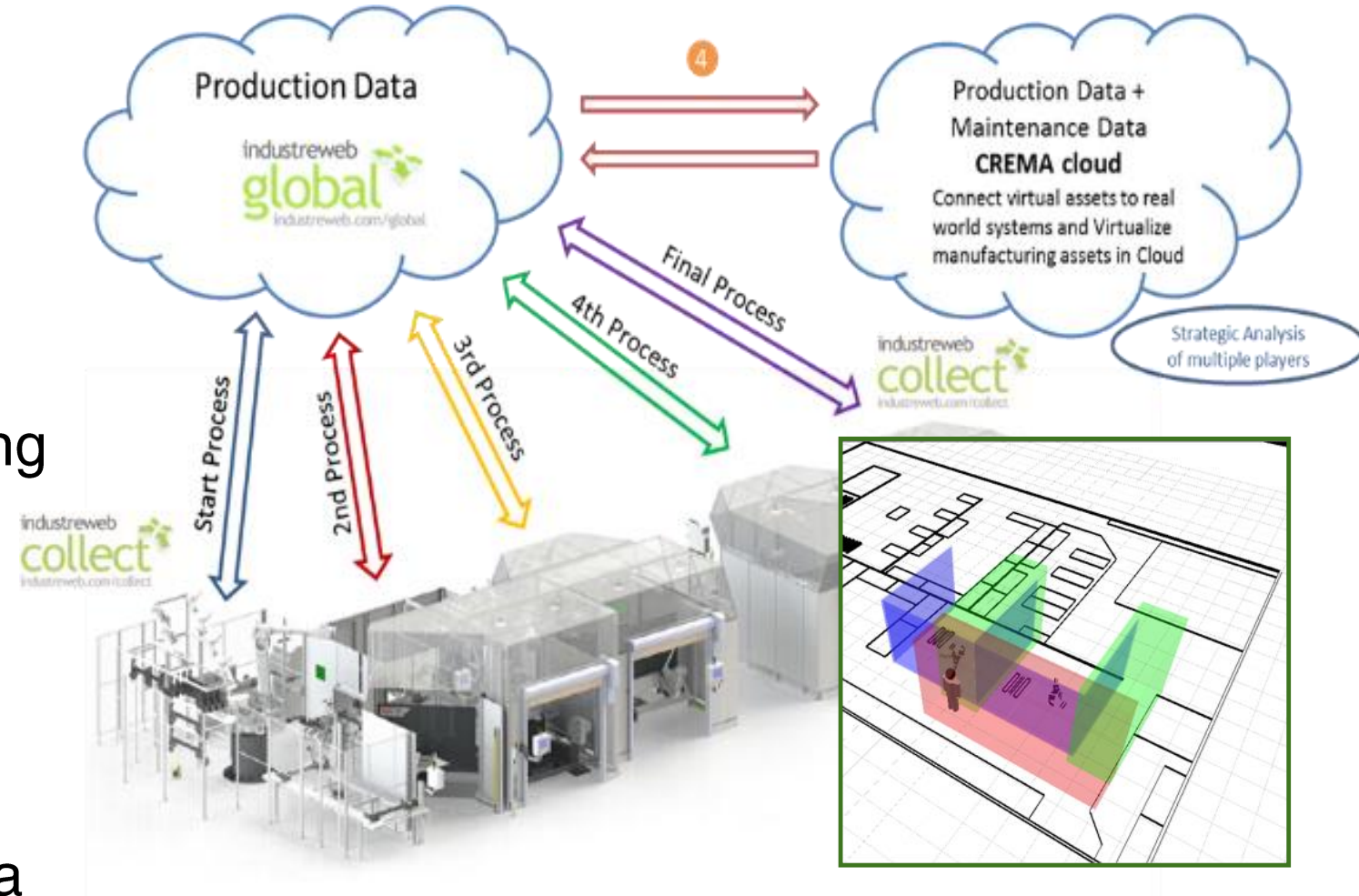
CREMAnufacture

- Exploitation of CREMA
  - Defined Packages
    - Collaborative Monitoring
    - Data Analytics
    - Optimisation
    - Tacking & Tracing
  - Connectivity to the shopfloor via Industreweb
 - Creation of a company to commercialise outcomes

