



Valmet – AISA results 21.11.2024

Pre-steps for the Industrial Internet

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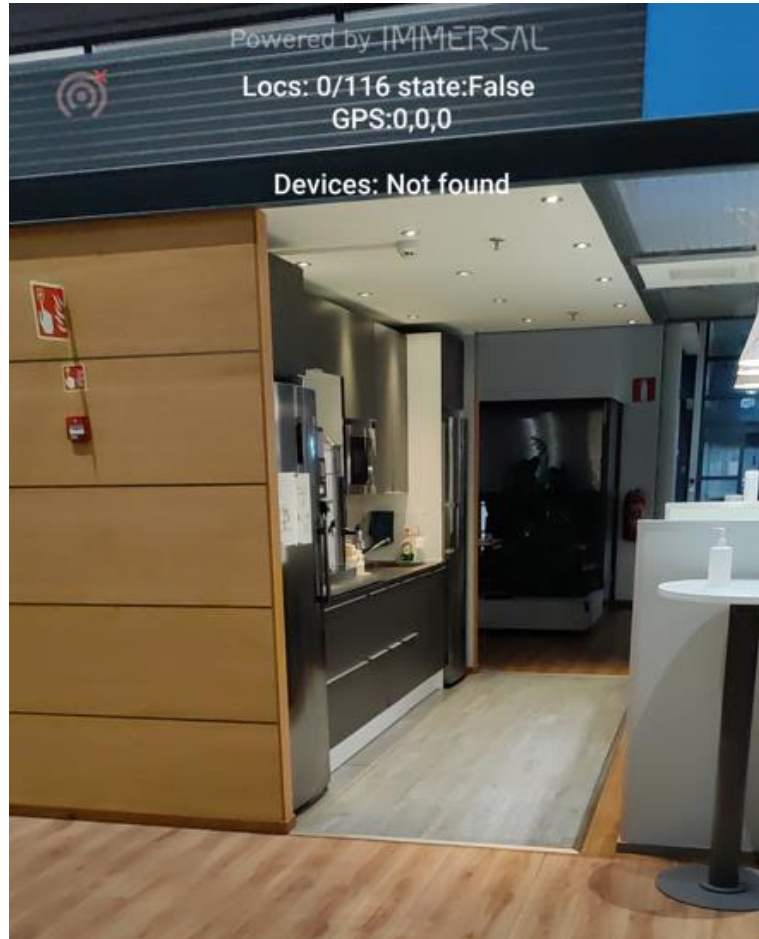
Concepts tested

Steps done during long research

- Immersal: Image based indoor location (pre-tested)
- Noccela: UWB based indoor location (currently used)
- AutoML: Object detector with field device classifier (Google)
- OPC UA Servers:
 - Digital Twin (NOTE: New better Digital Twin, part of Virtual Sea Trial FMI file based)
 - PA-DIM Process Automation Device Information Model based
 - Jetson Nano: Felt camera integration prototype for condition monitoring
- Valmet360 (proto-type):
 - 360 photo based WebXR application
 - Tracking time lapse progress on site
 - Remote service tool
 - Missing backend service integration
- Valmet Industrial Internet:
 - AI/ML (backend services), image based sensors – research on-going, no results yet (larger image bank needed)
 - Edge – Cloud hybrid solution backend
 - Fleet monitoring

