

ABB Smart Power - Vaasa, Finland

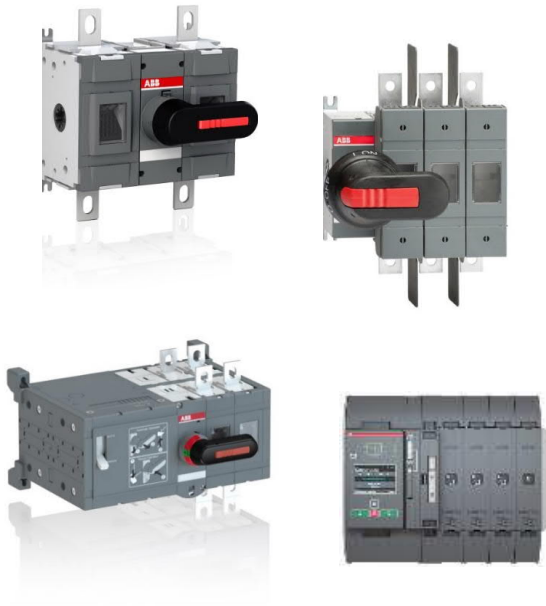
AI Foreman

Mikko Jukkanen



ABB Finland – Smart Power– Switches factory Vaasa

Key Info



- Product portfolio:
 - Produces switch-disconnectors, switch fuses, transfer switches, enclosed switches and cam switches
- A global factory that exports approx. 90 % of its volume
- Personnel ~ 250
 - 50 / 50 split between production and office roles
- Main R&D center for PG Switches & Fusegear

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Path to digital champion – AI Foreman

Current state

All production control done in MES system, including automation and employee production control

- Intelligent decision making in automation processes
- Touchscreen based assembly interface with dynamic working instructions
- Automatic KPI-data collection with visual dashboards
- LEAN manufacturing concept with features like takt time and exception reporting

Opportunity

With the factory already...

- ...having 1 robot per 4 employees
- ...collecting vast amounts of data
- ...having high level of digitalization

The question becomes:

How to lead a modern factory consisting of both robots and employees in an effective way?

Research for solution

As part Reboot IoT Factory program, ABB investigates the concept of AI Foreman, capable of...

- ...real time capacity planning and control between both robots and employees
 - ...ensuring versatile and balanced work
- ...real time feedback to/from employees
- ...making quality checks automatically using deep learning machine vision
- ...learning from collected data via artificial intelligence

Cutting edge research in the core of Reboot IoT Factory revolution

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Timeline in Reboot IoT Factory for PoCs related to AI Foreman