Industreweb Business Case

- Industreweb as Glue between systems

- Outline costs
  - Cell (approx £9K)
  - Line (approx £24K)
  - Plant (approx £200K)
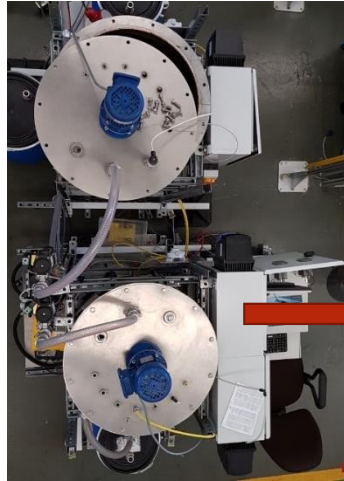
- Smart Data not Big Data - Fog computing approach

Demo - Setting the scene

- Prototype scenario - cosmetics manufacturing process

  – Wide selection of process types for our example

    - Process Control

    - Assembly

    - Pick'n'Place / Packaging

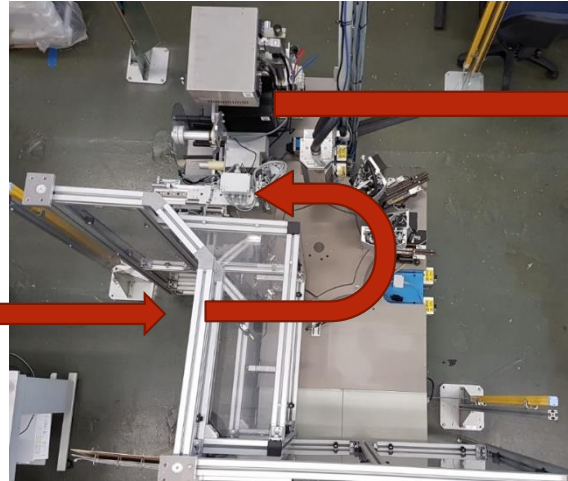- Industreweb 4.0 applied to orchestrate the process
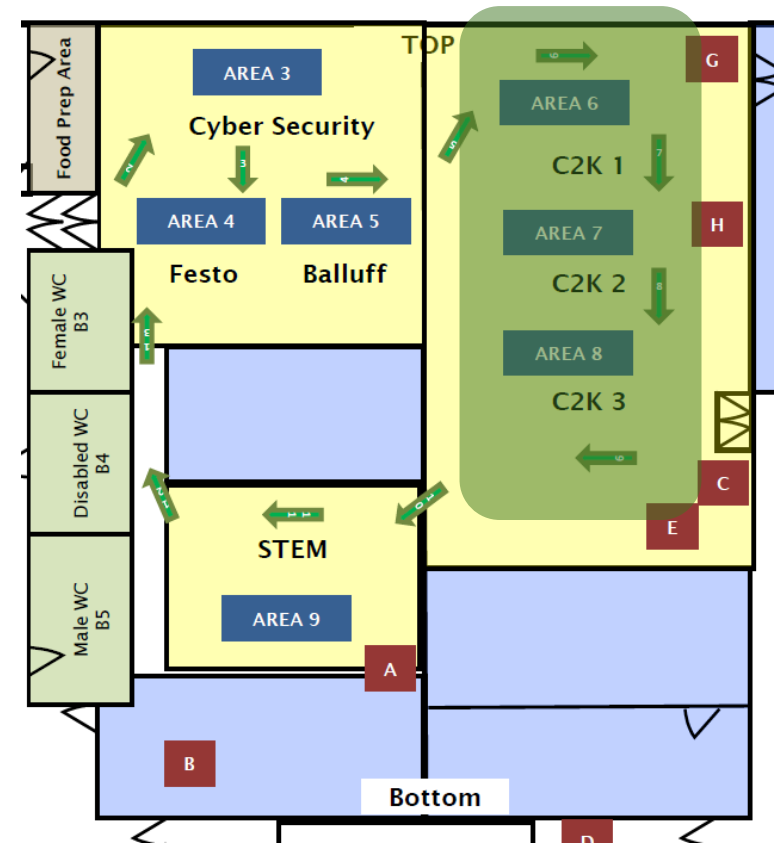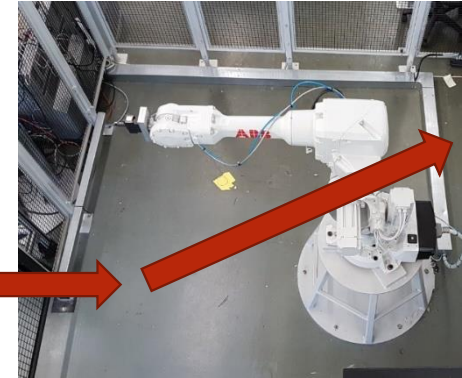
Prototype Area Layout

