DOME 4.0

Deliverable D5.4 - "Progress report of the interactions with other relevant initiatives v2"

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Dissemination Level:	Public	
Due Date:	M36 (November, 2023)	

Project Profile

Programme	**Horizon 2020**
Call	**H2020-NMBP-TO-IND-2020-twostage**
Topic	**DT-NMBP-40-2020** **Creating an open marketplace for industrial data (RIA)**
Project number	**953163**
Acronym	**DOME 4.0**
Title	**Digital Open Marketplace Ecosystem 4.0**
Start Date	**December 1st, 2020**
Duration	**48 months**

This document is part of a project that has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 953163. It is the property of the DOME 4.0 consortium and do not necessarily reflect the views of the European Commission.

Document History

Version	Date	Author	Remarks
V0.1	03-01-2023	Welchy Leite Cavalcanti	First draft from D5.3 v1
V0.2	20-09-2023	Welchy Leite Cavalcanti	Updates regarding ongoing cooperation activities
V0.3	18-11-2023	Peter Schiffels	Second draft
V0.4	25-11-2023	Peter Schiffels	Update template, add Hackathon events, add reference to OntoCommons
V0.5	29-11-2023	Bijan Yadollahi (CMCL)	Review and Edits
V0.6	30-11-2023	Peter Schiffels	Final edits

Publishable Summary

The DOME 4.0 project covers a wide range of activities and requires cooperation with relevant other national and international initiatives. These cooperation efforts include technical discussions, shared dissemination activities, as well as sustainability and business model discussions in order to maximise the mutual benefit of cooperation with other projects and initiatives. The partners were targeting cooperation actions on events, such as workshops, conferences, etc. in the frame of the EMMC ABSL and other initiatives.

The EMMC ASBL non-profit association (European Materials Modelling Council/https://emmc.eu/) originating from the 2014 EMMC CSA project, is a crucial entity to align developments and to support cooperation with the aim to disseminate project results. DOME 4.0 is in active cooperation with the several projects under the EMMC umbrella. Within the EMMC umbrella projects, a very active channel for cooperation wase established among DOME 4.0 and the OIP projects approved under the call DT-NMBP-11-2020 - Open Innovation Platform for Materials Modelling (RIA) – e.g., OpenModel (GA 953167). Also extremely relevant is the collaboration with the OntoCommons project (GA 958371 / approved under the call NMBP-39-2020).

Executive Summary

The current deliverable - **D5.4: Progress report of the interactions with other relevant initiatives v2** – adds the outcomes of recent activities in the frame of Task 5.3 to the previous report D5.3, v1. The deliverable thus complements the progress of these interactions with other relevant initiatives and associations in cooperation with DOME 4.0. D5.4 mainly covers the work performed in Task 5.3 (Interactions with Relevant Initiatives and Associations) from M1 to M36, while the previous report covered the activities from M1 to M24.

The DOME 4.0 project covers a wide range of activities, and requires cooperation with relevant other national and international initiatives. The cooperation efforts include technical discussions, shared dissemination activities, sustainability, and business model discussions in order to maximise the mutual benefit of cooperation with other projects and initiatives. DOME 4.0 is in active cooperation with the projects under the EMMC umbrella and a dedicated section lists the project partner and respective cooperation. Within the EMMC umbrella projects, a very active channel for cooperation established is among DOME 4.0 and the OIP projects (projects approved under the call DT-NMBP-11-2020 - Open Innovation Platform for Materials Modelling (RIA), e.g., OpenModel (GA 953167). Also extremely relevant is the collaboration with the OntoCommons project (GA 958371 / approved under the call NMBP-39-2020-CSA) and it is shortly presented within this report.

Also extremely relevant is the collaboration with the OntoCommons project (GA 958371 / approved under the call NMBP-39-2020. Special attention has been paid to laying out appropriate task and plans for frequent and regular communication with that project, which will be summarized in deliverable D5.2 (lead BOSCH, due M36).

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1. Introduction

Work package 5 (WP5) focuses on cooperation and community-building within Industry Commons to ensure connectivity with all related and relevant EU-funded initiatives, as well as contributions to standardization and best practice definition. The main objectives of WP5, according to DOME 4.0 Grant Agreement (GA 953163) are:

I. Ensure unified standardisation and optimal cooperation between the DOME 4.0 project and other initiatives and industry commons based on open schemes, market needs and fair conditions.