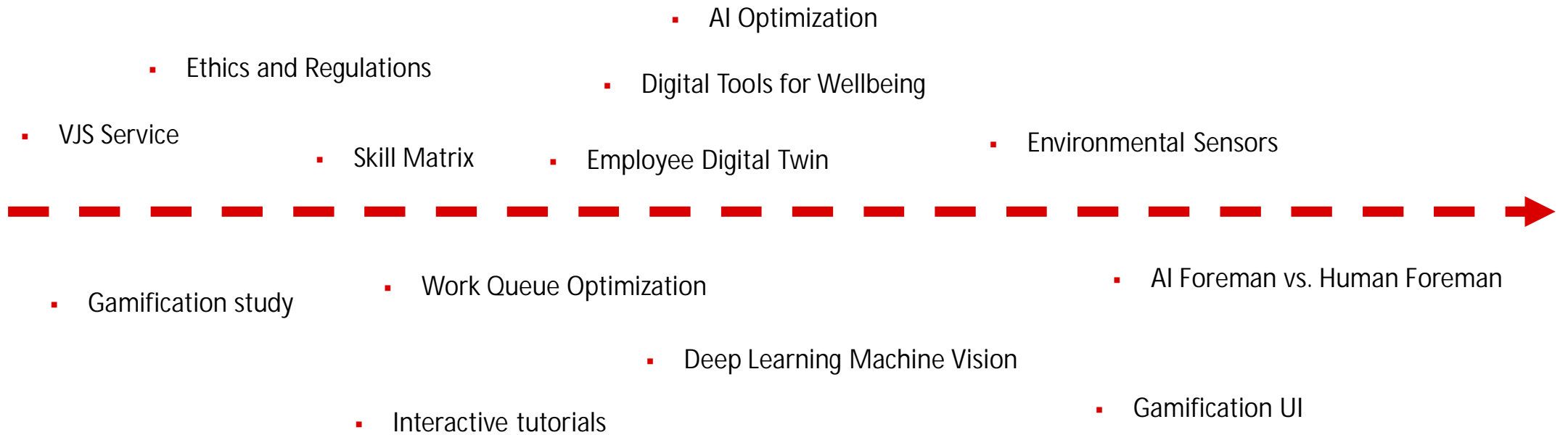


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Summary

- Participants: ABB, University of Oulu, VTT, Gambit Labs, Partagames, Devatus, Wapice
- Many of the PoCs done during Reboot are already in production use and generating profits.
- Next steps:
 - Fix issues and finetune AI algorithm for faster optimization in scheduling
 - Start using AI-assisted work queue scheduling in all functions
 - Expand employee digital twin to cover more data and start collecting data from all production employees
 - Combine all elements/modules and integrate all into AI Foreman connected to ABB systems (MES, ERP)

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Timeline in Reboot IoT Factory for PoCs related to AI Foreman

- Ethics and Regulations
- VJS Service
- Skill Matrix
- Gamification study
- Work
- Interact