AISA – Results for next generation industrial applications

Walking and camera-based VPS, find device(s) and show live values



Auto ML Poc - YLE news 8.2.2023

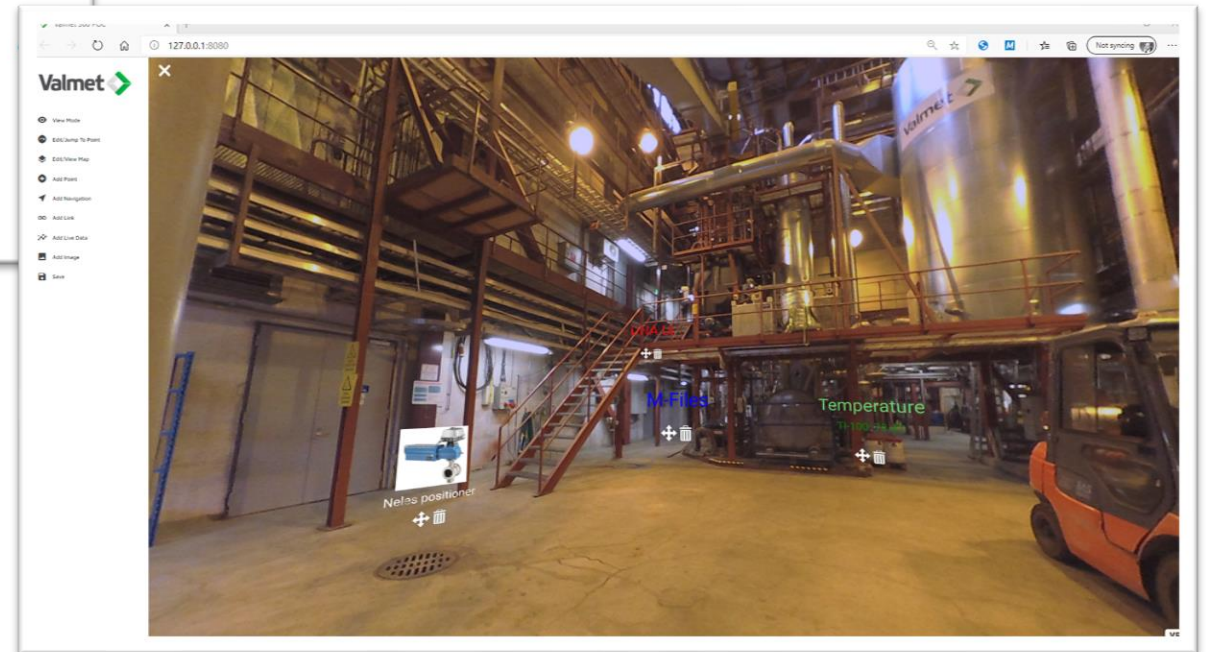
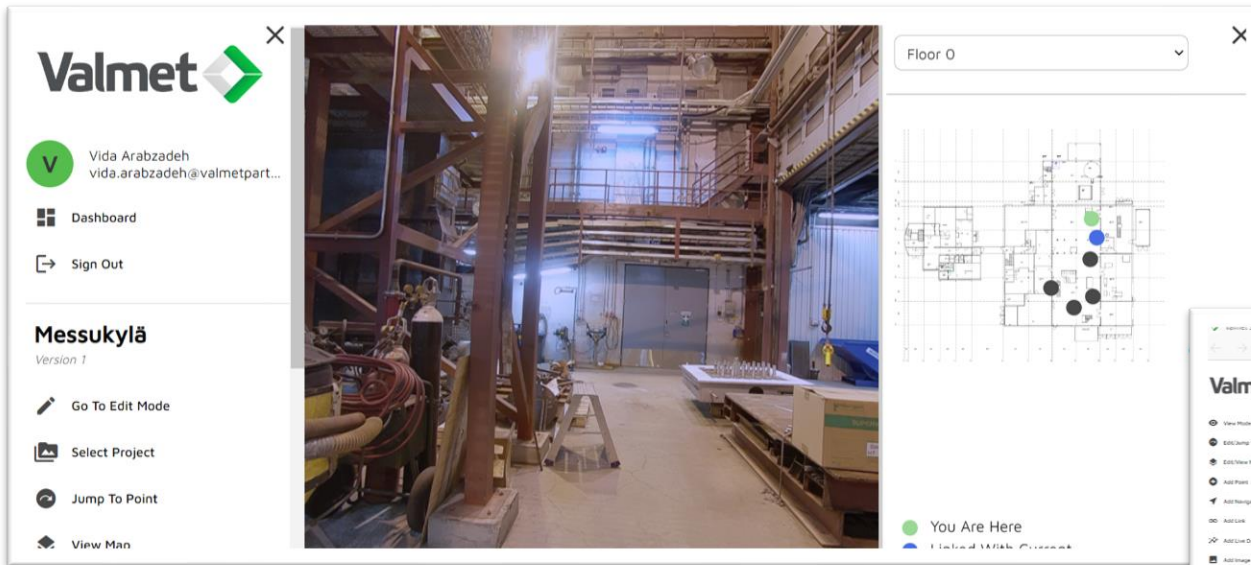
- Both 18:00 and 20:30 prime time news, proto-type shown



