KYKLOS 4.0 newsletter #6

KYKLOS 4.0 – https://kyklos40project.eu

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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 2nd round of the **KYKLOS 4.0 Open Calls**. The projects will develop a broad range of digital manufacturing activities using **KYKLOS 4.0 Services and Components** and will run until the end of August 2023.

KYKLOS 4.0 **Services**

Contents

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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The KYKLOS 4.0 Circular Manufacturing Framework incorporates a set of Services and Technical Components (TCs) that support the production phase, including preparation of the production, the production phase itself, post-production and finally, assembly that can help modernizing running shop floors in the adoption of circular manufacturing/economy principles. The extent of each TC's contribution to circularity varies, depending on its functionalities. TCs cover several aspects of the Circular Economy characteristics, enabling factors, categories, and business models, contributing considerably to circular economy, and/or providing significant complementarity in offering circular functionalities and strategies.

The Services provided by the KYKLOS 4.0 Circular Manufacturing Framework combine a set of TCs and are divided into 2 main categories, namely: Smart Design, and Production Optimization. The Services that belong to each category are focused either on the manufacturing design phase or on production, as the correspondent category name indicates. Nevertheless, the Services leverage functionalities related to product lifecycle management in each of the stages of the manufacturing process. Furthermore, the use of KYKLOS 4.0 Services enables the development of new circular and data-driven models to customers, based on the insights provided by each Service.

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KYKLOS 4.0 **Funded Experiments**

Open Call #2

The second round of experiments funded under the KYKLOS 4.0 project are under way. 17 projects, funded under the KYKLOS 4.0 – Open Call #2, started on the 1st of January 2023. The projects will develop a broad range of digital manufacturing activities using KYKLOS 4.0 Services and Components and will run until the end of August 2023. The KYKLOS 4.0 – Open Call #2 was published and launched on 1 April 2021 and closed on the 27th of July 2022.

Submission highlights

The KYKLOS 4.0 - Open Call #2 received 46 proposals involving 138 entities. The country with the highest number of participations in submitted proposals was Italy, with 65 participations, corresponding to approximately 47% of all participations. Furthermore, this corresponds to an Italian entity participating in 34 of the 46 proposals submitted. The second highest participation is Germany, with 27 participations and 9 proposals submitted, followed by Greece with 11 participations and 6 proposals submitted.

Further looking into country participation, particularly by EU Member States, H2020 Associated Countries, and other eligible countries, most of the participation comes from EU Member States (122 of 138), with the remaining participation coming from Albania (2), Norway (1), Serbia (2), Switzerland (1), Tunisia (3), Ukraine (1), and the United Kingdom (3).

Regarding the composition of the consortia that submitted proposals, 21 proposals were submitted by a 2-partner consortium and 25 proposals with a 3-partner consortium (maximum eligible). Furthermore, 38 proposals were submitted involving partners from the same country, while 18 proposals had partners from one or more different countries.

Of the 46 submitted proposals, 17 were invited to the contract preparation phase (37% success rate)

The geographical distribution of the funded sub-granted projects shows that the highest number of participations come from Italy (12) followed by Greece (11) and Spain (6). This open call will also fund entities from France, Poland, Germany, and Belgium.

The 17 sub-granted projects will run for eight months. Each project will receive mentoring and other business services to maximize the commercial potential of their solutions. The projects funded in the open call will receive in total €2,164,188.89.

Sub-granted projects overview

[1] ANATOLIA

Title
AdvaNced tool for predictive mAinTenance Of photovoLtaIc pAnels
Acronym
ANATOLIA
Partners
NEURALIO AI P.C. (Greece), Solarkapital Asset Management Services LP (Greece), IA AGRO P.C. (Greece)
Abstract
ANATOLIA is delivering a predictive maintenance tool consisting of a set of tools under one framework and building upon components of KYKLOS circular economy services. To this end, ANATOLIA aims to facilitate energy efficiency, demonstrable at pilot areas (PV plants) with clear circular economy indicators. Developing ANATOLIA will allow these benefits, and the deployment of anomaly detection systems can help to close the gap between the current situation and the next generation of predictive maintenance systems.

