Press Release

March 2023

Asphalt use case

The CAPRI project encompasses three distinct use cases, one of which is focused on the Asphalt industry. Within the context of the Asphalt use case, the project team has developed five Cognitive Solutions with the objective of enhancing plant operation and reducing energy and raw material consumption.

The process industry faces a significant challenge in achieving efficient monitoring and control in situations where production processes or environments are complex. This challenge is particularly acute in harsh operating conditions characterized by high temperatures, abrasive particles, and excessive dirt in the environment.

In response to these challenges, the CAPRI project has developed five innovative solutions designed to optimize asphalt plant operation. These solutions are aimed at enhancing process efficiency and reducing the consumption of both energy and raw materials.
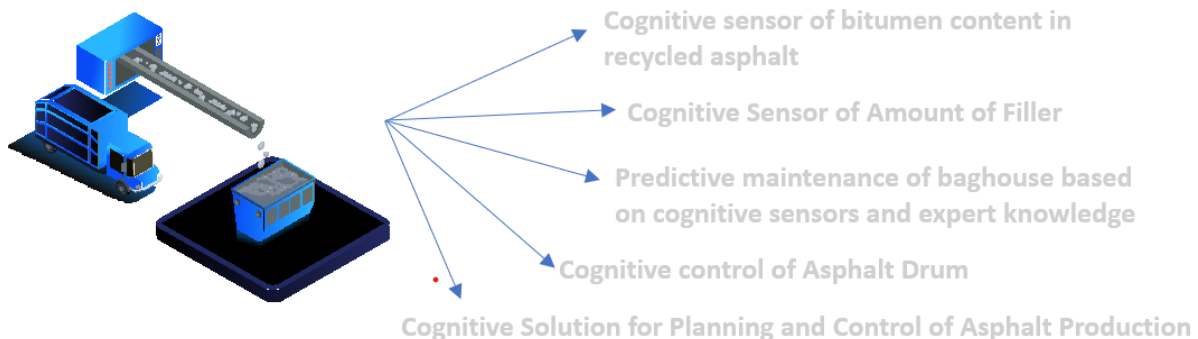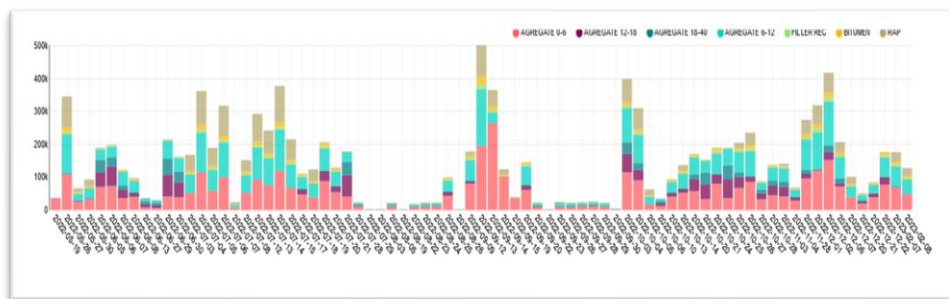

Figure 1: The five solutions have been developed within the Asphalt use case

Outputs of the Congnitive Solutions can be seen in the following figures:

One of the outputs of the asphalt use case pertains to the cognitive sensor that measures the amount of filler present in the cold aggregates extracted through the baghouse, in comparison to the production and the depressure of the baghouse. This key exploitable result of the project provides information on the amount of filler, or dust, in real-time. The development of this sensor is a response to the energy loss that occurs during the process of asphalt production. The heating, extraction, and re-addition of cold filler results in significant wastage of thermal energy. Factors such as humidity in the aggregates play a critical role in the energy requirements of the process. The sensor extracts only the excess filler not needed in the final recipe, thereby conserving thermal energy.

The second output derived from the asphalt use case is related to the planning and control algorithm. This algorithm allows plan operators to review the production per day, using a mass balance of the plant created by the CAPRI project. It provides information on the amount of each component used in the asphalt mix, which is essential for analyzing the real production capacity of the plant. This cognitive solution is linked with other cognitive solutions developed for the asphalt use case. It enables the realization of a mass and thermal balance of the plant, using sensors from the plant and the outputs of the cognitive solutions deployed inside the CAPRI project, along with an advanced algorithm that includes the corresponding process model representations in terms of mass and thermal balance.

The cognitive solutions developed for this project are based on a reference data architecture that utilizes open-source components based on FIWARE. This architecture facilitates the digitalization of plants, enabling the gathering, management, and meaningful visualization of data in dashboards that are accessible to various worker roles, such as operators, managers, and planners. The resulting Cognitive Automation Platform is modular, scalable, and replicable for other industries.

About the project

Project Full Name: **C**ognitive **A**utomation Platform for European **PR**ocess **I**ndustry digital transformation

Project ID: 870062

Start Date: 01/04/2020

CAPRI (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.

Three main technical objectives enabled by the development, testing and experimentation of an innovative Cognitive Automation Platform (CAP) for three use cases from process industry (asphalt, pharmaceutical tablets and steel billets and bars manufacturing), are being pursued:

- **Process Industry Digital Transformation & Automation** through digital technologies like data collection, storage, and knowledge extraction to provide detailed insights into process control and resource availability.

- **Improved performance and flexibility in the process industry** via digitalisation of process industries to dramatically accelerate change in resource management, improve their performance and flexibility and in the design and the deployment of disruptive new business models.

- **Next generation process industry plans** for their autonomous operation of plants based on embedded cognitive reasoning, while relying on high-level supervisory control as well as providing support for optimised human-driven decision-making.

Follow us

For additional information please contact

Project Coordinator: CARTIF
Cristina Vega Martínez criveg@cartif.es

Dissemination & Exploitation Manager: Core-Innovation
Nikos Kyriakoulis nkyriakoulis@core-innovation.com