II. Structure and execute the cooperation with OntoCommons (NMBP-39-2020-CSA) to ensure regular alignment and common language in ontologies and standardisation, previewed in the Task 5.2.

III. Support accelerating data-driven innovation of DOME 4.0 industrial sectors by adapting to emerging and existing developments of industry Commons and other relevant initiatives as well as to permit DOME 4.0 data to be shared and re-used.

IV. Determine and adopt standardized data documentation and open semantic specification.

In this **Deliverable (D5.4 – Progress of the interactions with other relevant initiatives, v2)**, the main focus is to amend the previous report D5.3, v1 with the description of further activities within T5.3 in the period M24 to M36 and thus capture the progress of collaboration and interactions with other active and relevant data platform initiatives and associations in the reporting period M1 to M36. As the lead in task 5.3, the partner Fraunhofer is responsible for describing these advances in cooperation by aligning the objectives with the DOME 4.0 partners.

Moreover, the activities in frame of WP5 particularly task 5.3 here described, are in alignment with WP6 (Dissemination, Communication and Liaison) actions and plans as described within the framework of the task 6.2 (Dissemination within Partner Networks, Industrial End-Users, and Standardisation Bodies). This synergy among WP5 and WP6 helps to promote the adoption of DOME 4.0 developments to create a solid and reputed DOME 4.0 Ecosystem, turning DOME 4.0 into a multi-sided marketplace with the position of being the “marketplace of the marketplaces”. WP5 uses all the dissemination channels prepared by WP6 (see D6. 2) such as:

- Project brand identity (e.g., visual identity, logos, templates, EU emblem)
- Dissemination (e.g., participation and organisation of events, publications, collaboration with other projects, trainings)
- Communication (e.g., digital channels, promotional material)

2. Cooperation in DOME 4.0

Participation in events such as conferences, workshops, fairs, and other related activities broadens and strengthens the network of relevant parties interested in becoming target audiences and intermediaries, and thus becoming DOME 4.0 multipliers. As a result, the project consortium actively participates in EC activities related to data and digital marketplaces organised at the programme level.

The Industry Commons Manager - ICM (BOSCH, Evgeny Kharlamov) ensures effective partnership with the OntoCommons project, NMBP-39-2020-CSA and the cooperation activities with Industry Commons by participating in collaboration events to disseminate the results of the DOME 4.0 project. Engagement with external parties will also be strengthened through the External Advisory Board (EAB).

2.1 Cooperation and Scalability Objectives

To achieve scalability via cooperation, DOME 4.0 engages with European Commission (EC) supported initiatives and collaboration instruments throughout the course of the project and beyond. These integration and cooperation activities of DOME 4.0, as depicted in *Figure 1*, offer a balanced approach for scalability and sustainability by:

- Consolidating the existing marketplaces into knowledge assets;
- Adopting ontology-based data structures, as established in the OSP projects to avert the semantic pitfalls;
- Achieving scalability through connectivity and cross-domain interoperability, while managing data provenance and security;
- Equipping the proposed approach with data analytics, querying, reasoning and inference attributes of AI as, deployed in OTEs and BDSS projects;
- Ensuring consistency, data and software interoperability by embracing standardised data documentation;
- Adopting FAIR data principles in cooperation with International Data Spaces (IDS) and the Research Data Alliance (RDA)

