

# FT07.04\_2024 Industrial IoT

## IoT-drevet forretningsdesign – digitalisering af virksomheder og samfund



## Indledende oplysninger

<b>Indsatsområde</b>	IoT-drevet forretningsdesign – digitalisering af virksomheder og samfund
<b>Institut</b>	FORCE Technology
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## Revisions

This is the first version of the activity description for 2024. It builds on activities and results completed in 2023.

## Description

### Objectives

The activity plan for 2024 is building on the learnings and on the services developed during the activities from 2021, 2022 and 2023, and has the following general goals:

1. Development of a sustainable production service based on the Factory Sustainability Assessment learnings (developed in 2022 through FT07.04 and tested and refined in 2023 through FT07.04, MADE, EDIH AddSmart and EDIH TechCircle activities), with the aim of supporting manufacturers in their transition towards a more sustainable production
2. Refining of the Digital Factory Mapping service (partly refined in 2021, 2022 and 2023 through FT07.04 and Industriens Fond's Digital Factory Acceleration), with a focus on improving the efficiency of its tool (e.g. using learnings from Industriens Fond's Digital Factory Acceleration program)
3. Refining of the Digital Maintenance Analysis service (developed and refined in 2022 and 2023), with a focus on linking its analysis to additional implementation activities (e.g. through the establishment of a collaboration with TEF – AI Matters)
4. Gathering of state-of-the-art knowledge concerning sustainability-related needs and available technology solutions for supporting production companies in their transition towards a more sustainable production. This will support the development of an effective sustainable production service as well as the refining of the two existing Digital Factory Mapping and Digital Maintenance Analysis services (developed and/or refined in 2021, 2022 and 2023).
5. Integration and roll-out of the services developed and/or refined through FT07.04 in 2021, 2022, 2023 and 2024 (i.e. Digital Factory Mapping, Digital Maintenance Analysis, Factory Sustainability Assessment/sustainable production service) in the Danish national innovation system (e.g. through applications and projects in collaboration with e.g. MADE, EDIH AddSmart, EDIH TechCircle or Industriens Fond) to extend the reach of the activities and their impact on Danish industry.

The overall objective is to support Danish production companies in their transformation towards a more sustainable production by taking advantage of IoT, with a particular focus on small and medium-sized manufacturers.

### Content

The activity plan consists of a number of activities to support the achievement of the objectives above. These are:

### 1. Sustainable production service

Development of a sustainable production service, aiming at supporting production companies in their transition towards a more sustainable production by enabling sustainability data transparency in production, addressing the increasing demand from legislation (resulting in “license to play”) and from customers (resulting in increased competitive advantage). The sustainable production service is based on the learnings obtained from the Factory Sustainability Assessment-related activities (development and initial testing in 2022 through FT07.04, testing in 2023 through a MADE FSA samarbejdsprojekt, a EDIH TechCircle webinar and a FT07.04 customer insights mapping) and from the sustainability data collection project in 2023 through EDIH AddSmart.

### 2. Digital Factory Mapping service refining

Refining of the Digital Factory Mapping service, aiming at improving the efficiency of its tool and hence reducing its application cost (reducing the cost barrier for small and medium-sized manufacturers). The service refinement is based on the learnings obtained from its application in the Industriens Fond’s Digital Factory Acceleration program (2021, 2022, 2023) and on the previous refinements performed in 2021, 2022 and 2023 through FT07.04.

### 3. Digital Maintenance Analysis service refining

Refining of the Digital Maintenance Analysis service, aiming enabling the integration of follow-up implementation activities (i.e. linked to the identification, selection, setup and/or testing of condition-based and predictive maintenance solutions) to extend the guidance provided to companies interested in maintenance innovation. The service refinement is based on the learnings obtained from its application in the MADE Digital Maintenance Program samarbejdsprojekt in 2022 and from the “maintenance innovation needs investigation” performed involving experts from the University of Bergamo in 2023 through FT07.04. In addition to that, the service refinement to be performed in 2024 can rely on the establishment of a collaboration with TEF – AI Matters and its maintenance-related activities.

### 4. Knowledge generation

Participation in an international exhibition (e.g. Hannover Messe) to identify and report technology trends, needs and solutions for supporting the transition of manufacturers towards more sustainable production. This will support the development of an effective sustainable production service as well as the refining of the two existing Digital Factory Mapping and Digital Maintenance Analysis services (developed and/or refined in 2021, 2022 and 2023).

