Welcome to the Third DOME 4.0 Newsletter!

DOME 4.0

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We are pleased to announce the publication of the third issue of the DOME 4.0 newsletter. If you are interested in industrial data and digital marketplaces, you are at the right place!

DOME 4.0 is a 4-year Research and Innovation Action (RIA) from 2020 to 2024 funded under Horizon 2020 focusing on developing a comprehensive industrial data ecosystem aligned with the Open Science and Open Innovation objectives to enable sharing of business-to-business (B2B) data for the purpose of value generation and creation of new or enhanced products, processes, and services.

DOME 4.0 will be open to all providers and users of data, and aims to facilitate maximum knowledge extraction with the help of ontology-driven semantic data interoperability and modern data processing technologies adopted from the fields of Machine Learning (ML) and Artificial Intelligence (AI). These features are crucial to scale and advance the proposed ecosystem to any sector of the economy. Given the significant contribution of the materials and manufacturing sectors to the European economy, DOME 4.0 focuses on data-driven knowledge generation within these key sectors.

STAY TUNED

Stay updated on all our latest news, developments, research and general information regarding the DOME 4.0 project.

PROJECT INFORMATION

Digital Open Marketplace Ecosystem (DOME) 4.0
Grant Agreement ID: **953163**
Start Date: **December 1st, 2020**
End Date: **November 30th, 2024**
Coordinator: **COMPUTATIONAL MODELLING CAMBRIDGE LIMITED (CMCL)**

DOME 4.0: Industrial Engagement Open Day and Hackathons

The DOME 4.0 project co-organized in partnership with the **SimDOME** Project a hybrid event, at **BI-REX** premises consisting of a single-day Industrial Engagement Open Day (IEOD) and a two-day Hackathon held between 17-19 January 2023 in Bologna, Italy.

The event covered a wide range of topics such as data sharing, taxonomies, Ontologies, standardisation and Industry Commons, as well as platforms and use cases covering materials, manufacturing, environment and maritime sectors.

The DOME 4.0 partners, **CMCL, NETCOMPANY-INTRASOFT, University of Bologna**, were involved in the planning and organization of the event. Over 70 participants attended the three-day event from various industries, academia, and research. During the event took place interesting talks and panel discussions which delivered by project partners, including **SISW, BOSCH**, and **CMCL**.

Visit our website: **www.dome40.eu**

DOME 4.0
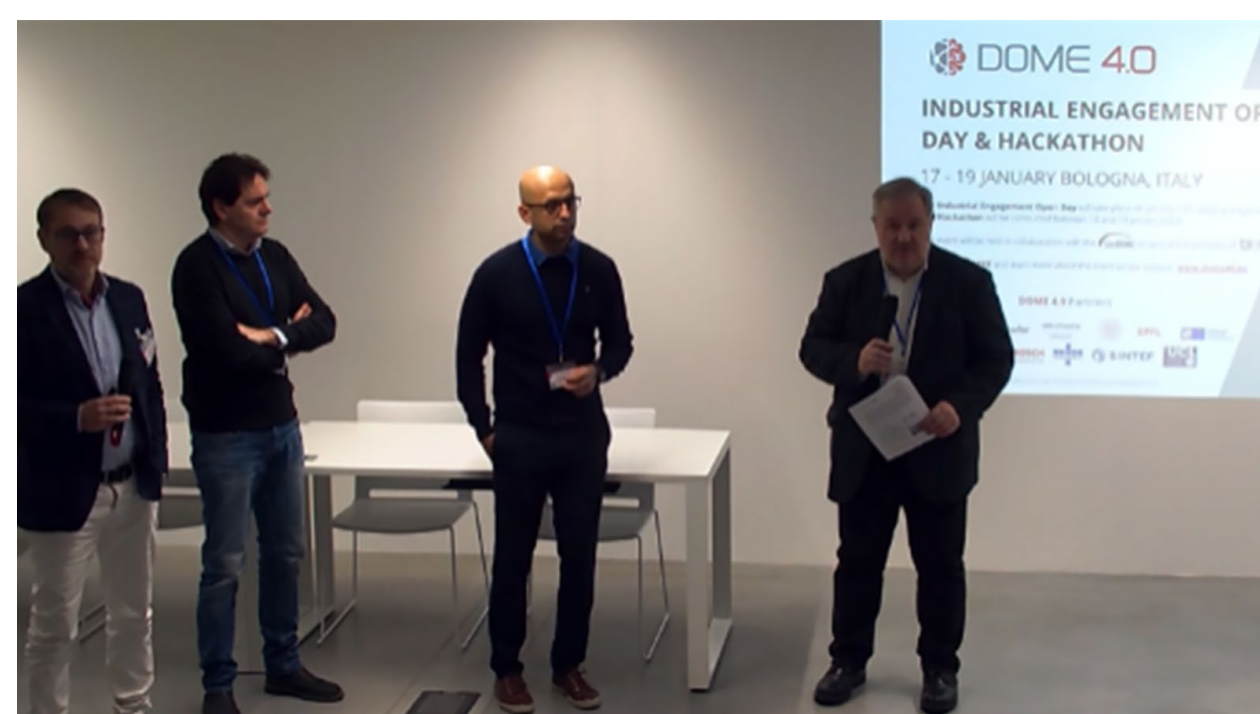# Industrial Engagement Open Day