[2] ARACOWELD

Title
Augmented reality for agile collaborative welding
Acronym
ARACOWELD
Partners
Canonical Robots S.L. (Spain), Oxiplant (Spain)
Abstract
Aracoweld will use augmented reality technology to allow features such as contextual or on-the-spot training, real-time operator machine/process monitoring, and simple operator task confirmations and malfunction reporting. In summary, our experiment aims to provide modern capabilities to an automatic welding system to improve the human-machine interaction and contribute to the circular economy.

[3] ARETRO

Title
Augmented Reality to support the maintenance and smart retrofitting of industrial machines
Acronym
ARETRO
Partners
Allbesmart, LDA (Portugal), Dinefer - Engenharia e Sistemas Industriais SA (Portugal), MindSolutions-Industrial Solutions Lda (Portugal)
Abstract
This project will address the validation of circular manufacturing towards experimentation. We will showcase how retrofitting powered by new AR visualisation technologies can support knowledge-intensive production processes, giving a second life to legacy machines, and contributing to the Circular Economy paradigm.

[4] ATILIUS

Title
Additive Technologies for Innovative Low-thrust Iodine space Unit from Scrap
Acronym
ATILIUS
Partners
Technology for Propulsion and Innovation S.p.A. (Italy), Aidro S.r.l. (Italy), Optimad S.r.l. (Italy)
Abstract
ATILIUS is an innovative fluidic system for an electric space propulsion system for CubeSats that will reduce material consumption and waste on Earth and mitigate further pollution in space. It will contribute to finding solutions to open critical points along the AM process chain, while enabling de-orbiting of CubeSat missions.

[5] CE4Con

Title
Circular Economy for Construction industries
Acronym
CE4Con
Partners
R2M Solution S.r.l. (Italy), Focchi S.p.A. (Italy), HOL S.r.l. (Italy)
Abstract
The objective of the CE4Con is to develop a new range of services to support facade manufacturer in the building sector, which will subsequently be extended to all manufacturers of envelope building components, in the design and production of new items with recycled composite material. The services will be validated by a facade manufacturer, to demonstrate that they can be adopted and create impact even on a poorly digitalised sector like construction.

[6] DLP4CME

Title
Auditable Product Lifecycle based on a Trusted Data-driven Decentralized Architecture for Circular Manufacturing Ecosystem
Acronym
DLP4CME
Partners
XYMBOT DIGITAL SOLUTIONS (Spain), FOCKE MELER GLUING SOLUTIONS (Spain)
Abstract
Digital Lifecycle Passport (DLP) technology is designed to provide end-to-end traceability, transparency, and trust of every manufactured product during its life cycle in an edge-based decentralized circular supply chain. DLP allows building secure human-oriented data-driven analytics services on top (ground-to-cloud) trusted data collected from a decentralised secure edge network deployed across the manufacturing supply chain.

[7] DYBLI-ML

Title
MLOps for sustainable Industry 4.0 with Fault Detection Models
Acronym
DYBLI-ML
Partners
Colomba Link GmbH (Switzerland), LABORATOIRES PICHOT (France)
Abstract
The DYBLI-ML project will bring machine learning DevOps (MLOps) to the industrial sector in a user-friendly way by eliminating complexity. The main focus will be localised to fault detection of electric motors for large industrial production lines. Our long-term vision is to create a user-friendly ML dashboard to allow technicians to monitor and predict failures.

[8] EasyPrint

Title
Engine for the Assessment of SYstem PRINTing
Acronym
EasyPrint
Partners
SAUTECH srl (Italy), MEDAARCH (Italy), ENCO srl (Italy)
Abstract
EasyPrint provides an effortless smart design service to develop personalised products following an environmentally friendly process. Helping customers to provide the specific requirements for a customisation and mass customisation product, the platform allows 3D printing manufacturers to convert the requirements defined by the customer into individualised product specifications and to complete a customer-oriented design for additive manufacturing products.