VR Suite
Vactory Digital Factory
(Area 8)

Decanting /
Processing
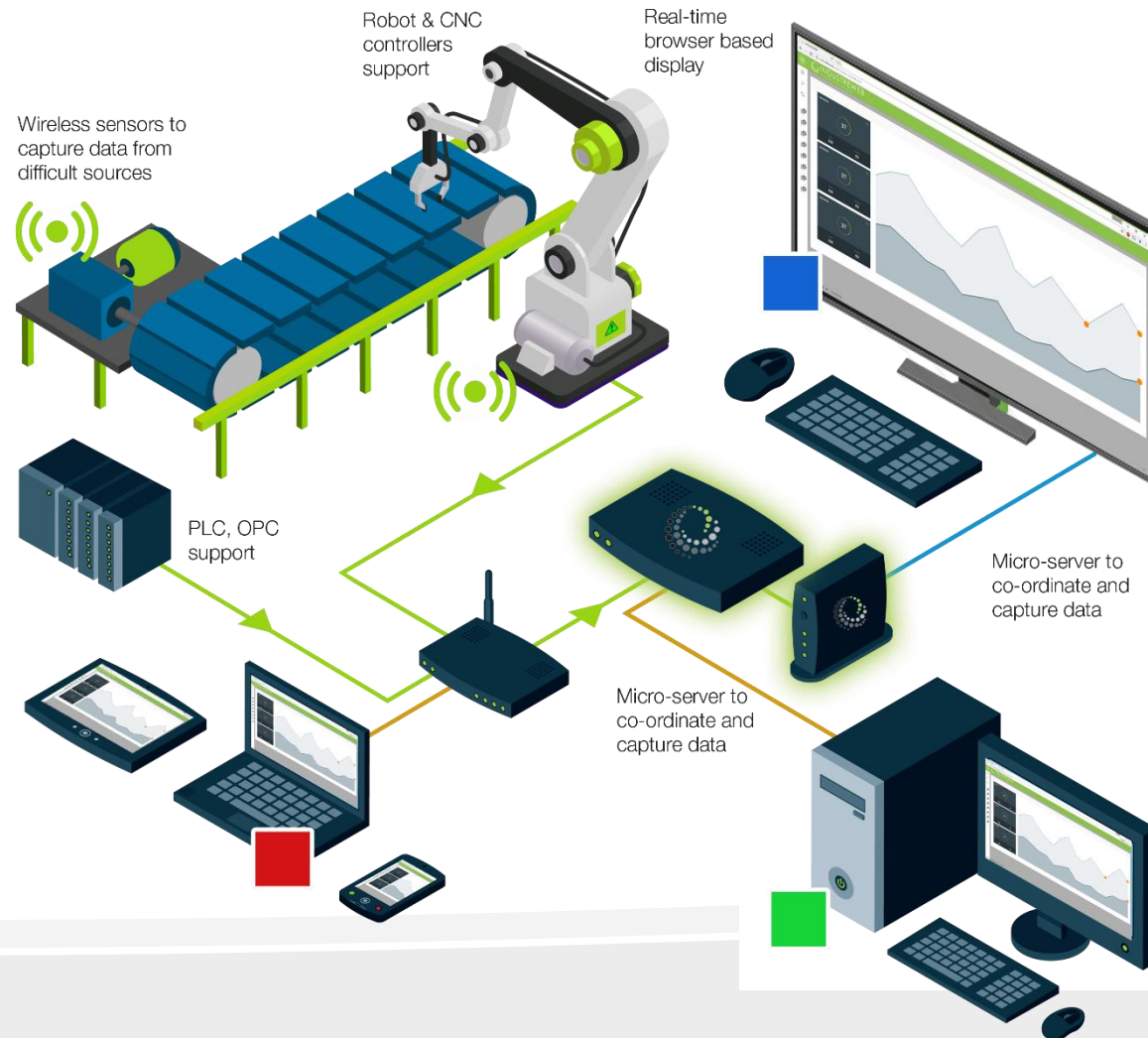
Filling / Assembly /
Machining