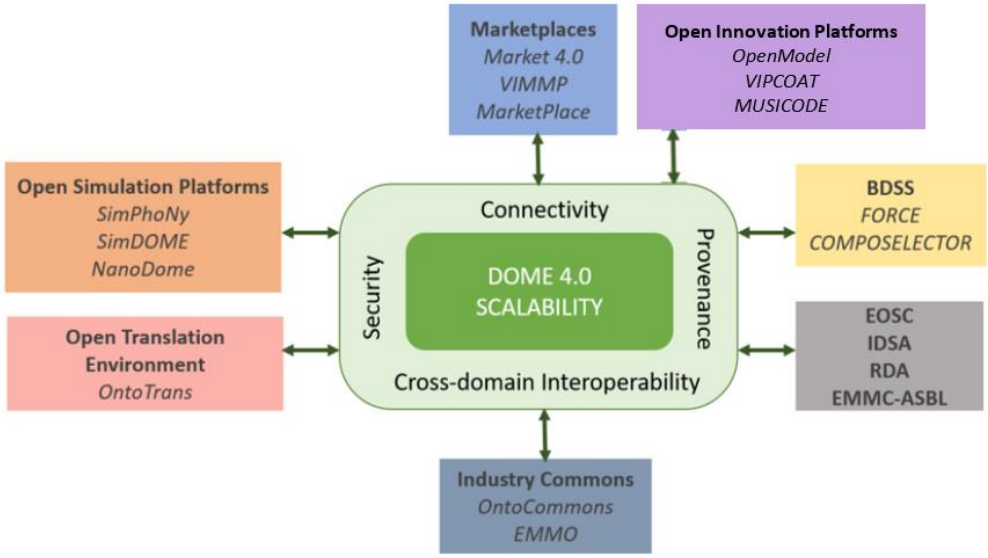

Figure 1: Integration and cooperation activities of DOME 4.0. Adapted from DOME 4.0 Grant Agreement to include the cooperation with OIP projects.

2.2 Progress of cooperation with relevant initiatives

DOME 4.0 partners planned actions for cooperation with similar data platforms, such as DT-NMBP-20-2018 and ICT-13-2018-2019, that can operate on the agreed ontology. The active participation in the European Commission (EC), as already mentioned, is the main objective to gain scalability through collaboration, by supporting initiatives and collaboration instruments. In the deliverable **D5.1 "Coordination of Cooperation Report"**, due M12, it is described in detail the activities planned and undertaken to coordinate all cooperation activities within DOME 4.0 involving relevant external initiatives.

The next subsections will focus on describing the progress on the collaboration actions developed until the period of this deliverable (M36).

2.2.1 NMBP-39-2020-CSA (OntoCommons / GA 958371)

OntoCommons (GA 958371) is a special case within all the projects that DOME 4.0 intends to cooperate with, as it is both naturally very close to DOME 4.0 and is also required in the call for action to have a clear cooperation between that initiative and DOME 4.0. In summary, the activities planned so far include:

- Contributions to standardisation through technical discussions on ontologies.
- Dissemination activities, including multiple presentations by DOME 4.0 at events hosted or co-organized by the OntoCommons project.
- Discussions between relevant partners on both sides about sustainability, exploitation, and business models.
- Increasing alignment with OntoCommons is one of the primary goals of all of the preceding activities.

Related to the OntoCommons it can be shortly cited the following actions and cooperation topics to be detailed within the D5.2 (due M36):

- Semantic data exchange ontology (detailed within the D3.1)
- Joint publication on Bosh standardized welding ontology
    - Preliminary version for the ESWC 22 (Extended Semantic Web Conference/ https://sites.google.com/view/semiim-2022/home) and Advanced for J. of Web Semantics
    - Nov 7-8 a joint workshop organized by BOSCH (https://ontocommons.eu/news-events/events/ontocommons-demonstrators-and-use-case-workshop); results will be updated in the D5.2.
- Sequence of preparation workshops are planed
- Bosch showcase as an example of OntoCommons-DOME 4.0 Cooperation

Details about this collaboration are presented in the deliverable D5.2 - Cooperation Report with NMBP-39-2020.

2.2.2 Cooperation with OIP Projects

Several of the DOME 4.0 partners are coordinators or partners in other related H2020 projects. For instance Fraunhofer partners coordinate OpenModel (GA 953167), Open Innovation Platform project – OIP), Marketplace (GA 760173) and VIMMP (GA760907).

DOME 4.0 leverages these contacts and attempts to build on them in order to collaborate with these initiatives under the broader umbrella of industry commons. Such collaborations can take many forms, ranging from direct technical discussions between development partners to planning joint dissemination activities, events, and so on.

