2nd Press Release

AUTO-TWIN use cases analysis and requirements definition

The analysis of the use case scenarios represents a key activity to help the project to contextualise the main research activities into reference industrial domains and to identify applications to validate state of the art technologies. AUTO-TWIN includes in the partnership three different industrial pilots:

- **CROMA**, a surgical instrument supplying and management company
- **GR3N**, a company which developed a process for breaking down any type of PET and polyester into its two core components which can be then re-assembled to obtain virgin-like plastics enabling endless recycling loops.
- **Libattion**, a company which manufactures battery systems reusing cells coming from used batteries.

In the first six months of the project several workshops have been conducted to formalise the value chains of the end users identifying the actors in the market and putting in evidence the circular aspects, with a particular emphasis on the data that are already traced by existing systems, their availability, and possible additional information that could be tracked in the future adding additional sensors or data collection systems.

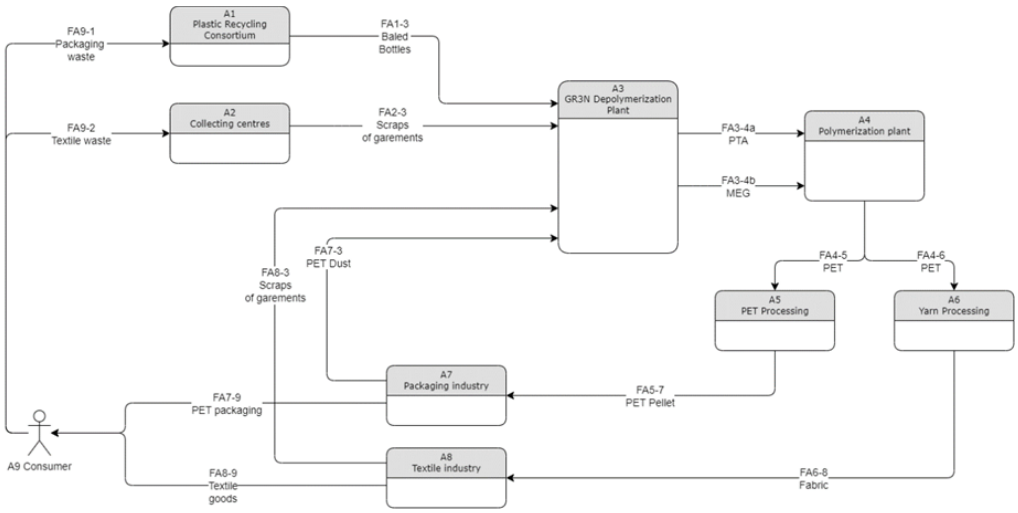

Figure 1 Gr3n circular value chain formalisation

This is essential from the perspectives of the automatic digital twin generation and the green gateways definition that represent the backbone of AUTO-TWIN. Each process of the industrial pilots has been inspected, detailing the process steps and the flows between them. Also in the process description, particular attention has been paid to the data that are already tracked or could be of particular interest for the next work packages.

An iterative work with the end-users has been carried out to understand their current needs, derive potential developments and to match each development with the project objectives ensuring a solid link between the technical objectives and the global scope of the project. At the moment the derived knowledge consists of a total of a well-balanced 39 specific technical objectives for the three use

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cases overall covered by 24 potential developments that represent challenges for the technical teams and will be converted into generalised results in the second phase.

As another keystone of AUTO-TWIN is the concept of Green Gateway, the decisions which can be taken by the user to influence the process have been mapped, to state which actors can take a decision, the moment in time and the steps of the process which are influenced by that decision. The objective is ensuring that the results of the project will provide value to the right people, at the right time, and above all, will determine real impacts improving industrial processes or parts of them.

To measure the effect of the aforementioned decisions and the application of potential developments, the KPIs that will be used to evaluate improvements in the process have been defined. The identified measures represent the most reasonable set according to the outcomes of the elicitation phase, and they will represent a solid ground to carry on both the development and the validation phase. Currently an average of 8 impact measures for each use case have been defined, anticipating at a very early stage the preliminary validation activities and laying the basis for a solid assessment of the outcomes.

ABOUT THE PROJECT

AUTO-TWIN: Data-driven method based on a process mining approach for Automated Digital Twin generation, operations, and maintenance in circular value chains is a 36-month project that is funded under the HORIZON Research and Innovation Actions.

AUTO-TWIN addresses the technological shortcoming and economic liability of the current system-engineering model by introducing a breakthrough method for automated process-aware discovery towards autonomous Digital Twins generation, adopting an (International Data Space) IDS-based common data space and integrating novel hardware technologies into the digital thread, to create smart Green Gateways.

CONSORTIUM

The Consortium is consisted of 13 partners from 7 countries and is under the coordination of the Politecnico di Milano.

CONTACT INFORMATION

Andrea Matta – andrea.matta@polimi.it

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