We are pleased to announce the recent success of the DOME 4.0 Industrial Engagement Open Day (IEOD), which took place in partnership with the **SimDOME** and how to develop compatibility between proposed data management solutions with already existing data management practices in the industry as well as the novel Business Models.

The aim was to actively engage industrial partners and established corporate networks within and outside of the consortium in supporting further development of proposed solutions by providing ideas, guidance, technical recommendations and exploitation optimal strategies to ensure future compatibility with data management handling and practices within different organizations.

The IEOD aimed to identify gaps that the industry has in the field of data handling and data manage-

ment practices and use them as an input for the Hackathon. DOME 4.0 two days Hackathon on 18th and 19th January 2023 followed the IEOD and aimed to provide an important pathway to increasing the scalability of the DOME 4.0 ecosystem and focus on rapid development aimed at solving problems and proposing new solutions via demonstration.

DOME 4.0
Industrial Engagement Open Day

The IEOD was led by **Cambridge Nanomaterials Technology Ltd (CNT)**. The DOME 4.0 partners, **CMCL, NETCOMPANY-INTRASOFT, University of Bologna**, were involved in the planning and organisation of the event which was held at **BI-REX**, in Bologna, Italy.

Speaker for the event came from leading industrial organizations such as: **Bosch Center for Artificial Intelligence** (BCAI), **Siemens PLM Software** (SISW) and **Umicore**. A total of 74 people

registered to participate on the IEOD, with the majority attending in person. An exhibition was organized for the in-person participants by the hosts, BI-REX National Competence Center - Big Data Research and Innovation Excellence. The exhibitors were: Caboto, Nextema, Cell Dynamics, Nireos, Data River, Astreo, and Energy Group.

Dr Bojan Boskovic from CNT was responsible for moderating and coordinating the IEOD, chairing the presentations, discussions, and facilitating interactions between external participants and project partners.

The event was attended by participants from various organizations such as: Airbus, ESRF, HaDEA, UKRI, Goldbeck Consulting, Fraunhofer, NETCOMPANY-INTRASOFT, SINTEF, UCL, AIM, Astreo, Cell-Dynamics, DataRiver Srl, Energy Group, NIREOS, UMICORE, Rekeep, C Quadra, Caboto, Var Group, Yiotis, Youbiquo, Politecnico di Torino, University of Bologna, MEP, National Technical University of Athens, and Nextema, among others.

DOME 4.0: Hackathon

The DOME 4.0 project partners recently held a successful hybrid event at bi-rex facilities in Bologna, Italy, as part of their efforts to disseminate and transfer project advancements to the general public. The theme of the event was dedicated on ontologies and standard vocabularies for data sharing. DOME 4.0 partners have planned three major Hackathon events, accompanied by Industrial Engagement Open Days and Industry Commons Ecosystem (ICE) Lab.