In this regard, the DOME 4.0 project already started the cooperation with OIP projects in M1 by taking part in workshops of Open Innovation Platforms (OIPs) projects. **These activities were continued and intensified in the current reporting period from M24 to M36.** The OIP projects (H2020 projects approved under the same call (DT-NMBP-11-2020 - Open Innovation Platform for Materials Modelling (RIA))) are specifically:

- OpenModel "*OpenModel Integrated Open Access Materials Modelling Innovation Platform for Europe*" (https://www.open-model.eu, GA 953167)
- MUSICODE "*An experimentally validated multi-scale materials, process and device modelling & design*" (https://ms.hereon.de/vipcoat, GA 953187)
- VIPCOAT "*Virtual Open Innovation Platform for Active Protective Coatings Guided by Modelling and Optimization*" (http://musicode.eu, GA 952903).

Project members met regularly within joint workshops. The first workshop on Open Innovation and Standardization for materials characterization, materials modelling, materials processes and manufacturing was organized in July 2021 and by the MUSICODE consortium in the framework of the 14th International Symposium on Flexible Organic Electronics (ISFOE21) 5-8 July 2021, Thessaloniki, Greece

(www.nanotexnology.com). VIPCOAT organized a follow-up workshop on the 02.09. – 03.09.2021. The focus was on introducing the projects and to discuss interoperability mechanisms (e.g. ontologies).

The OpenModel Project (GA 953167) organised a workshop which took place on February 17th, 2022, in an online format. Around 50 representatives attended the event, the majority of them partners from the OIP projects and guests from other relevant initiatives, such as VIMMP, ReaxPro and DOME 4.0. The main focus was set on increasing the participation in events, such symposiums are open to external participants and use the active participation of EMMC to contribute to trainings more dedicated to the topic of ontologies. In summary, the following ongoing developments are of interest of OpenModel project and were suggested for common topics for joint work:

- Datamodel-based interoperability framework – Dlite (as in OntoTrans, VIPCOAT and OpenModel);
- OTEAPI (Open Translation Environment API);
- Ontologies (e.g. Hackathons in OntoCommons/OntoTrans); progressing to a common workflow ontology; it can be via an EMMC task group; at current already going on a group for OntoTrans and OpenModel, the developments can be extended for the bases of the future EMMC task on workflow ontologies.

The primary goal of the joint action was to bring together potential partners to exchange knowledge and discuss promoting activities to collaborate on the topic of interoperability and the current challenges associated with it. The DOME 4.0 project was invited to present some of its progress, particularly with regard to the interoperability challenge and its current perspectives. Adham Hashibon (UCL) was the partner representing DOME 4.0 in the OIP event.

The DOME 4.0 talk given by Adham Hashibon (UCL) focused on showing to other partners the intentions of the work on the ecosystem of DOME 4.0, including the aim of make the transaction between the data consumers and the data service providers something interoperable, this way also including the connection with other platforms, such as the marketplaces (MarketPlace/ GA 760173, VIMMP / GA760907) or OIP, for example.

In addition, it was given emphasis on some of the problem spaces that are current being discussed at this course of the DOME 4.0 project, which included:

Problem space 1	▪ Data abundance – data is always being generated (sensors, Internet of Things/Senses/Services); ▪ Data lakes store all data: substantial effort to make data actionable on-demand; ▪ Data warehouse store data processed for very specific purposes; ▪ Multiple tools and lack of interoperability between data.
Problem space 2 (Focus on the problem of interoperability in DOME 4.0)	▪ Multiple marketplaces being developed; ▪ Architecture, APIs and semantics developed on individual project level; ▪ Data and information silos exist; ▪ Lack of a digital collaborative ecosystem that connects with the marketplaces, DBs, KBs and treats market participants as equal citizens.

The DOME 4.0 approach system was presented, as illustrated in Figure 2. The main idea of the architecture that has been built is to ensure the connections that the project provides acting as a digital marketplace ecosystem.