Pick and Place /
Packaging

ANDON
+
Knowledgebase
(Area 7)

Work Instructions
+
Error Proofing
(Area 6)

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Application of Industreweb 4.0

Wireless sensors to capture data from difficult sources

Robot & CNC controllers support

Real-time browser based display

PLC, OPC support

Micro-server to co-ordinate and capture data

Micro-server to co-ordinate and capture data

- Interfaced with all sources of data
  - Siemens PLC, Omron PLC, Wireless, ABB Robot Controller
  - Actively monitoring and acting upon events

- Visualisation via a responsive web interface

- Notifying via SMS, Email, IM

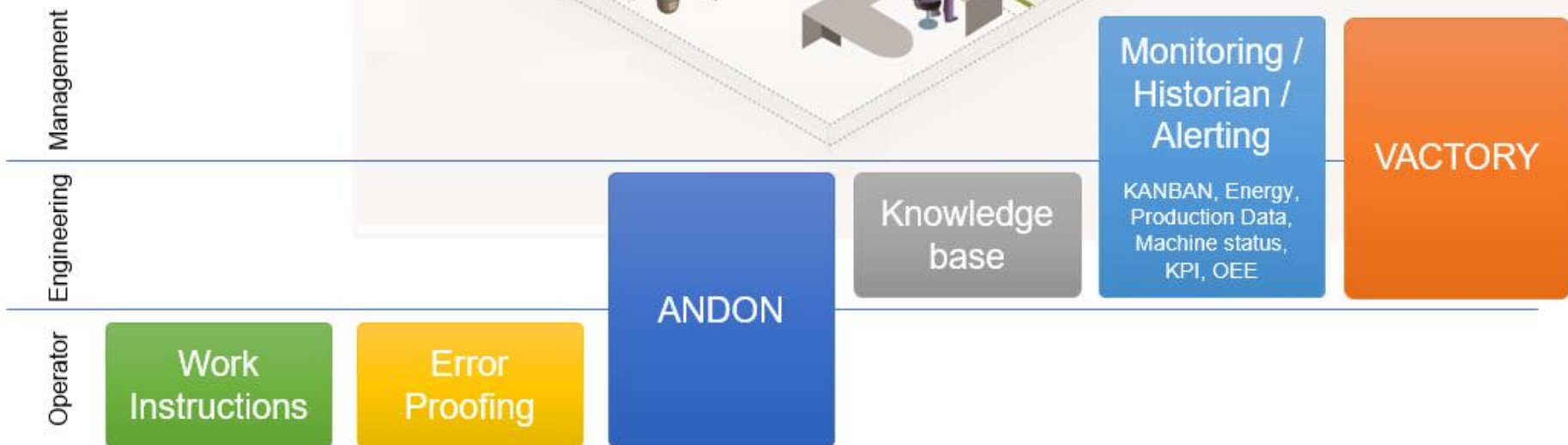- Data Store integrated

- 5 Products to be demonstrated

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Toolsets provided:

Operator – Work Instructions (Area 6)

- Train up, work instructions - m/c setup, changeover, strip down

- Deploy documents shopfloor wide

- PDF, Video, Images

- Version control so only the right documents are available

- Built in Audit trail

- Product changes are communicated to key machines e.g. the mix in a specific product

Operator – Error Proofing (Area 6)