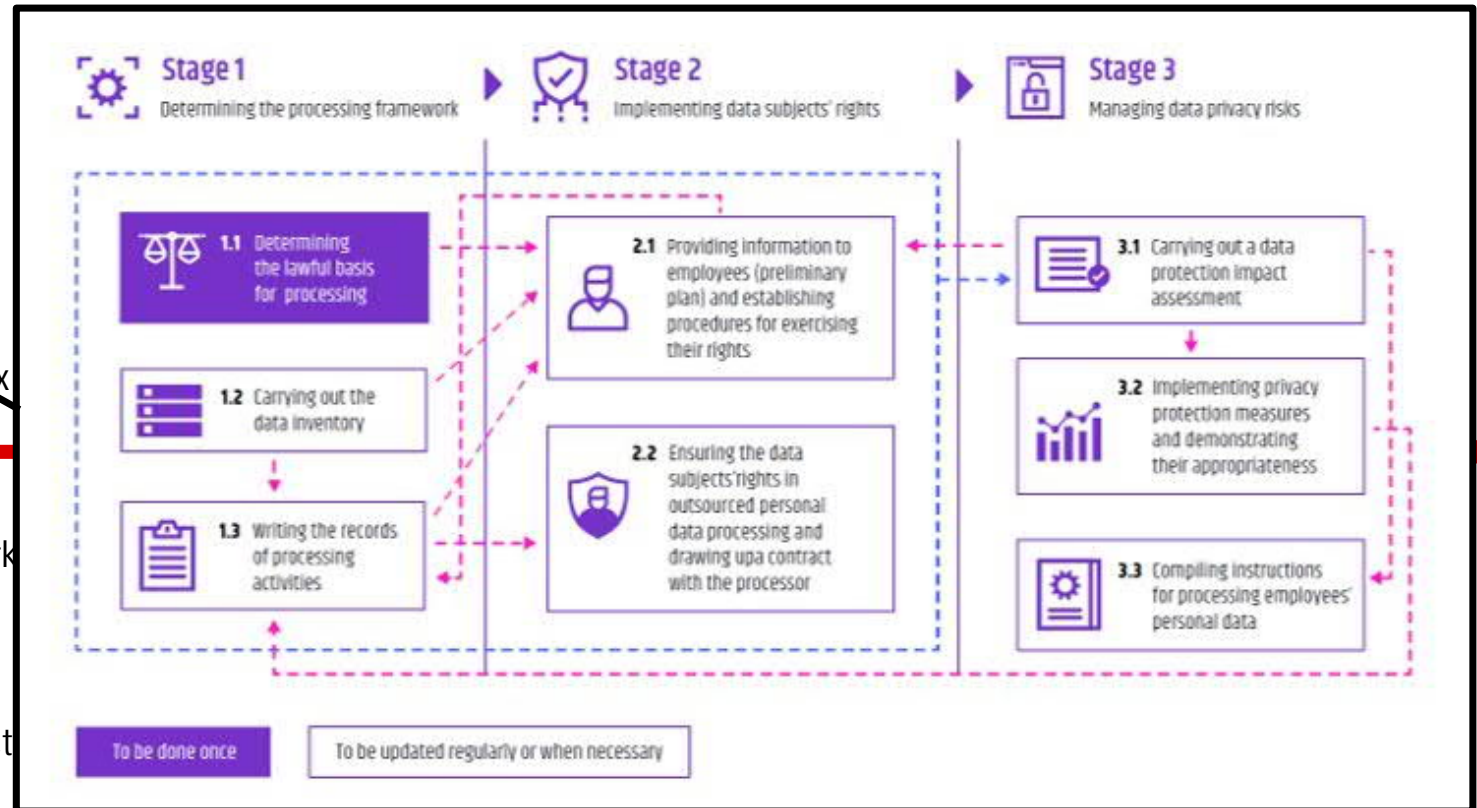


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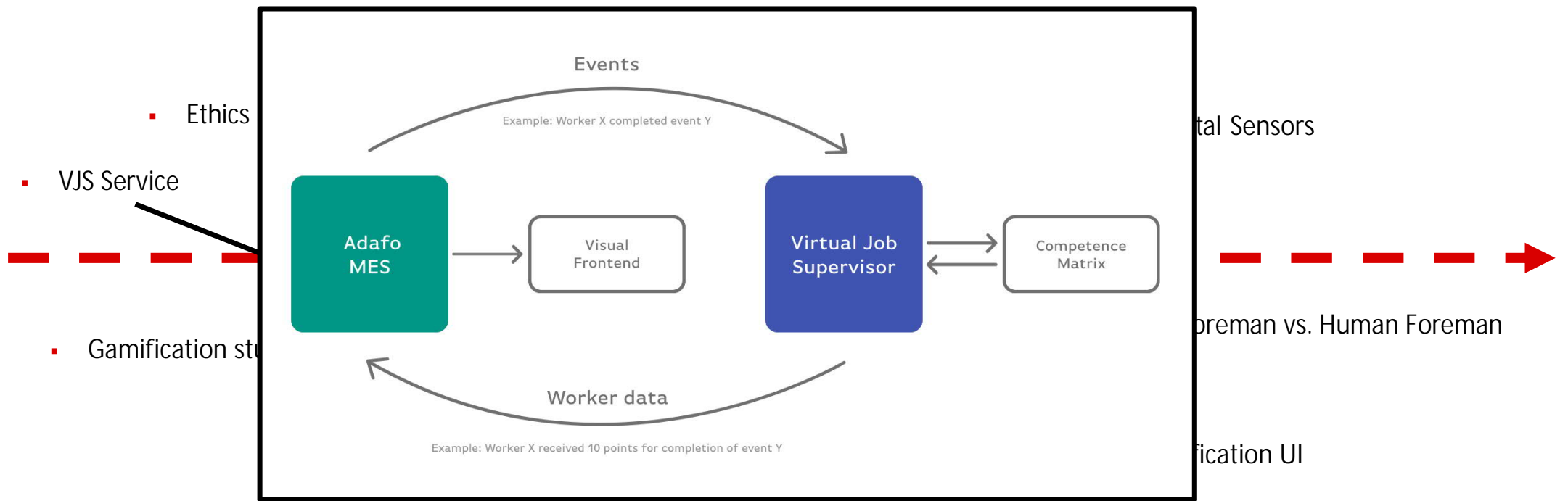


