

# IIP

## The Industry 4.0 Journey with the Industrial Internet Playground Program

### Consortium

- Pulselabs, Belgium
- Troldekt, Denmark
- Aarhus University, Denmark

### Sector

MANUFACTURING

### Duration

14  
MONTHS

### Challenge

Change on the manufacturing shop floor comes with many challenges, not only technology, but business and organisational factors. Considering the unique processes in every factory there's no one-size-fits-all strategy to start digitalisation and continuous improvement projects. The Industrial Internet Playground (IIP) however is a service-design approach putting manufacturing firms in the right direction to benefit from IoT technologies. In our DIATOMIC supported case IIP enabled the digital transformation of a wood wool manufacturer with the mission to start predictive maintenance and reduce product defects. Working directly with three teams, co-creation methods explored the value stream problems, and lead to brainstorm and co-develop three unique IoT solutions in fields of Predictive maintenance of machine parts, Visual Inspection of products and Digital Twins for recipe optimisations. The three cases enabled the production team to reduce machine failure and boost product quality in a 12-week period.

### DIATOMIC Support

DIATOMIC has been instrumental offering guidance, timely coaching sessions and access to a network of partners that have provided new insights into technology and industry. Specifically, important has been the advice getting the scope right in this project and ensuring we have built a solution which can scale to a range of different manufacturing sectors

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### Solution

The IIP solution is a novel service offered at a fixed cost with a range of pick n' mix services that PulseLabs provide for Cloud, Big Data, Enterprise architecture and embedded computing platforms. Within a fixed time-range, typically of 6 weeks, a dedicated team of developers and engineers works the manufacturing client team to devise, design and deploy working solutions for specific manufacturing processes. IIP is the first of a kind Industry 4.0 enablement program which can boost digital maturity on the shop floor and kick start process innovation cultures in manufacturing teams. Our current results show we can build user-validated proof-of-concepts in a matter of weeks and have commissioned IoT solutions by the end of an IIP 6 week program. This is a major change to the 'death-by-pilot' that many firms are facing when getting start with new digital technologies.

### Lessons Learned

The benefit of working in a consortium is instrumental to supporting emerging business ecosystems like those around the Internet of Things – and key subsectors of electronics and systems integration. Without the Diatomic project formula we could not have developed IIP as a reusable format.

### TRL & Adopters

TRL level at the beginning of the experiment: **8**

TRL level at the end of the experiment: **9**

Number of early/first adopters raised during the experiment: possibly **3**

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### Timeline

Following the set Design, Develop and Market, the IIP project further incorporated three iterations of the IIP tailored program. This mean we had the opportunity to carry out three dedicated case projects in the same factory, on a common testbed. This also results in a continued engagement with the manufacturing partner, Troldekt beyond the scope of the DIATOMIC project.

### Stakeholders

Beyond the consortium partners of Aarhus university, PulseLabs and Troldekt, individuals from each team participated through in-depth exploration workshops and interviews. This included the CEO of Troldekt, their production and technical managers and several teams of operators and foremen.

### End Users

The end-users of IIP included many roles in a manufacturing process. Both operators and quality inspectors helped with a visual inspection logging device. Operators and senior maintenance engineers support a predictive maintenance wearable and both foremen and the external suppliers of the equipment participated to use the Digital Twin solution that was developed.

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### Key Results

A multitude of results were realised benefiting the partners of the project. PulseLabs has exemplified a method for digital process innovation in manufacturing, Aarhus University gained empirical data in the realm applied digital transformation and Troldekt reached goals to optimise facilities digitally, complementing recent expansions in production assets. Important insights around the themes of promoting digital lean culture, increasing stakeholder buy-in and barriers to starting innovation projects were found. For example, the use of co-creation workshops with end-users and sharing the results in the organisation encouraged positive engagement during the testing. Furthermore, the use of rapid prototyping and simulation systems helped focus the project scope for effective agile design sprints. To do this software such as Figma for visual UX examples and Node-Red for data flows helped non-technical stakeholders understand the features of concepts before committing to development. Lastly, the use of retrofit vibration sensors (the PulseLabs Checkmate Smart sensor) and inspection logging devices (such as the LineWatcher wearable app) provided data collection tools which could be deployed without any systems integration. The resulting data could then be accessed easily through Spreadsheet or PDF downloads or linked with business Intelligence software.

### Impact

The impact of the project at Troldekt has allowed the foundry team to both quantify previous un-measurable data points and provided objective insights, for them to make recipe changes and machine configurations in an informed way. The degree to reduce defect parts is promising and they can actually see these trends that were previously just gut feeling of experienced team leaders. Over 20000 defects have been reported since deploying the tracker in early 2020. For a wider audience the IIP program is to be promoted with the help of several Industrial Member Associations which will be offered to enable Industry 4.0 exploration in a guided way and provide a common space for members to discuss the results.

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### Testimonials

“The results have been surprising, and the deployed solutions have been received well by the line operators. We will continue to use the systems long term and will help manage quality in a data-driven way.

— Ole Busk Sørensen, Technical Manager at Troldekt

“The Industrial Internet of Things results show promise for the Centre of Digital Business Development, especially to understand the influences of Industrial Internet of Things. Going forward it is opening opportunities to reach many new case companies in the industrial sector.

— Mirko Presser, Centre Director & Associate Professor at Aarhus University

“The IIP Co-creation workshop trials were a great experience for us and our network. I would especially like to highlight the structure offered in the idea creation phase and helping us prioritise different ways to move forward with our case-solutions. Definitely an approach we can use in our organisations afterwards.

— Karsten Dehler, CCO at it-forum

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