[9] ERMES

Title
Enhancement of equipment maintenance seRvice through seemless integration of sMart schEduling and proceSs mining
Acronym
ERMES
Partners
AXIRO Italia Srl (Italy), UTENSILERIA VALTELLINESE Srl (Italy)
Abstract
The ERMES project will enhance and optimise maintenance service of production equipment/machine tools through seamless integration of AI-powered process mining techniques and smart scheduling. The goal is finding "touchless" process paths that require minimal costs, resources and time allowing businesses to increase speed and accuracy, allowing teams to focus on doing what they do best as efficiently as possible.

[10] MaChAwAI

Title
Material Characterization Augmented with Artificial Intelligence
Acronym
MaChAwAI
Partners
MaCh3D Srl (Italy), RedLynx Robotics Srl (Italy), 3DPR Srl (Italy)
Abstract
The project MaChAwAI aims to develop an improved material testing procedure, augmented with artificial intelligence, and integrated with the testing machine MaCh3D, a miniaturised universal tensile testing instrument. By implementing material testing directly in the industrial production areas of 3DPR, a production company specialised in additive manufacturing, will find it easier and faster to control the quality and mechanical characteristics of the material being processed, with a positive impact on the life cycle and duration of the final products.

[11] MainSol

Title
Holistic predictive maintenance of solar power systems for sustainable manufacturing
Acronym
MainSol
Partners
PHOENIX (Serbia), DESIGN (Serbia)
Abstract
MainSol's vision is to create a new generation of the predictive maintenance solutions for middle-sized solar power plants which use the advanced AI and data analytics methods for predicting/analysing not only the trends in generated solar energy, but also the status of the entire solar and manufacturing infrastructure enabling a holistic predictive maintenance.

[12] POET4POEM

Title
Product-Oriented Energy and resources Tracking for Production Optimization and Equipment Maintenance
Acronym
POET4POEM
Partners
MASTA SOLUTIONS Sp. z o. o. (Poland), MCH POLSKA IWONA KOSCIUSZKO (Poland), MICHAŁ JANIEC MJ POLYMERS (Poland)
Abstract
The POET4POEM project addresses two main challenges of the circularity in high-mix, low-volume manufacturing – optimisation of the energy consumption in individual production steps as well as tracking and reusing the generated scrap. Embracing such a circular approach will help the manufacturing companies in reducing the environmental footprint of their operation while also offering economic benefits.

[13] PUMP

Title
Predictive Upcycling Maintenance Platform
Acronym
PUMP
Partners
VRUMP Industrial IoT Solutions (Greece), PLEGMA LABS S.A. (Greece), HELIOS BAKERY (P&E TAKOUDIS - PSKAFIDAS O.E.) (Greece)
Abstract
The PUMP project will apply existing non-intrusive energy monitoring tools and advanced ML models to analyse the patterns in electrical loads of machinery equipment, disaggregate component loads, and detect deviations from normal operation in a food processing plant. PUMP will utilise various KYKLOS 4.0 services and features and enhance already developed tools to tackle the problem by combining the outputs of these tools with the DSS system of KYKLOS 4.0.

[14] RoboWeldAR

Title
Cognitive robotic welding solution for Shipbuilding 2.0
Acronym
RoboWeldAR
Partners
IKnowHow SA (Greece), Carell SA (Greece), KiNNO Consultants (Greece)
Abstract
RoboWeldAR is an innovative, self-navigating robotic welding solution that will revolutionize the ship newbuilding and repair industry (Shipbuilding 2.0). RoboWeldAR is designed to bridge the gap between the human-operators and robot-machines; also enabling those who are not familiar with the technology and process, towards modernizing laborious, dangerous jobs, while raising the efficiency and competitiveness of the shipbuilding and repair industry through the economic, social, environmental benefits the solution creates.

[15] ROCTex

Title
Resource Optimization for Circular textile product production processes
Acronym
ROCTex
Partners
Zelus PC (Greece), ZeroBelow (Germany), SUPERSTILE LTD (Italy)
Abstract
ROCTex' goal is the development of a digital solution which enables textile producers to accelerate the adoption of technological innovation in order to increase their energy efficiency and their agility, to reduce their waste during the product design and production processes, and to allow the building or enriching of digital product passports that will help researchers come up with innovative solutions for making the textile manufacturing circular. This solution would come at a perfect timing for companies who are currently being prepared (and forced) to address the requirements of the EU Strategy for sustainable and circular textiles.