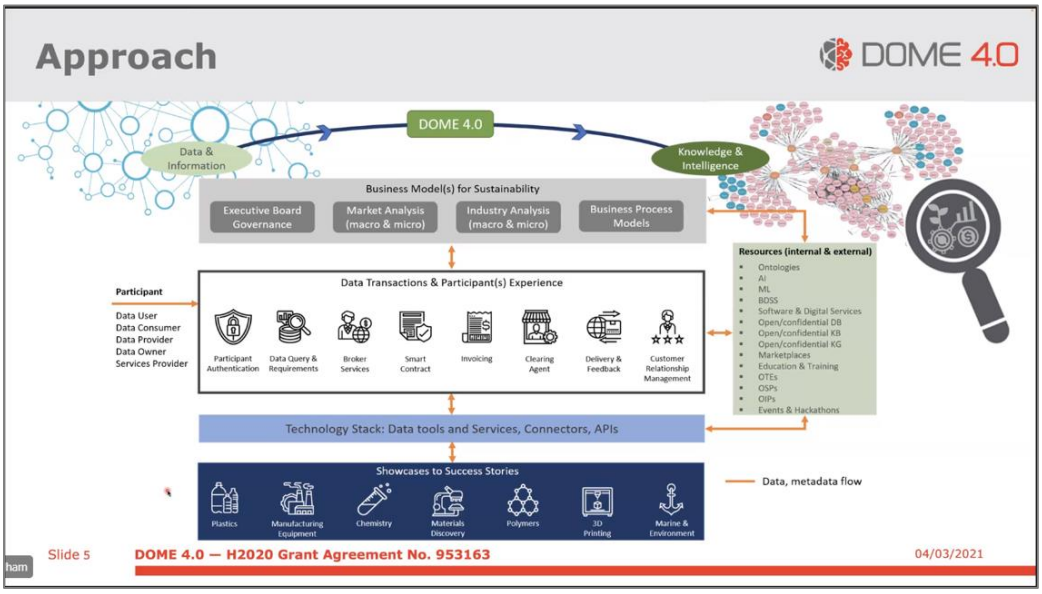

Figure 2: Digital marketplace ecosystem provided by DOME 4.0 Project. Screenshot taken at the OIP Workshop, held on 17th February 2022, online, during the presentation of DOME 4.0 performed by Adham Hashibon.

Most recently, the OntoTRANS consortium organized a Second Open OIP Workshop "*Making connections to improve the efficiency and effectiveness of innovation in materials and manufacturing*" in Bremen, Germany **07.09.2023** in which DOME 4.0 partners participated.

Table 1: List of OIP events

Date	Event	Organized by
08.07.2021	OIP Workshop	MUSICODE
01.09.2021-03.09.2021	OIP Workshop	VIPCOAT
17.02.2022	OIP Workshop	OpenModel
18.07.2022-22.07.2022	Summer School and OIP	MUSICODE
05.10.2022-06.10.2022	OIP Workshop	VIPCOAT
09.02.2023	First OIP Open Workshop	OpenModel
07.09.2013	Second OIP Open Workshop	OntoTRANS

Furthermore, in DOME 4.0 presentation summarized some of the progress and prospects of the project DOME 4.0, such as:

- The building of a connector - **A2Connect** - (**A**PI **A**ggregator to **C**onnect) with the intention to **aggregate to other marketplaces and data platforms**, in order to be a tool that does interoperability as an action, not just use the concept.
- There are **9 B2B showcases** that demonstrated cross-domain semantic interoperability, which are expecting to be include in connection with other platforms.
- The project has a **strong collaboration with OntoCommons and EMMC** to the use of ontology and taxonomy-based data representations.
- Expectation to grown on **gather more developers and managers of marketplaces and innovation platforms to connect with DOME 4.0**.

During the discussion among the participants, one of the highlighted points was about increasing the participation in disseminative actions, such as symposiums open to external participants, and also using the active participation of EMMC to contribute to trainings dedicated to the building of ontologies workflows.

In this matter during this OIP event (17.02.2022) organized by OpenModel (GA 953167), the participants agreed on the necessity of forming an *EMMC task group* that can help on joint discussions and expanding the collaboration between projects focusing on workflow ontologies. It was decided that the OpenModel (GA 953167) project would be the leader in this organization the workflow ontology task group and by sharing the initiative prospects with the other projects and interested participants.

DOME 4.0 partners also interacted with project initiatives funded by call "*Accelerating the uptake of materials modelling software (IA)*" ID: DT-NMBP-09-2018 in the **present reporting period M24 to M36** this included:

(1) ReaxPro "Software Platform for Multiscale Modelling of Reactive Materials and Processes"
(2) SimDOME " Digital Ontology-based Modelling Environment for Simulation of materials" aims to develop an industry-ready software framework for materials modelling interoperability, based on EU/EMMC standards on materials modelling, by combining, further developing and adapting existing software.
(3) INTERSECT "Interoperable Material-to-Device simulation box for disruptive electronics" wants to leverage European leadership in materials' modelling software and infrastructure, as embodied in track record of the team, to provide industry-ready integrated solutions that are fully compliant with a vision of semantic interoperability driven by standardized ontologies.