During the event, project partners were involved in delivering material for the event, ranging from industrial partners to showcase owners and platform developers. Also, partners from Industry Commons sister project OntoCommons also contributed to the event. Furthermore, a dedicated session in the Hackathons were dedicated to Horizon 2020 project SimDOME, to cover relevant advancement achieved in their project.

An exhibition was planned as a part of the day, giving the start-ups and small companies to showcase their work and pitch their ideas to the participants.

DOME 4.0: Hackathon

The Hackathon was planned as four different sessions:

- **Session 1:** Vocabularies, Taxonomies and Serialisation
- **Session 2:** Top Level Ontologies, Mid-Level Ontologies, and Industry Commons
- **Session 3:** SimDOME – Materials and Manufacturing
- **Session 4:** Data Sharing and Ontologies

In each session, training material presentations and talks covering ontology development, standard vocabularies, alignment with the standardisation and documentation guidelines, data FAIRness and data sharing experiences, along with practical user cases from DOME 4.0 showcases were delivered to the participants, and an interactive session followed to engage them in a more hands-on experience in developing tools and services to enable data sharing.

Over 70 participants spanning from industries, Academia, RTOs and independent researchers participated in the event. Feedback received from the partners and participants were very positive, indicating the success of the event. We hope this event has been useful for the participant and look forward to engage with a wider range of participants in next two events.

Follow the DOME 4.0 project for more news and updates!

DOME 4.0

SHOWCASE:
Chemistry Knowledge Graph - Marine, Air Quality And Nanoparticles

This showcase provides a consistent framework to store, access, and interpret vastly growing chemical data, marine emissions data, location data, and air quality data in an intelligent manner. With this project, we aim to establish semantic interoperability between a variety of data sources such as ship location/positioning databases, marine nanoparticle emissions software, air quality-dispersion modeling software, and data-based surrogate model generation software.

To achieve this interoperability across multiple domains, CMCL will employ and extend its existing ontologies (Ontokin), its detailed (mesoscopic and continuum) emissions prediction software, kinetics, and its data-based model development toolkit, MoDS. We will also develop web-based software agents to work on the data from multiple sources.

Our project will focus on developing automated services that can identify the best quantum chemistry data from existing marketplaces or databases to feed the thermodynamic quantities for gas phase species that are used in emissions prediction models. The dispersion models will utilize this information to provide localized air quality measures, particularly the particulates in terms of mass and number concentration. We will track the following metrics throughout the course of our 4-year project:

1. The integrated MoDS-kinetics software and CMCL's chemistry KG can offer a new product for predicting regional air quality.
2. Using the temporal KG, improved decision making for the development of new marine powertrains will be assessed.
3. Data transactions from multiple sources via DOME 4.0 will be leveraged to reduce development costs of marine manufacturing technologies.
4. Applicability of the developed infrastructure to nanoparticles manufacturing (carbon black, silicon, zinc oxide, etc.).

We are excited to embark on this journey, and we believe that our project will be a significant step forward in improving our understanding of chemical data, marine emissions data, location data, and air quality data. We will keep you updated on our progress as we continue to work towards building a smarter, more connected future.

News

Step 1: Search for material   Step 2: Get info for material   Step 3: Hand data off to AiiDALab

AiiDALab Platform Is Avaliable on DOME 4.0 Project

AiiDAlab is a web platform that enables computational scientists to package scientific workflows and computational environments into "apps" and to share those apps with their collaborators and peers.

Read more

DOME 4.0 Organized An Industrial Engagement Open Day And Hackathons

The DOME 4.0 project co-organized in partnership with the SimDOME Project a hybrid event, at BI-REX premises consisting of a single-day Industrial Engagement Open Day (IEOD) and a two-day Hackathon.

Read more

DOME 4.0 Industrial Engagement Open Day and Hackathon

DOME 4.0 project organizes a public event comprising an Industry Open Day along with the first Hackathon.

Read more

News

DOME 4.0 Organize the Industrial Engagement Open Day and Hackathon

DOME 4.0 Industrial Engagement Open Day offers an opportunity to engage with some of the leading practitioners from industrial R&D while exploring the novel business models being investigated in the DOME 4.0 project.

