KYKLOS 4.0 newsletter #5

KYKLOS 4.0 – https://kyklos40project.eu

September 2022

An Advanced Circular and Agile Manufacturing Ecosystem based on rapid reconfigurable manufacturing process and individualized consumer preferences.

In this edition of the KYKLOS 4.0 Newsletter, discover the latest news about the project, including the developments on the KYKLOS 4.0 services based on the integration of the technical components into the KYKLOS 4.0 platform, an overview of KYKLOS 4.0 dissemination and exploitation activities as well as updates on KYKLOS 4.0 Open Calls.

Contents

KYKLOS 4.0

The project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement No 872570

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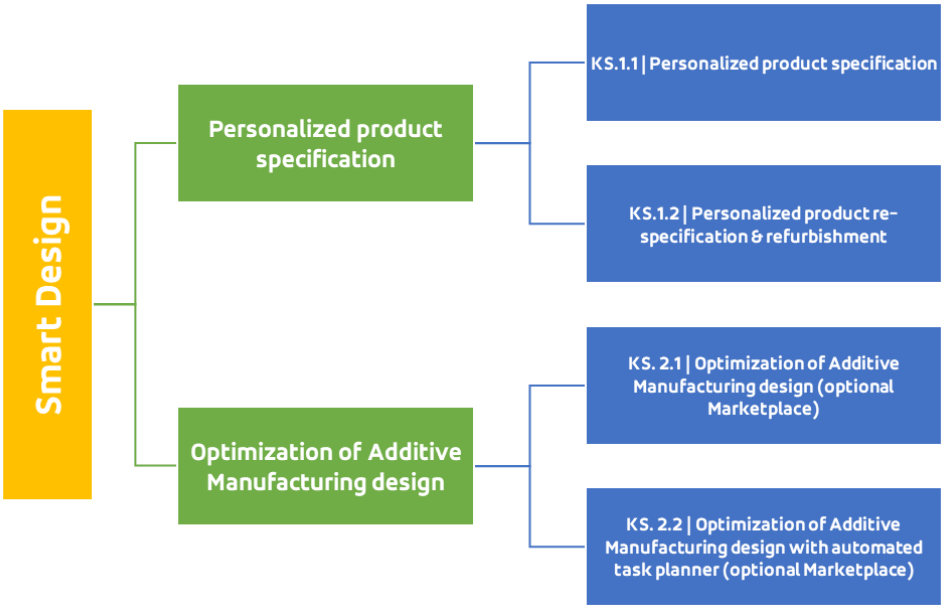
1. KYKLOS 4.0 **Services**

The services provided by the KYKLOS 4.0 Circular Manufacturing Framework are divided into two main categories, namely: Smart Design, and Production Optimization. The services that belong to each category are focused either on the manufacturing design phase or the production, as its correspondent category name indicates. Also, the services leverage functionalities related to product lifecycle management in each of the stages of the manufacturing process.

Each of the categories is divided into multiple sub-categories as follows:

