XMANAI
MAKING AI UNDERSTANDABLE

Moving from 'black box' to 'glass box' Artificial Intelligence in Manufacturing

Newsletter #6 - May 2023

Ford Pilot

The Ford use case in the XMANAI project has the main objective of helping the engineers to make the best decisions in terms of optimizing production.
In the XMANAI platform, Ford will ingest, manage and analyse real-time and batch data acquired by Ford's corporate systems. The goal is to build novel XAI systems that contribute to providing recommendations for optimising line performance in the current and successive shifts. The hybrid and graph AI models that will be explored, trained and evaluated in XMANAI will allow different scenarios to be simulated.

Use cases and overview of timelines

The following two use cases have been identified in this project:

1. Holistic overview of the production with real-time representation of the production line, an unwanted scenarios alert system, and workload simulations. This use case is divided in three different tasks:

- Real-time representation of the production lines, visualizing the status of each of the operations, whether they are automatic operations, manual stations, warehouses and so on. In addition to the status of the stations, it will be identified which component is in each station at any given moment.
- A system for alerting unwanted situations that may lead to loss of line efficiency, based on real-time information provided by different data sources.
- Simulation of process changes. This task focuses on determining what would happen if some of the parameters of the production process were changed, using the data learned from the operation of the production line, machine states, efficiencies, cycle times per model, etc.

2. Automated production planning. This use case consists of developing an intelligent planner that takes into account the production plan, customer plant demand, available components, current production on the different lines, and so on. With all this information, the planner will recommend which batches should be made on which lines.

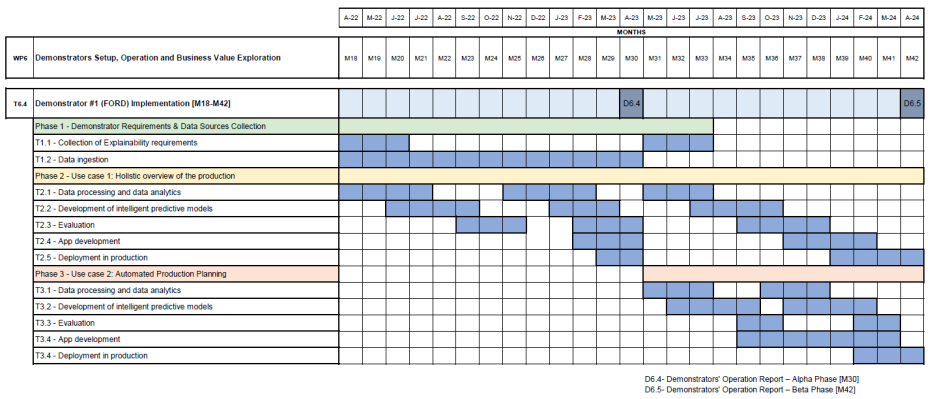

Figure 1: Use Case

Initial Results

XMANAI AI platform, manage and analyse the real-time and batch data acquired by Ford Corporative systems. The data will be use to build novel AI models that contribute to the provision of recommendations in order to optimize the line throughput of the current and successive shifts.
The hybrid and graph AI models to be explored, trained, and evaluated in XMANAI, will allow created alerts of different uses cases:

- Representation in real time of production and traceability;
- Simulation of some changes in the line production;
- Advices in the production batches in terms of size, mix, and schedule;

The actionable results of the AI algorithms will be leveraged in the Ford-specific application "AI recommendation App" that will be developed in XMANAI in order to communicate to the differnt engineers, intelligent automatic alerts and recommendations (through email and a dashboard showing in real-time and in the past the line/machinery status, the line availability and efficiency, and the events occurred during the shift that has altered the line availability or efficiency).

See more about Ford pilot:

XMANAI Hackathon event

This event brings together a diverse group of students, data scientists, and experts in the field of AI to explore the growing need for explainability in machine learning systems applied to manufacturing.

During this hackathon, you'll have the opportunity to work on real-world problems in the frame of our industrial demonstrators, and explore cutting-edge techniques for model development, interpretation, and explainable AI.

We have awards for the best solutions and the most active group in social media.

Register now to secure your spot: https://ai4manufacturing.eu/hackathon/

XMANAI - Explainable Manufacturing Artificial Intelligence

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