[16] SMARTER-MAN

Title
A disruptive digital solution for SMARTER MANufacturing of technical textiles with enhanced resource optimization
Acronym
SMARTER-MAN
Partners
APM Comercial Informàtica S.A. (Spain), LA INDUSTRIAL ALGODONERA, S.A. (Spain)
Abstract
The SMARTER-MAN project will increase the efficiency of the manufacturing of elastic cords targeted to the agro-textile sector – aimed to hold and protect fruits trees and crops from adverse climate conditions. Such array of benefits include reduced machine downtime with improved asset utilization, less waste generated and lower manufacturing labor costs, and ultimately an improved product quality leading to greater customer satisfaction and increased profits.

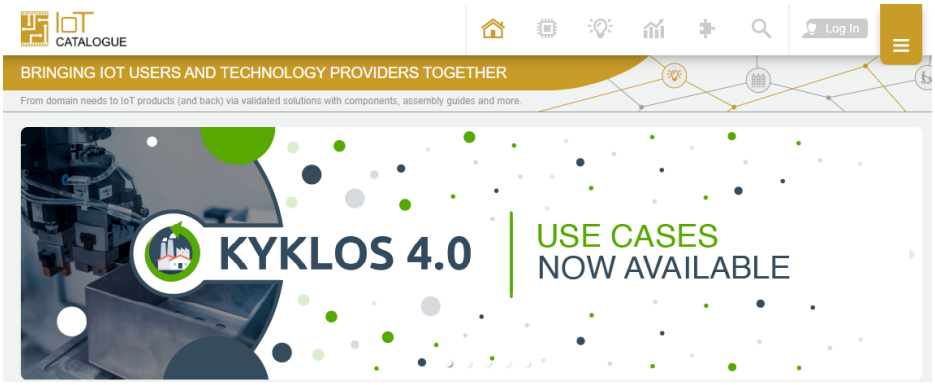
[17] VirtFuse

Title
Smart circular-compliant Vacuum infusion in Industry 4.0: Mixed cloud-edge digital twin model of vacuum infusion in next generation of manufacturing companies
Acronym
VirtFuse
Partners
iThermAI B.V. (Belgium), Trygons SA (Greece)
Abstract
VirtFuse is a digital twin model of vacuum infusion equipment. VirtFuse employs measurements generated by temperature sensors, resin curing sensor, as well as RGBT (RGB+Thermal) video cameras which monitor the infusion process in real-time. The model is trained using an AI-based bootstrap learning approach to minimise the dataset generation auditing phase.

KYKLOS 4.0 **Dissemination and Exploitation**

IoT Catalogue

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



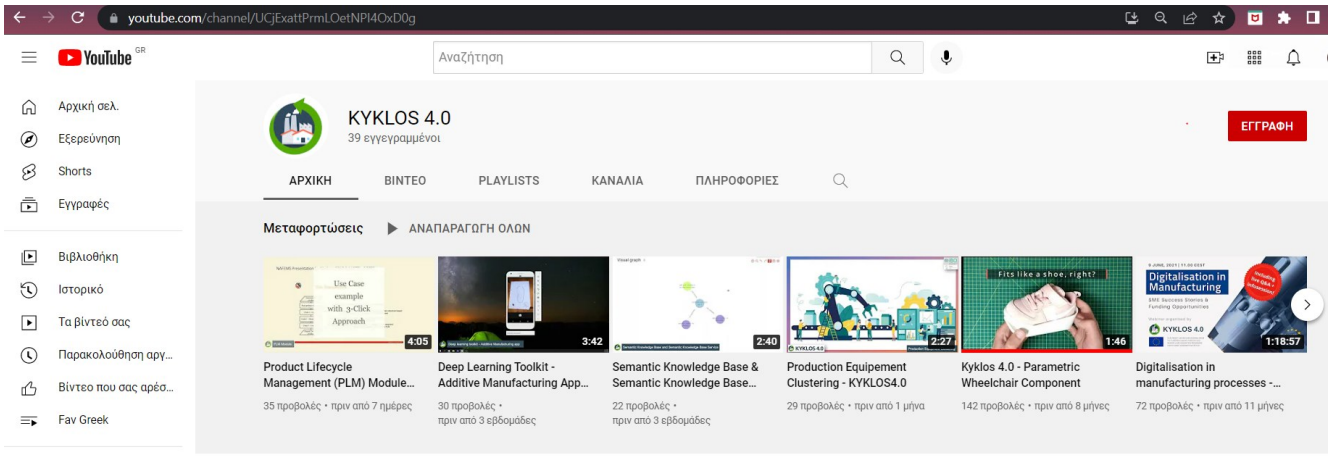
The IoT Catalogue is a one-stop-source for Internet of Things (IoT) knowledge, innovations, and technologies, aiming to help IoT stakeholders (developers, integrators, advisors, end-users, etc.) to take the most advantage of the Internet of Things for the benefit of society, businesses, and individuals.
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 information visit: https://www.iot-catalogue.com/projects/61eecf88120630002afdfef6