- Guidance to operators tasks

- Detecting human error

- Prompting for corrective actions

- Interlocking processes to prevent safety or quality issues
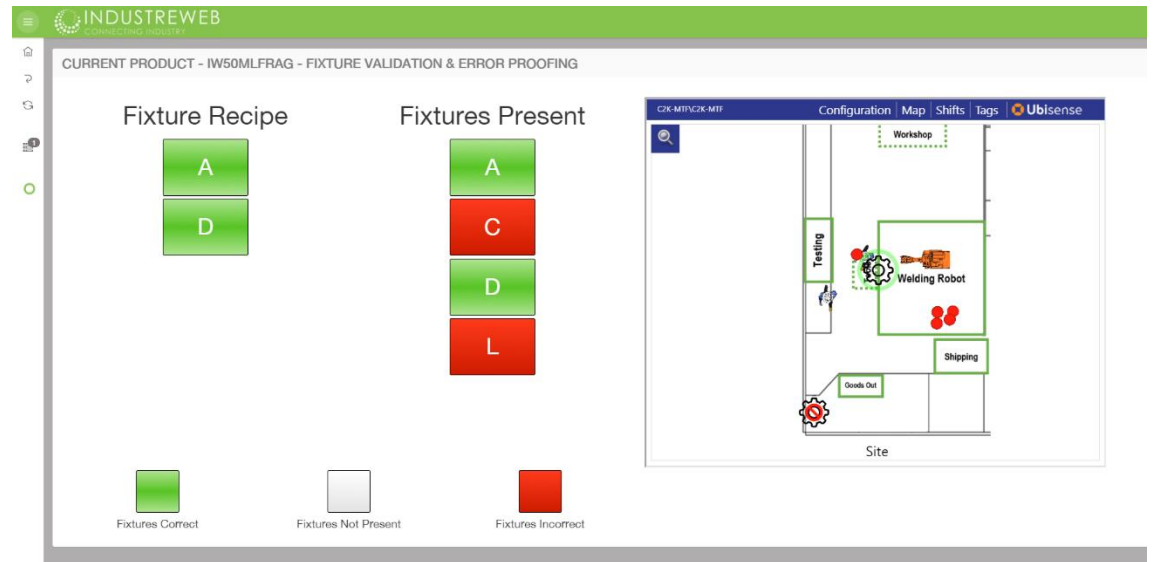
Operator / Engineer – ANDON (Area 7)

- Raise alerts based on Quality issues and machine stoppages e.g.
  - Air pressure issue
  - Label type / positioning
  - Fitting bottle nozzle & top

- Alert machine stoppages

- Notify engineering staff

- Create alert escalations for long running faults

- Track resolution times and stoppage reasons
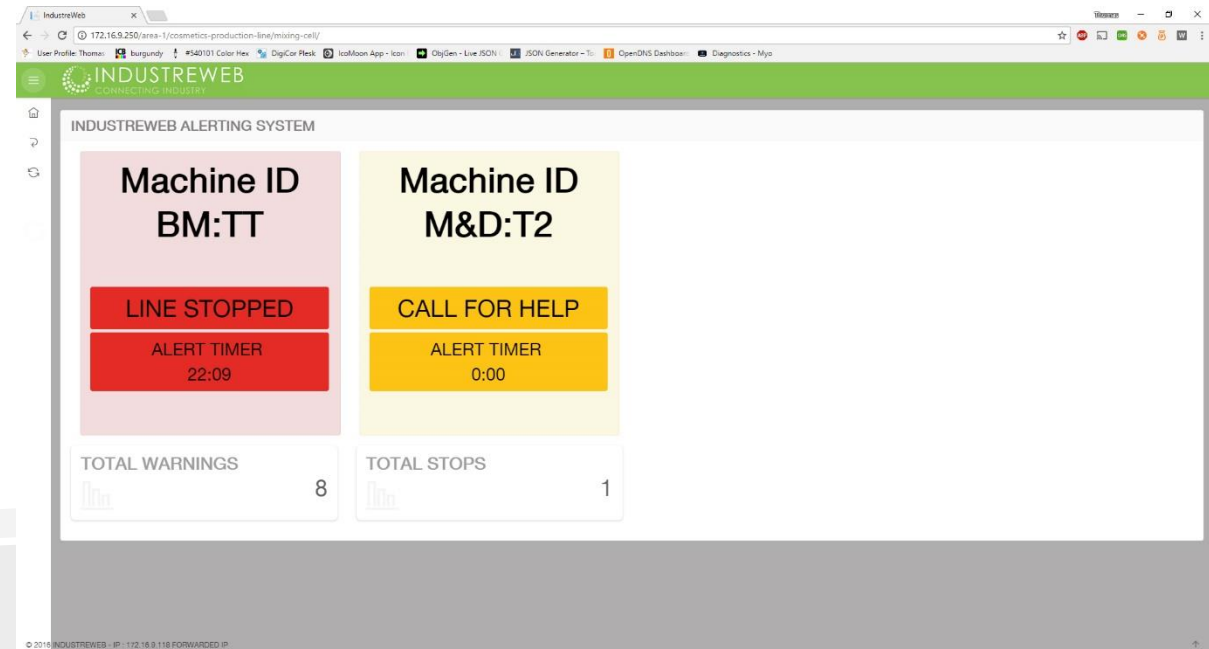
Engineer – Knowledgebase (Area 7)

