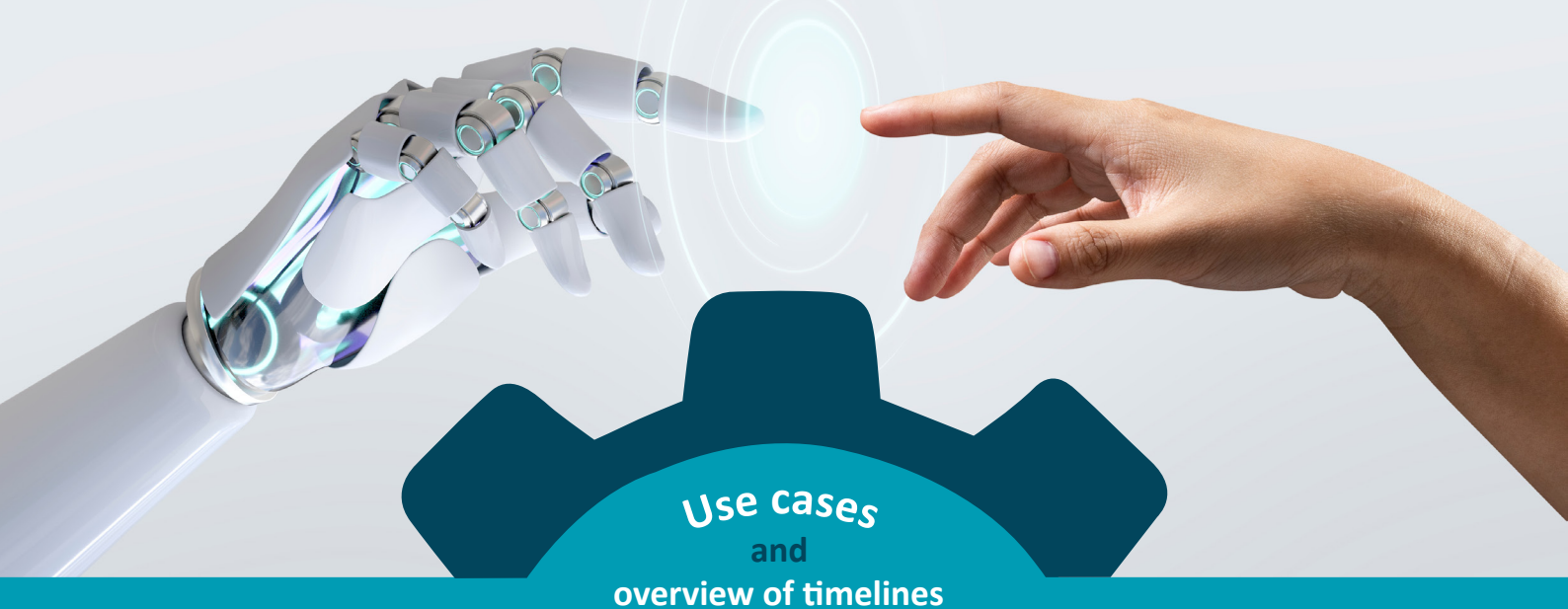




CNHi Industrial Pilot

CNHi Industrial is a world-class equipment and services company, a global leader in design and manufacturing agricultural and construction machines, that employs more than 64.000 people in 66 manufacturing plants and 54 R&D centers in 180 countries. The collaboration with European partners of the XMANAI project was developed within the San Matteo plant, located in Modena, Italy. It is the most relevant R&D unit in the field of tractors in Europe, using the most advanced technologies for design and engineering purposes.



The case studies selected by CNHi focus on the Modena production plant in Italy! In particular, the first use case focuses on machine downtimes that stop production for long periods of time, this means for sure waste of time but most importantly waste of costs for the company that could be avoided. Downtimes are usually due to replacement of defective parts or for maintenance.

At time, due to job turnover, inexperienced operators should reset the machine without the proper knowledge or the support from an expert one.

In detail, in the current state when the machine stops, the operator must exclude different parts of the machine step by step to get to the faulty component; so the operator in this way wastes a lot of time to understand the root causes of the downtime.