Smart Design



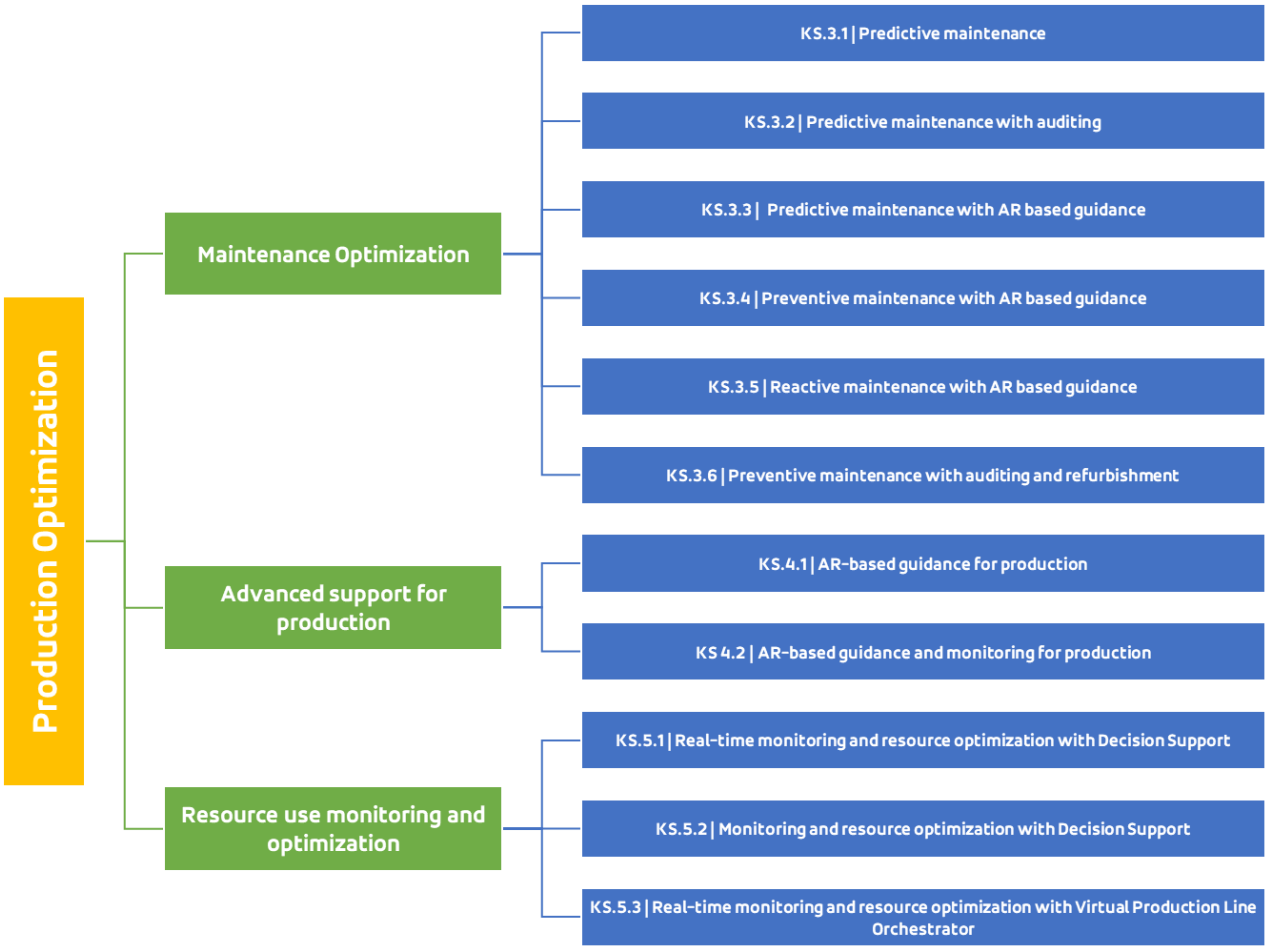
Personalized Product Specification

The services included in this sub-category support both the customer and the product designer. The service helps the customer provide the specific requirements

of an individual fully customized product. On the other hand, the product designer can convert the requirements defined by the customer into individualized product specifications and complete a customer-oriented design for additive manufacturing product by using KYKLOS 4.0 service. In this way, the design process runs efficiently and smoothly, which represents savings in time and cost.

Optimization of Additive Manufacturing Design

The services included in this sub-category support the product designer on the decision-making about the additive manufacturing design of a specific product in terms of best materials selection, best specification sizes and orientation or simulation of the final product. As a result, the manufacturing process is improved by accelerating and enhancing the quality of the design process and consequently, the KYKLOS 4.0 service provides enhanced operational effectiveness in terms of cost and time.



Production Optimization

Maintenance Optimization

The services included in this sub-category support the maintenance team (i.e., maintenance manager, maintenance supervisor, maintenance engineer, maintenance operator) which is responsible for the equipment part of the production line. The KYKLOS service guides the maintenance team on the optimal

management of the maintenance tasks, resources, and materials. The service includes artificial intelligence (AI) techniques for advanced data analytics to provide predictions concerning maintenance operations.