2.2.3 Cooperation in frame of the dissemination activities performed

Within the WP5 and WP6 activities, DOME 4.0 developments are presented in several events where cooperation actions are planned and established. Such events as for example the conferences in the frame of EMMC ASBL are extremely important opportunities for exchange and collaboration. In the present reporting period M24 – M36, partners of the DOME 4.0 project were continuously involved in EMMC related events and the latest activities have been added to table 2.

In the period M24 – M36, DOME 4.0 partners were also engaged in and have organized two Hackathon events. The first event was co-organized in partnership with the SimDOME project in Bologna, Italy in early January 2023 and consisted of a single-day Industrial Engagement Open Day (IEOD) plus a two-day Hackathon covering ontology development, standard vocabularies, data FAIRness, and data sharing experiences. Practical use case demonstrations from DOME 4.0 showcases were delivered in sessions focusing on hands-on experience targeted at developing tools and services to enable data sharing. The second "DOME 4.0 Open Day And Hackathon" was organized in October 2023 at the Siemens premises in Leuven, Belgium.

Also within the present reporting period, DOME 4.0 partners actively engaged in the "Second Global OntoCommons Workshop: Industry Commons Addressing Challenges of the Industry 5.0 Transition", organized in the frame of the OntoCommons project in Oslo, Norway from 13 to 16 June 2023. The workshop served as a platform to learn from other industry experts, share experiences, and explore synergies with complementary projects. At the event, data and ecosystem ontology alignment between DOME 4.0 and OntoCommons projects were discussed. Details of the workshop outcomes and opportunities are given in deliverable D5.2 "Cooperation report with NMBP-39-2020-CSA".

At the "4th EMMC International Workshop" which took place from the 26th to 28th April, 2023, the DOME 4.0 project again had the opportunity to showcase its progress and discuss current challenges and opportunities. The workshop centered around opportunities for networking, sharing knowledge, and building partnerships within the wider materials and manufacturing community. In particular, the project coordinator CMCL was invited for a talk in which they also disseminated the work carried out in the project for both showcase execution as well as the platform development. Other project partners including UNIBO, SINTEF, UKRI, and EPFL featured in different talks, panel discussions and poster presentations, disseminating other activities within the project.

Table 2: Events where cooperation actions were targeted by DOME 4.0 partners. (*) MATERIALLY was partner in DOME 4.0 before amendment performed in 2021, at current the partner taking these activities is UCL.

Date	Partner	Event	Example of Type of audience targeted
3.3.2021	CMCL	3rd EMMC International Workshop | Program https://emmc.eu/emmc-2021/program/	Industry
3.3.2021	MATERIALLY (*)	3rd EMMC International Workshop | Program https://emmc.eu/emmc-2021/program/	Industry
4.3.2021	SISW	3rd EMMC International Workshop | Program https://emmc.eu/emmc-2021/program/	Industry
20-22.4.2021	MATERIALLY (*)	RDA Virtual Plenary 17 (VP17): Opening Data for Global Challenges https://www.eventbrite.co.uk/e/rda-virtual-plenary-17-vp17-tickets-142032538145	Scientific Community / Research Community
8.4.2021	MATERIALLY (*)	Top-Level and Mid-Level Ontologies Multi-Disciplinary Workshop https://ontocommons.eu/news-events/events/top-level-and-mid-level-ontologies-multi-disciplinary-workshop	Scientific Community / Research Community
14-16.09.2021	CMCL	6th data for policy conference Data for Policy 2021 - Data for Policy	Policy Makers
17.09.2021	CMCL	Ontologies for cross-domain interoperability https://www.ohio.edu/fomi2021/index.html	Scientific Community / Research Community
20.10.2021	CMCL	Digital Around the World 2021 - 24 Hours Connecting Over the World https://digitalaroundtheworld.org/	Scientific Community / Research Community