### 5. Scaling through Danish innovation system

Integration and roll-out of the services developed and/or refined through FT07.04 in 2021, 2022, 2023 and 2024 (i.e. Digital Factory Mapping, Digital Maintenance Analysis, Factory Sustainability Assessment/sustainable production service) in the Danish national innovation system, to extend the reach of the activities as well as their impact on Danish industry – with a specific focus on small- and medium-sized production companies. Other than continuing the ongoing projects in collaboration with MADE, EDIH AddSmart, EDIH TechCircle and Industriens Fond’s Digital Factory Acceleration and Afkobling, this will be done through the drafting and submission of new applications across the Danish innovation system (e.g., MADE, EDIH AddSmart, EDIH TechCircle and Industriens Fond) as well as through the establishment of new collaborations (e.g., DI Produktion)

## Stakeholders and collaboration partners

The activity plan builds on top of knowledge and services developed in 2021, 2022 and 2023 activity plans, and is now focusing on reaching out to end users for the adoption of the developed services and knowledge. Because of that, the collaboration partners will be functional to this goal:

- DI Produktion for the organization of an event presenting the Digital Factory Mapping within Industriens Fond’s Digital Factory Acceleration program.
- EGN network for the organization of an event presenting the Digital Factory Mapping within Industriens Fond’s Digital Factory Acceleration program.

- Aalborg University (CIP – Centre for Industrial Production) for the generation, publication, and presentation (lectures) of scientific knowledge linked to the application of the Digital Factory Mapping within Industriens Fond's Digital Factory Acceleration program.
- MADE for the organization of projects to apply the sustainable production service or for the organization of events to share the approach and the learnings.

## Synergies/collaboration with other projects

As part of the activity plan, coordination is ensured with other projects and activities described in the following, so that knowledge and services developed under the auspices of these become available to the target group:

### Other RK:

- "Fremtidens nøgleteknologier: avancerede sensorsystemer og fotonik", FORCE Technology (lead): specifically the FT08.02\_2024 activity through the participation in DeepTech Alliance (Industry 4.0 program), international platform bringing together start-ups in the Industry 4.0 domain and innovative corporate partners focusing on the application of new digital technologies in industry.
- "Fremtidens hybride testbed", FORCE Technology (lead): The effort contributes to the development of hybrid test bed facilities, including digital twins, methodologies that can be applied to enhance sustainability of production processes and machinery
- "Digitale teknologier til datadrevet, bæredygtig vækst", Alexandra Instituttet (lead) og FORCE Technology: Focuses on the application of digital technologies to empower the green transition in different sectors including industry such as 1) data platforms and digital twins 2) data analytics and artificial intelligence (AI) and 3) interaction and data visualization.

### FoU projects:

- "Digital Factory Acceleration", partly financed by Industriens Fond and partly by the participating companies, involving the application of the Digital Factory Mapping service for supporting Danish SMEs interested in increasing their production efficiency through digitalization.
- "Afkobling", fully financed by Industriens Fond, focusing on sustainable development and on the decoupling between economic growth and environmental footprint.
- MADE portfolio of projects – Manufacturing Academy of Denmark – within its MADE FAST current program, focusing on delivery performance, agility, sustainability and new competences.
- TEF AI-Matters: Artificial Intelligence Test and Experimental Facilities (TEF) for manufacturing innovation. The EU project contributes to increasing the resilience and flexibility of the European manufacturing sector through the dissemination of the latest developments in artificial intelligence, robotics, intelligent and autonomous systems.
- Furthermore, there will be extensive collaboration with the following EDIH projects:
  - o 1) "AddSmart", which is a large 3-year collaboration project in the North Jutland region, which aims to increase productivity in industrial companies and production companies through Industry 4.0 by introducing smart production in the North Jutland region. The purpose is to create a single entry point with easy access to common knowledge and resources about developments in digital production technologies at all levels. The project will be used to test the sustainable production service developed in the 2024 FT07.04 activity plan.
  - o 2) "TechCircle", which is a large 3-year collaboration project in the Central Jutland region that, with a circular perspective, aims to create a transversal green agenda in Central Jutland, by building digital capacity and increasing digitization in both private companies and public organizations through new use of data. The project will be used for acquiring data and for performing visualization activities, and then used to support the sustainable production service that will be developed in the 2024 FT07.04 activity plan.

Other performance contracts will be involved, and are expected to contribute in particular with several knowledge dissemination activities, including workshops, webinars, test cases, etc.

## **Advisory Board**

The activity plan has been presented at an Advisory Board meeting held on November 14, 2023.

## **Knowledge dissemination**

Results developed under the activity plan are disseminated via the Nordic IoT Centre ([nordiciot.dk](http://nordiciot.dk)) and associated stakeholders. The specific activities for knowledge dissemination are described in FT07.09\_2024 Videnspredning og økosystem.