Advanced Support for Production

The services included in this sub-category support the manufacturing operator during the production phase, including preparation of the production, the production phase itself, post-production, and assembly. KYKLOS 4.0 services offer innovative technologies such as augmented reality (AR) and AI techniques for improving the guidance and support of the process to the operators.

Resource Use Monitoring and Optimization

The services included in this sub-category support the production manager or plant manager by monitoring in real-time the production as well as by providing simulation of the process in case some of the inputs change. KYKLOS 4.0 components also provide a decision support system based on the indicators calculated during the production phase in order to enhance both the production and the circular indicators. KYKLOS 4.0 also allows to orchestrate multiple services involved into the manufacturing process of a product line so all of them are synchronized and efficiently managed.

KYKLOS 4.0 services provide also product life cycle management support by the Life Cycle Assessment (LCA) service (providing circular and sustainability related KPIs monitoring) or the Refurbishment service (performing a trustworthy tracking of the different parts of the final product in order to ensure that all parts comply with the user requirements).

Image by Gerd Altmann from Pixabay

2. KYKLOS 4.0 **Benefits**

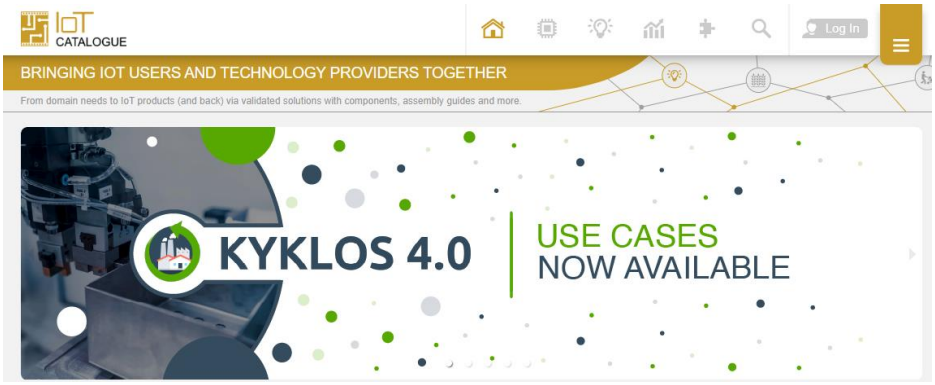
KYKLOS 4.0 delivers an advanced configuration variants' framework and state-of-the-art production paradigm, embedding key technologies into a unified platform Ecosystem to manage live product innovation. Key benefits of the project, as they are formed until this point, are summarized below:

- **Promote** low-cost and easy-to-use tools and data platforms, so that SMEs could adopt Circular Economy principles with limited investments from an ICT platform and Data Space point of view
- **Incorporate** a set of components that support the production, post-production, and assembly phases, by modernizing the functionalities of shop floors in the adoption of Circular Manufacturing principles
- **Identify** processes not performing optimally and recommend further improvement
- **Address** several business-related and technical challenges towards building a Circular Economy
- **Accelerate** businesses' digital transition to boost their advancement and recovery
- **Enable** continuous monitoring of the Circular Manufacturing implementation within the organizations to early react and improve the Circular Economy related metrics.

3. KYKLOS 4.0 **Dissemination and Exploitation**

IoT Catalogue

Eight use cases and 30 components developed within the KYKLOS 4.0 project are now available on the 'IoT Catalogue'.



