

# capri

## Press Release

September 2023

# An interoperable and replicable Cognitive Automation Platform via the use of Open-Source Components

The CAPRI Consortium is very pleased to announce the finalization of the validation phase of the CAPRI Cognitive Automation Platform (CAP), where all the Cognitive Solutions developed within the project have been integrated in a holistic solution, designed and implemented following the three main industrial domains' needs (namely Asphalt, Steel and Pharma) with modular and scalable characteristics.

The Cognitive Automation Platform ensures interoperability via the use of Open-Source tools capable to deploy cognition functions from the edge to the cloud. It is based of best of breeds European open-source community (i.e. FIWARE), complemented with worldwide OSS market leader such as APACHE.

It satisfies data management principles, as well as the data security aspects, since it has among its features:

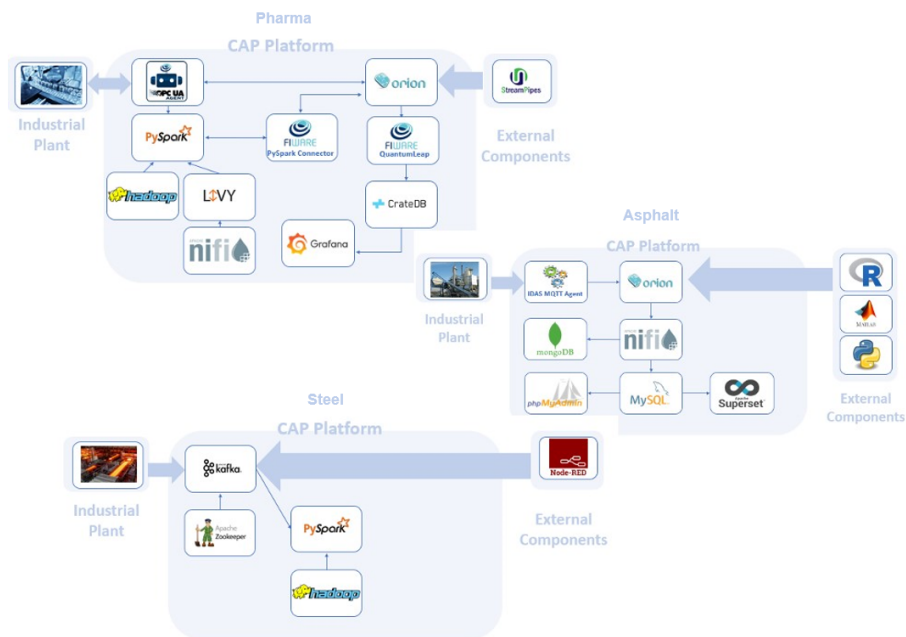
- Data Collection, ensuring that the required data is captured, from the data sources or produced as Cognitive Solutions output, and used for all intended purposes.
- Data Archiving wherever needed in a private, secure and trusted repository where is assigned an identifier for all the digital objects stored, ensuring easy access to the domain experts.
- Data Availability, so that data is accessible whenever needed by using free and standardized protocol like MQTT, HTTPS and OPC UA.



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 870062.

- Data Interoperability, by using NGSIV2/LD Data Model as a common data format in the industrial field compatible with several technological components, allowing an easy data exchange in the CAP platform.
- Data Security and Confidentiality providing authorized access only and policies are implemented for secure data access and sharing.

Reference Implementations of the CAP have been described in CAPRI Blueprints, where the corresponding practices identified for its deployment in the three domains provide evidence on the added value of the CAP for the whole Process Industry, including European SMEs.



**Figure 1: CAPRI Blueprints**

Among those, relevant OSS components and their integration with standalone applications have been improved in CAPRI use cases:

- In the *Pharmaceutical domain*, the CAP platform is able not only to ingest data from the industrial plant, but also to provide back the results of the Cognitive Solutions, thanks to the FIWARE OPC UA Agent. The bidirectional data synchronization feature offered by the OPC UA Agent is a new functionality put at the disposal of the FIWARE Community due to the specific need in the Pharma use case to store the data coming from Cognitive Solutions.
- In the *Steel domain*, the edge-cloud paradigm has been supported by the CAP platform via the use of two different OSS components: a part of the data processing is done in Node-RED on the edge, while the rest of the processing is done in the cloud using PySpark.
- In the *Asphalt domain*, due to the specific needs encountered in this domain, the CAP has been customized to interact with standalone applications, as external components written in different programming languages (Python, R, Matlab) using FIWARE Orion Context Broker. This has been leveraged to feed Cognitive Solutions and get their outcomes for the visualization layer implemented by Apache Superset.



The interoperability ensured via the use of OSS components and the CAP deployment at the edge represent the key elements of CAPRI replicability in the Process Industry, enabling the management of cognitive tasks and data collection, storing, processing and presentation directly from the plant.

More information on CAP platform deployment and the CAPRI Blueprints are accessible via the GitHub repository: [GitHub - Engineering-Research-and-Development/capri\\_cap\\_blueprints](https://github.com/Engineering-Research-and-Development/capri_cap_blueprints).

## About the project

**Project Full Name:** Cognitive Automation Platform for European PRocess Industry digital transformation

**Project ID:** 870062

**Start Date:** 01/04/2020

CAPRI ([www.capri-project.com](http://www.capri-project.com)) is a 42-month H2020 project that brings cognitive solutions to the Process Industry by developing, testing, and experimenting an innovative Cognitive Automation Platform (CAP) towards the Digital Transformation. To achieve that, CAPRI enables cognitive tools that provide existing process industries flexibility of operation, improving the performance across different indicators (KPIs) and state of the art quality control of its products and intermediate flows.

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