Read more

The 5th GA Meeting of DOME 4.0 Project And The Joint Event With The OntoCommons

The 5th GA Meeting of the DOME 4.0 project was held in a hybrid mode between 29 – 30 November 2022 in Galway, Ireland.

Read more

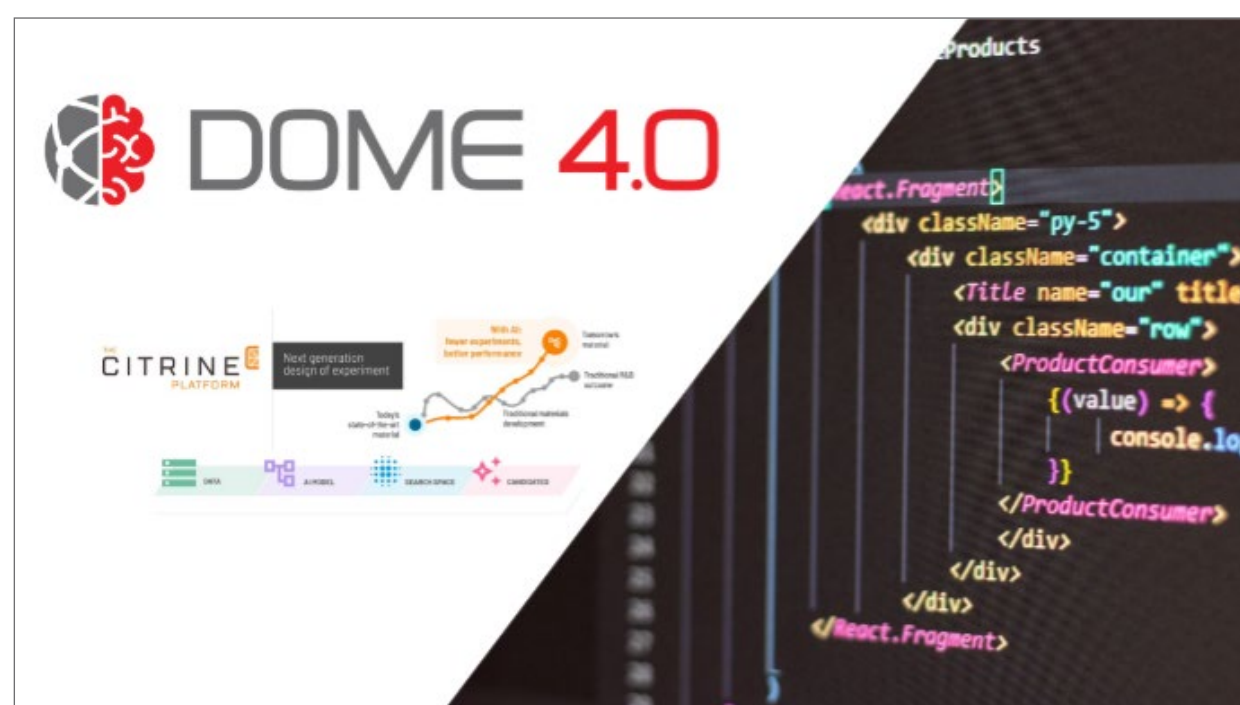## DOME 4.0 At the OntoCommons Demonstrators & Use Case Workshop

DOME 4.0 project has been invited to be presented at the "OntoCommons Demonstrators & Use Case Workshop – Demonstrate the Power of Standardisation".

Read more

News

New Research Work Based On The Dome 4.0 Project

DOME 4.0 conducted a new research on how materials informatics accelerates customer-tailored composite material design.

Read more

DOME 4.0: 1st Review Meeting

The 1st review meeting of the DOME 4.0 project was held in a hybrid format at the premises of the NETCOMPANY-INTRASOFT in Brussels, Belgium.

Read more

The 2nd DOME 4.0 Newsletter Is Now Available

The second issue of the DOME 4.0 Newsletter is now available.