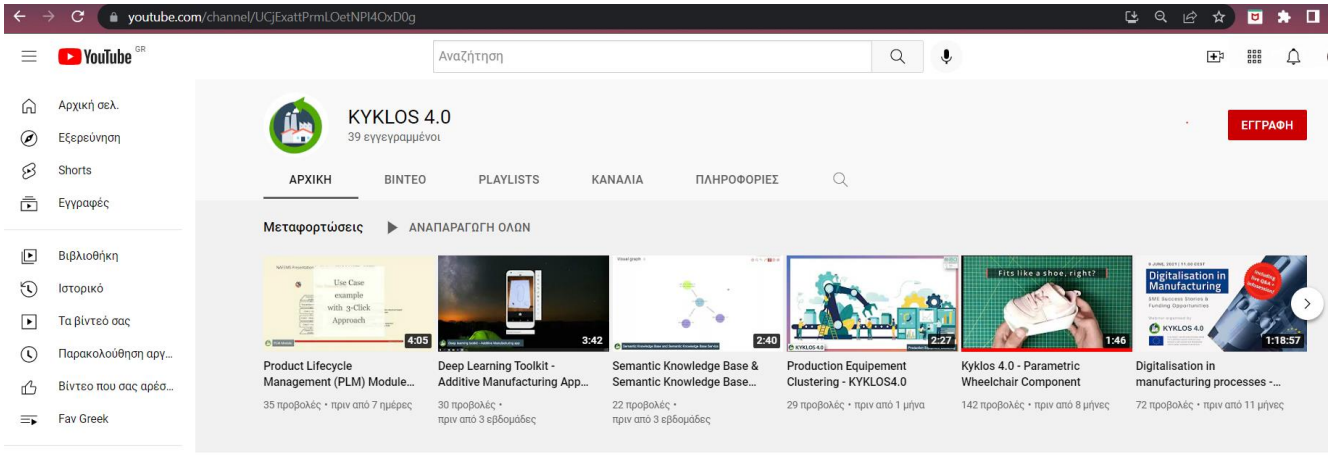
The IoT Catalogue is a one-stop-source for Internet of Things (IoT) knowledge, innovations, and technologies, aiming to help IoT stakeholders (developers, integrators, advisors, end-users, etc.) to take the most advantage of the Internet of Things for the benefit of society, businesses, and individuals.
It is an explorer for innovations in IoT applications and technologies, a web-based tool that enables to pick & choose IoT solutions as well as a wide repository of knowledge, use cases, contacts, etc. of the Internet of Things.

For more visit: https://www.iot-catalogue.com/projects/61eecf88120630002afdfef6

YouTube

Discover more about the KYKLOS 4.0 technical components (TCs) through a series of videos, posted on KYKLOS 4.0 YouTube channel.
Every partner delivered short and comprehensive videos (with a duration of about 1 to 5 minutes) for their TCs explaining the benefits for sustainable and circular manufacturing, including a live demo showing the main capabilities of the TC for sustainable and circular manufacturing. The videos are shared through KYKLOS 4.0 social media channels (LinkedIn, Facebook, Twitter etc.) during the first and second semester of 2022.

For more visit: https://www.youtube.com/channel/UCjExattPrmLOetNPI4OxD0g



KYKLOS 4.0 Augmented Reality Content Editor

5. KYKLOS 4.0 **Open Calls**

The first batch of projects selected through the KYKLOS 4.0 - Open Call #1 funding programme kicked off their activities last November 2021. After an intensive six months, the seven projects have wrapped up their experimental activities at the end of April 2022 with positive results.

The seven projects have put forth and piloted solutions focusing on improving digital manufacturing processes while simultaneously contributing to improving circular manufacturing.

ADME has worked to develop a decision-making support software tool helping to assess the recyclability of materials in Additive Manufacturing processes, based on information provided by the material suppliers and know-how gained by manufacturing with these materials.

BEERco2 has developed a solution that enables 'low carbon' beer production and align the brewing processes with circular economy models, as well as on-demand beer production in accordance with consumer (eco-friendly) preferences.

D4CM has developed, implemented and validated a CPS platform that includes an AI-based machine errors detection and adaptive compensation models relying on deep learning techniques.

DREAM has developed a decision support platform based on data-driven (AI-based) model. This platform will help manufacturers in the assessment of a machine tool's exploitable life for reuse at the e at the end of the first lifetime (EO1L)

EFIM-Food has created a software platform capable of: real-time monitoring of the sobao manufacturing process; understanding energy use and consumption; proposing improvements for a more efficient production; monitoring of KPIs for an LCA.