- Capture valuable fault resolution knowledge

- Rate approaches to fault resolution so you learn from what works best in practice

- Support for common media types

- Trigger fault resolution methodologies when PLC error codes occur
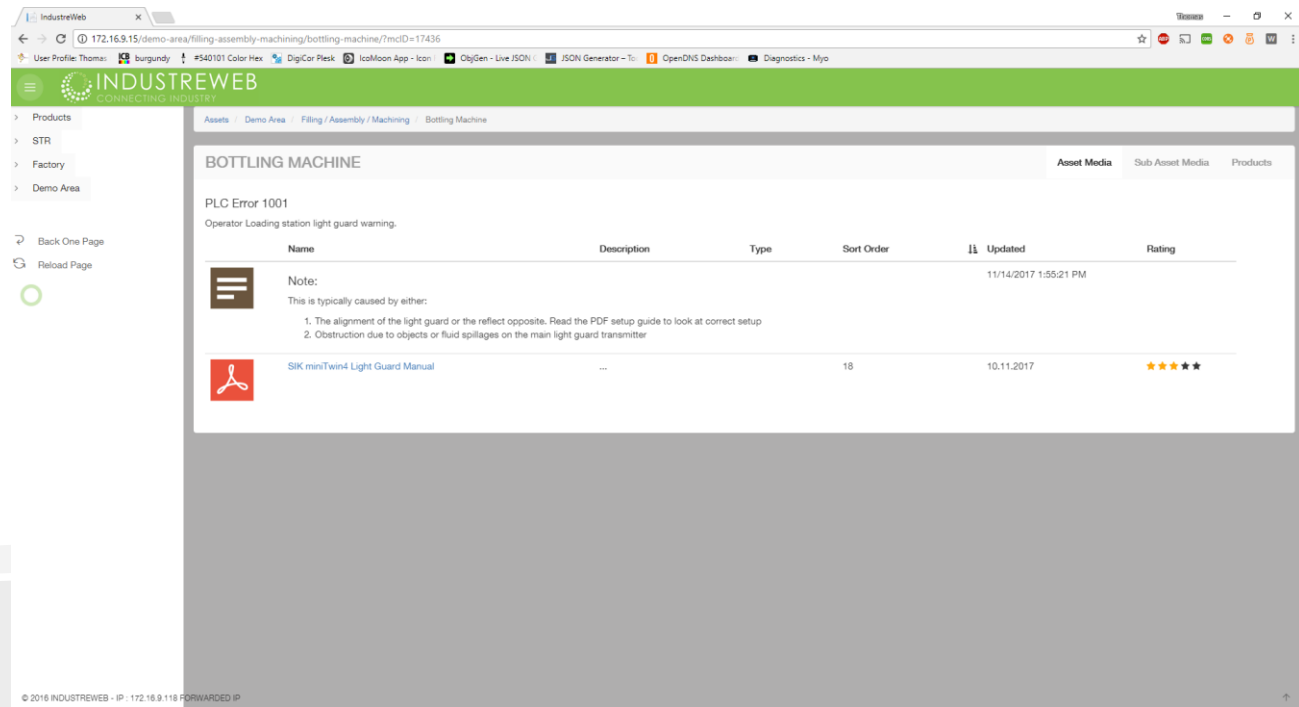
Extended Use Case for CREMA – VACTORY (Area 8)

- Visualisation of Digital Twin of manufacturing process

- Overlay key production measurables
  - Energy, OEE, KANBAN status etc…

- Invasive machine monitoring

- Support for Virtual production assets

- Support for Gesture Bracelets and Voice control

In Summary

- Translating research into products that solve real customer issues

- Taking a real world approach that recognises the realities of production demands, and influencing factors such as cost, risk and trust

- Be able to demonstrate the results

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