Read more

News

DOME 4.0 At the IDMT Workshop

The coordinator of the DOME 4.0, Dr. Amit Bhave was invited to talk at the "Hardware & Software for Digital Labs" workshop..

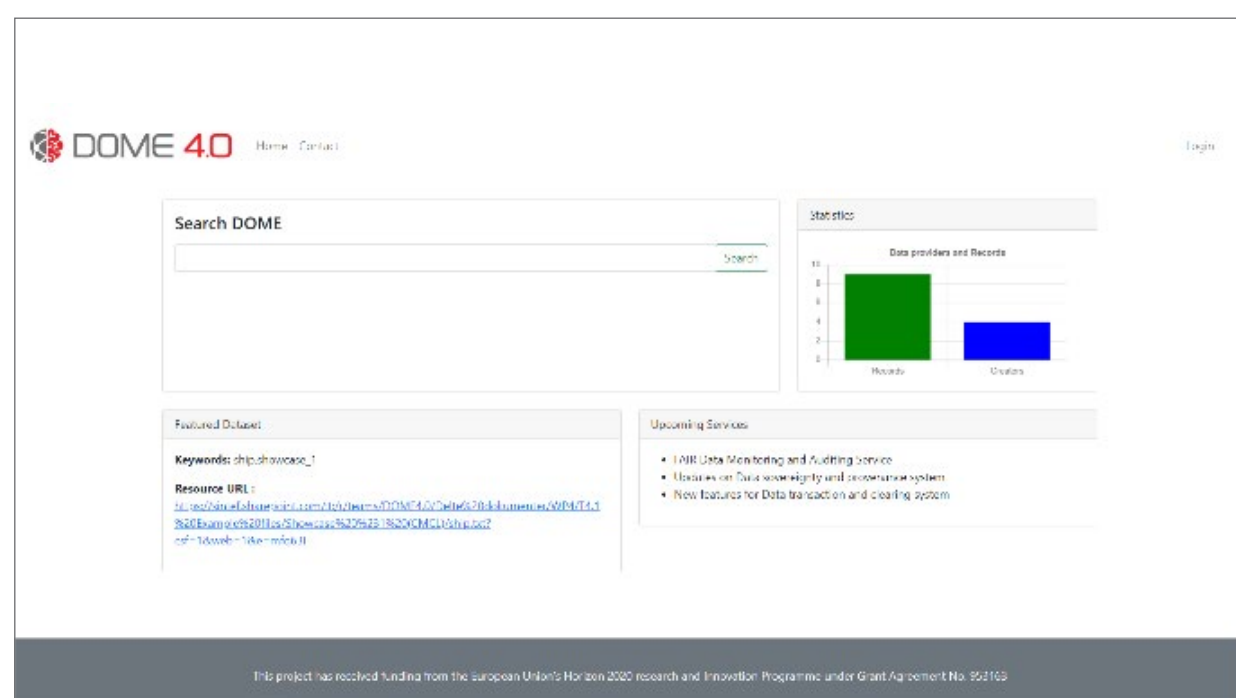**Read more**

DOME 4.0 On SemIIM Workshop

Under the "European Semantic Web Conference" (ESWC 2022) was held in a hybrid mode the "SemIIM 2022" Workshop on May 30th in Heraklion, Crete.

Read more

DOME 4.0: 1st Platform Demonstration

The demonstration of the first version of the DOME 4.0 (Digital Open Marketplace Ecosystem) platform is already released.

Read more

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Events

DOME 4.0 at European and International events – the highlights

DOME 4.0 At The US TechConnect 2022

The DOME 4.0 project was presented at the TechConnect and Smart City Connect Expo, held in Washington, DC (US) on 27-29 September 2022.

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Events

DOME 4.0 On MRE 2022 Event

DOME 4.0 shared its findings in enabling data interoperability and data sharing at the Materials Research Exchange (MRE) 2022 event.

Read more

DOME 4.0 On US TechConnect Event

The DOME 4.0 disseminated some of the results and learnings from in semantics, interoperability, and data sharing in this year's US TechConnect event.

Read more

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