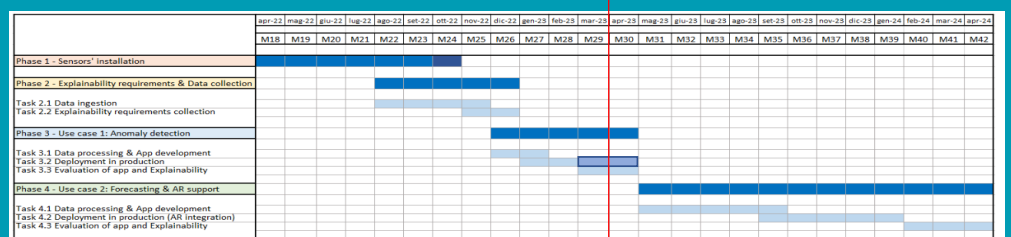


Figura 1: Planning of the CNHi demonstrator

With the use of XMANAI's platform, the user will be assisted in solving the diagnosis of the machine error with the support of AI suggestions that will be based on the values of the sensors installed on the machine that monitor its operational status. And if the operator is inexperienced, they will have a digital tool to help them replace the component with a step-by-step explained procedure.

The second use case regards the forecasting. The operator, thanks to the support of the platform, will be able to get suggestions as to which components might reach the end of their life soon.

As visible in the Gantt above, we are currently in the final part of phase 3 related to the first case study, with the development of the web-app that monitors the operational status of the machine and informs the operator of the correlation of the various sensors to a potential machine fault.

Initial Results

The benefit that XMANAI should bring to CNHi is, in short, timesaving during troubleshooting procedure. Approximately a time saving of 30 percent or more passing through the actual status to the first use case and another 10% passing through the first to the second. So XMANAI for CNHi means visible reduction of the time to reach the faulty part, saving cost for the company.

Other benefits the company expects to gain from participating in XMANAI are as follows:

- Reduce emergency maintenance: XMANAI should provide a set of data to the user, to help them identify the problem before the critical moment arrives (like for instance the breaking point of a component); this could generate a predictive maintenance plan that reduces the emergency.

- Reduce time/errors in machinery operations (maintenance/set-up/troubleshooting): XMANAI should provide suggestions with description of the problem and visibility on how the problem has been identified, moreover it should suggest the maintenance/troubleshooting procedure to be executed and the parameters to be monitored during production. XMANAI should support the Blue-Collar Worker in doing the maintenance/troubleshooting procedures with AR/XAI connection.

- Trust on XAI providing reduction of workload/stress of operators: XMANAI should provide an interactable Human-Machine Interface (HMI) able to navigate data from different devices including PC, tablet/smartphone, and wearable AR devices.

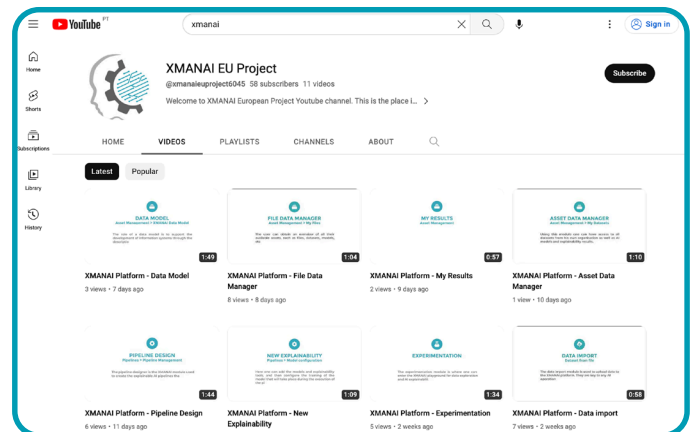
See more about CNH pilot: <https://ai4manufacturing.eu/cnhi-pilot/>

Dissemination and Project Activities



The last General Assembly of XMANAI's Project was in Lisbon, hosted by Knowledgebiz.

In the last General Assembly, the technical partners shared how their experience with the XMANAI platform (beta version) has been, each work package leader made a point of view of the WP and we agreed on the next steps.



The XMANAI Platform provides data scientists, data engineers and business/technical users a set of services that make Artificial Intelligence, step-by-step understandable and actionable at multiple layers (data-model-results). See how the platform works here: <https://www.youtube.com/watch?v=kn0W-LfB1dA&t=4s>

XMANAI - Explainable Manufacturing Artificial Intelligence

Topic: H2020 ICT-38-2020 - Artificial intelligence for manufacturing

From: November 2020 **To:** April 2024

Overall budget: €5 998 902,50



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