Found devices: 5 Time: 323ms

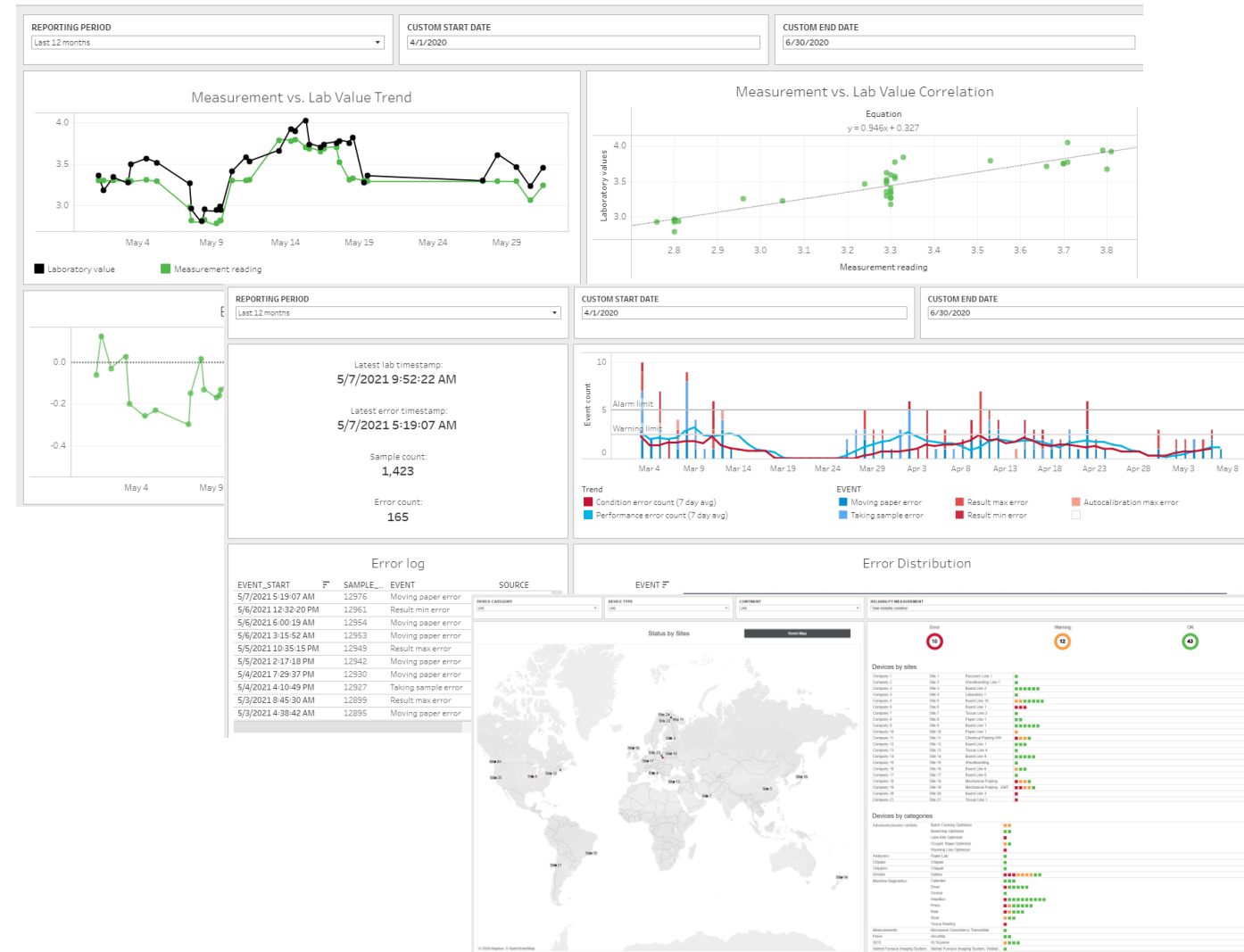


Valmet 360 PoC



Cloud based pilots

- Edge and cloud hybrid environment
 - Integration of cloud environment and on-premise servers
 - Alarm management PoC from cloud/edge to end user
- Backend services
 - Image data support
 - Device AI PoCs
- Fleet management
 - ML OPS process PoC for handling device specific models
 - Cost efficiency in handling data from fleet of devices
- Image data in Web break detection



Future work

- Proto-types will require refactoring & productizing:
 - DNA-PADIM-Server needs still some development & testing (AISA proto-type)
 - DNA-REST-API needs still some development & testing (AISA proto-type)
 - Web application: proto-type level implementation, UX design & testing needed (AISA proto-type)
 - Nokia RXRM (5G video stream optimized) & 3D Digital Twin (Gaussian splatting pipeline)
 - Research and further development with Doctoral Researcher Alp Aydin (AISA continuation) & Nina Flink (UX/AI)
- Vision for the Industrial Metaverse:
 - WebXR application needed for Field service
 - New Digital Twins to be implemented (Virtual Sea Trial project research, FMI & AI based)
 - AI Assistant to collect and show Asset/Process specific information (UX + AI)
 - 5G/6G private networks (Nokia co-operation)
 - Condition monitoring with DECT-2020/NR+ mesh network (USWA project)
 - Nokia Industrial Metaverse Veturi-program
 - Valmet Insight Edge solutions