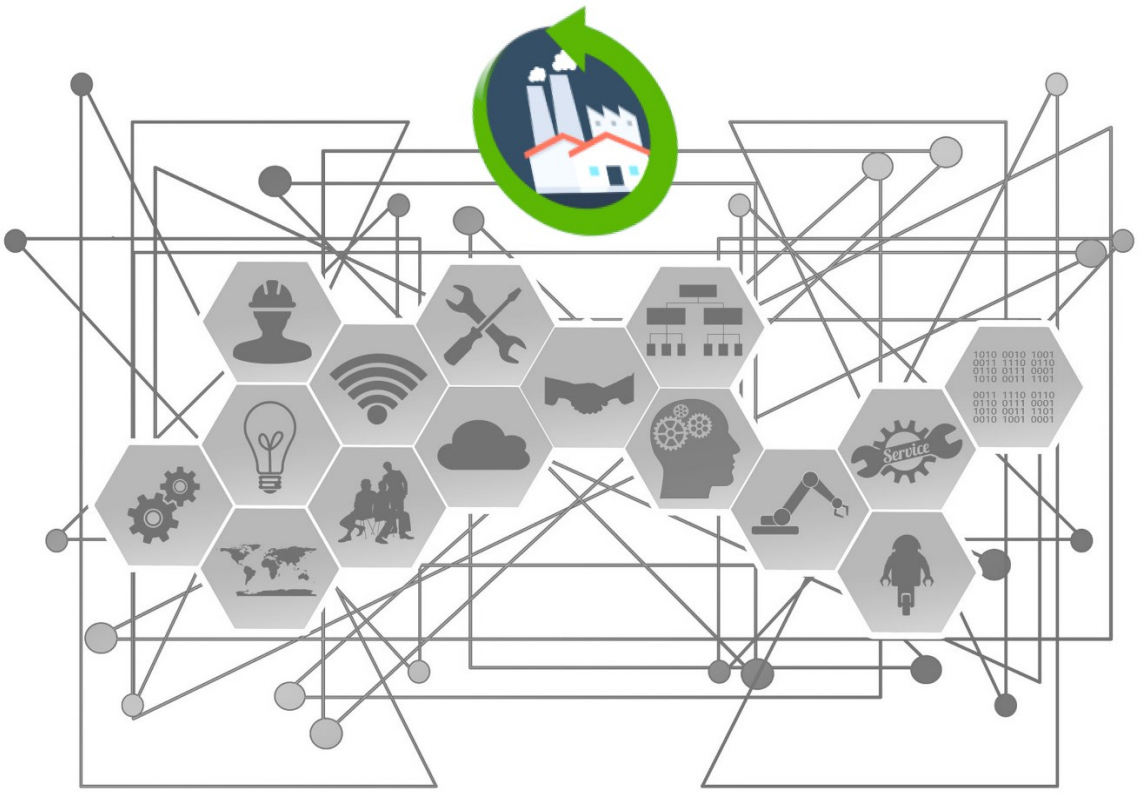
YouTube

Discover more about the KYKLOS 4.0 TCs through a series of videos, posted on the 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.

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



KYKLOS 4.0 Augmented Reality Content Editor



Download KYKLOS 4.0 presentation, leaflet, and posters

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