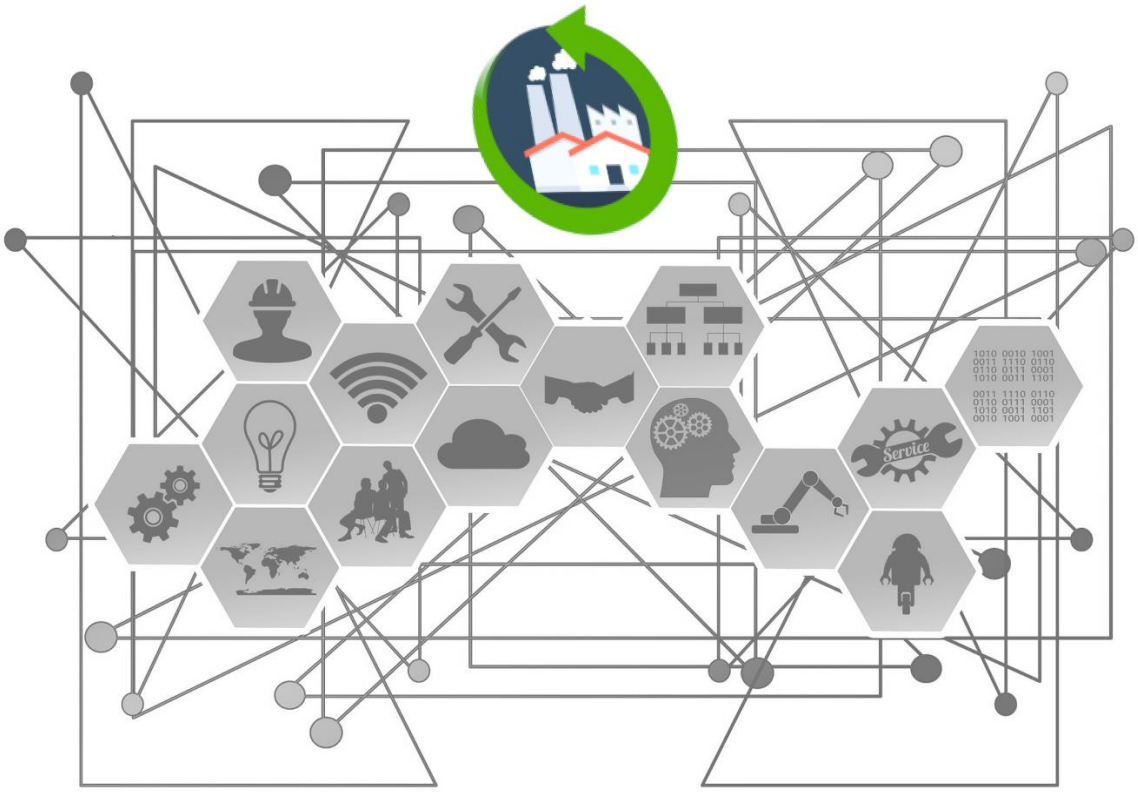
METALICA has developed a configurable and modular Digital Twin for smart pipes; and data-driven, closed-Loop LCA and CBM models for continuous improvement.

PET-Circle has deployed a pilot to validate a small-scale circular value chain (at the GR3N chemical recycling plant for PET waste).

Additional details on the projects and for some key insights provided through individual interviews can be found on the KYKLOS 4.0 website.

With the first round of experiments coming to an end, the second KYKLOS 4.0 project Open Call was launch in July 2022. In this second Open Call, applicants are invited to select a set of services from the KYKLOS 4.0 marketplace and carry out an experiment in a manufacturing environment. The services include several technological components developed within the KYKLOS 4.0 project that contribute to improving the digitalization of manufacturing processes.

The second KYKLOS 4.0 Open Call has more than 2 million EUR to fund a minimum of 14 projects. For more information, please visit KYKLOS 4.0 website.



Download KYKLOS 4.0 presentation, leaflet, and posters

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