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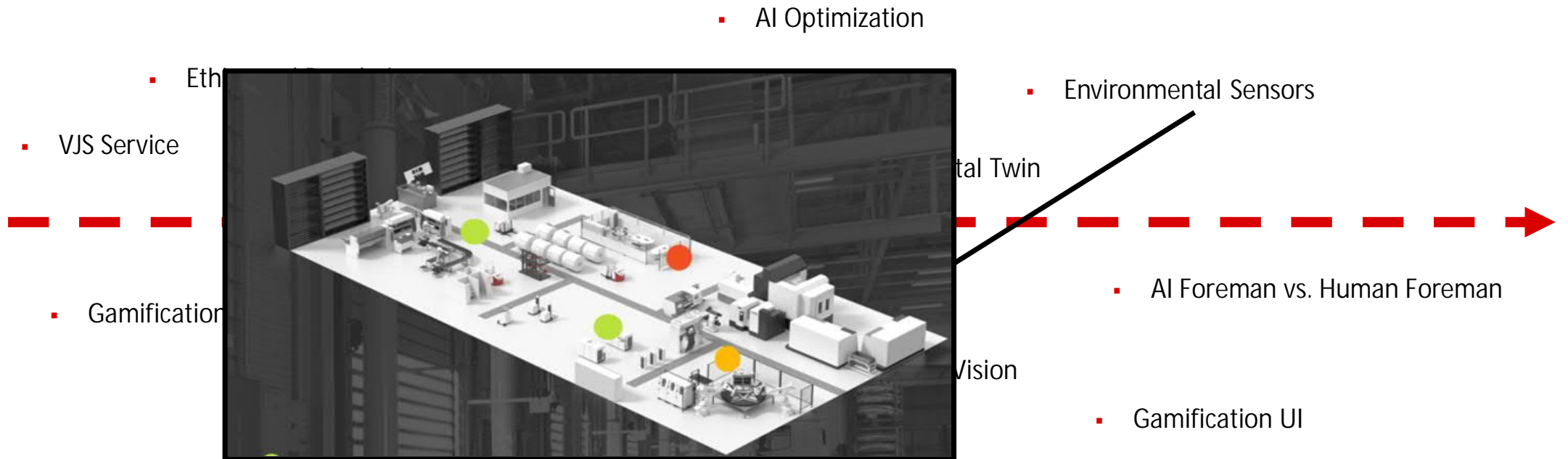
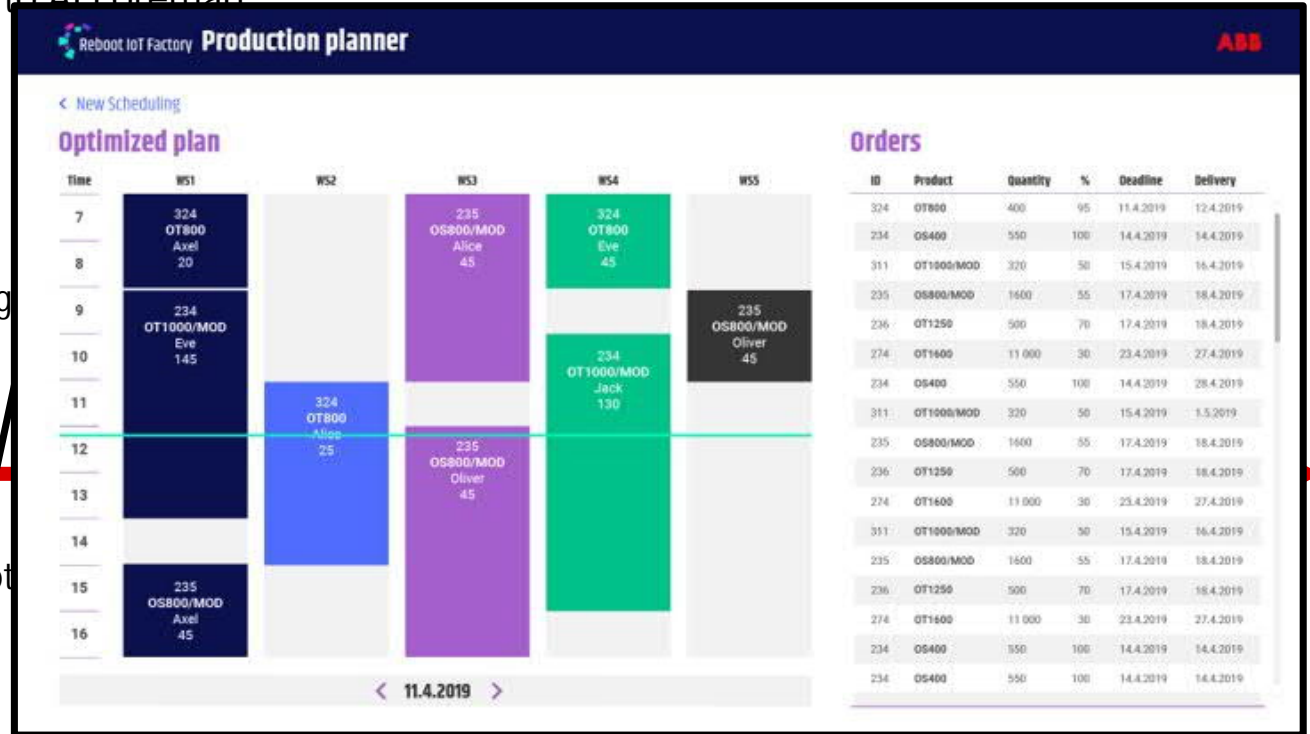


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Timeline in Reboot IoT Factory for PoCs related to AI Foreman

- VJS Service
- Ethics and Regulations
- Skill Matrix
- Gamification study
- Work Queue Opt
- Interactive tutorials
- Digital



▪ Gamification UI

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Timeline in Reboot IoT Factory for PoCs related to AI Foreman



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Timeline in Reboot IoT Factory for PoCs related to AI Foreman



- AI Optimization

Wellbeing

- Environmental Sensors

- Employee Digital Twin



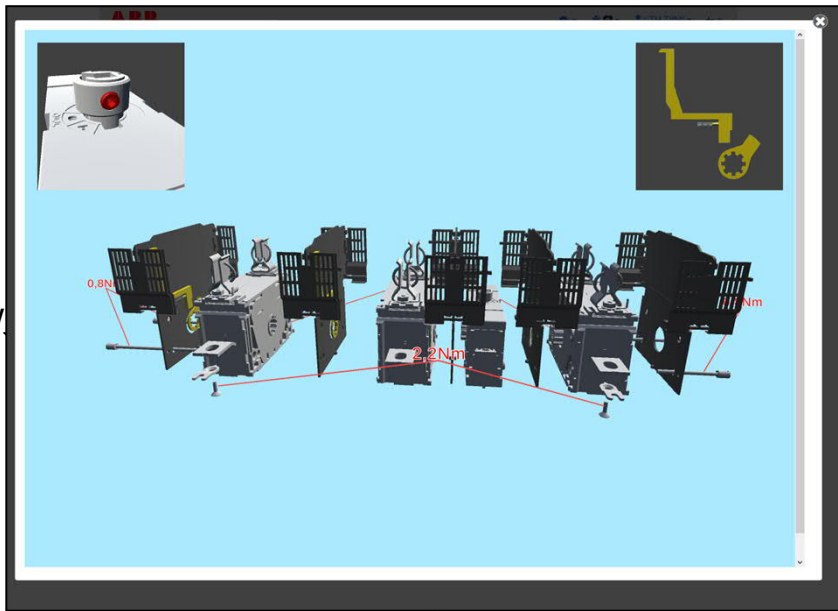
Learning Machine Vision

- AI Foreman vs. Human Foreman

- Gamification UI

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Timeline in Reboot IoT Factory for PoCs related to AI Foreman



- AI Optimization

- Tools for Wellbeing

- Environmental Sensors

- Employee Digital Twin

- AI Foreman vs. Human Foreman

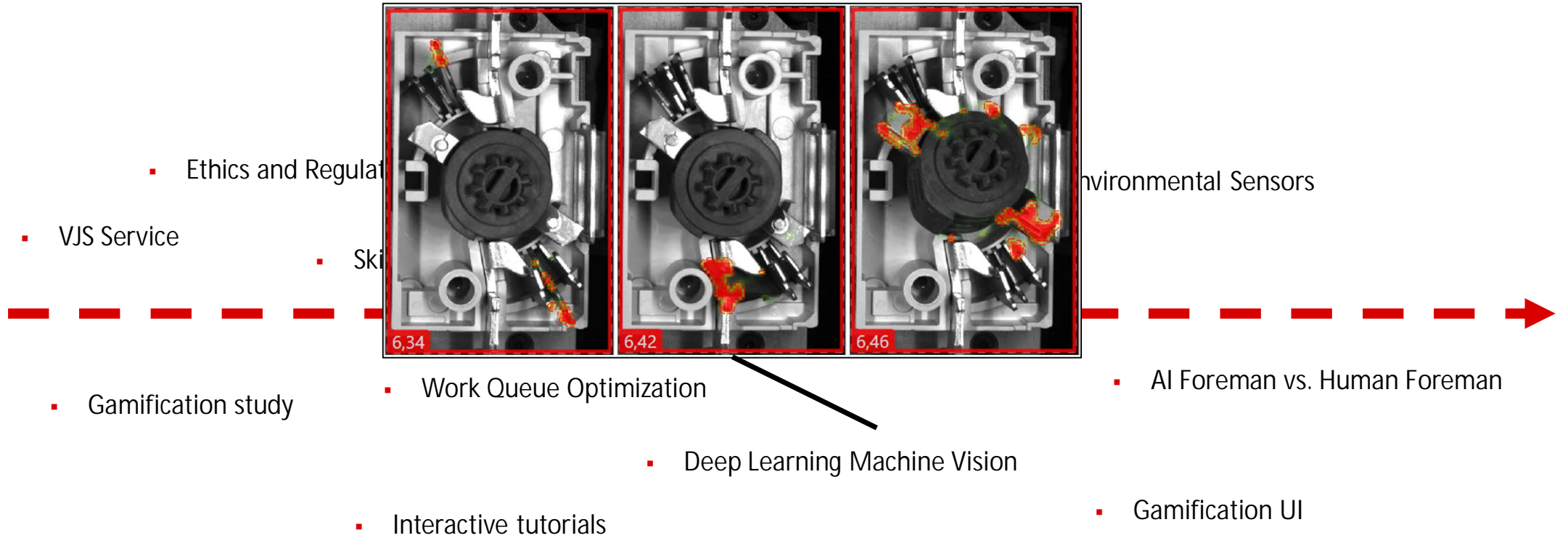
- Deep Learning Machine Vision

- Gamification UI

- Interactive tutorials

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Timeline in Reboot IoT Factory for PoCs related to AI Foreman



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