03.11.2021	CMCL	Global Workshop: Ontology Commons addressing challenges of the Industry 5.0 transition https://ontocommons.eu/news-events/events/global-workshop-ontology-commons-addressing-challenges-industry-50-transition	Scientific Community / Research Community
03.11.2021	SINTEF	Global Workshop: Ontology Commons addressing challenges of the Industry 5.0 transition https://ontocommons.eu/news-events/events/global-workshop-ontology-commons-addressing-challenges-industry-50-transition	Scientific Community / Research Community
11-21.04.2022	CMCL	Smart Cities India - Pune Smart City and Municipal Commissionner's Office https://smartcities.gov.in/	Policy Makers
29.5 - 2.6.2022	BOSCH	SemIIM workshop at ESWC'22 https://sites.google.com/view/semiim-2022/home	Scientific Community / Research Community
29.06.2022	CMCL	Digital Twins: Laboratory and Materials - as part of the World Avatar https://www.idmt.online/digital-labs	Scientific Community / Research Community
15.06.2022	SINTEF	2 Days – Hackathon, CaNAl Summer school	Industry
13.09.2022	Fraunhofer	12th International Workshop on Formal Ontologies meet Industry (FOMI22)	Scientific Community / Industry
27-29.09.2022	CMCL	Defence TechConnect Innovation Summit and Expo Defense TechConnect Innovation Summit & Expo	Industry
3-5.10-2022	CMCL	Materials Research Exchange 2022 Materials Research Exchange (MRE) 2022 - Innovate UK KTN (ktn-uk.org)	Scientific Community / Research Community
27-29.10.2022	Fraunhofer	Industrial Engagement Open Day	Industry
7-8.11.2022	BOSCH	OntoCommons Demonstrators and Use Case Workshop	Industry

7-8.11.2022	BOSCH CMCL	Towards Materials and Manufacturing Commons - the enablers Digital Marketplaces, FAIR Principles and Ontologies	Industry
17.01.2023	CNT	Industrial Engagement Open Day	Scientific Community / Research Community
18-19.01.2023	CMCL	https://dome40.eu/dome-40-industrial-engagement-open-day-and-hackathon-1 2 Days Hackathon	Scientific Community / Research Community
4.-6.04. 2023	UNIBO	OntoCommons Workshop	Scientific Community / Research Community
26-28.04.2023	CMCL	OIP-2023 Conference 4th EMMC International Workshop	Scientific Community / Research Community
13 - 16.6.2023	CMCL	Second Global Workshop - OntoCommons Industry Commons addressing the challenges of the Industry 5.0 transition	Scientific Community / Industry
3.-4.07.2023	CMCL	The NanoMECommons Open Day Workshop,	Industry
10.-12.10.2023	CMCL, CNT	Open Day And Hackathon At SIEMENS In Leuven	Scientific Community / Industry
19-20.10.2023	SISW	OntoCommons Demonstrators and Use Case Workshop https://emmc.eu/events/oip-2023-conference/	Scientific Community / Industry
6 - 10.11.2023	CMCL	Second International Workshop on Semantic Industrial Information Modelling (SemIIM)	Scientific Community / Industry
10.11.2023	UNIBO	Knowledge Graph Alliance – KGA https://www.kg-alliance.org/	Scientific Community / Industry

2.2.4 Cooperation performed by Individual Partners

The partners officially involved in T5.3 are Fraunhofer IFAM (as lead), CMCL, UNIBO, EPFL, UKRI, INTRA and CNT. However, all the DOME 4.0 partners are active involved in further activities and or projects where DOME 4.0 have been disseminated and the cooperation opportunities are ongoing or under discussion. In the previous session the dissemination events illustrated the active participation of partners in special in events promoted by EMMC ABSL.

Among DOME 4.0 partners several are involved in further European initiatives and have the opportunity to promote cooperation and disseminate the DOME 4.0. The following Table 3 contains some examples of the initiatives the individual partners are involved with and where DOME 4.0 results are shared and re-used. For instance, within WP4 the Showcase #5 (Production equipment tools and service catalogues (metals, plastics, high-tech) is developed by INTRA and concerns the connection to and data sharing aspects with MARKET4.0 and other digital marketplaces. Another example is the participation in the workshop organized by the OntoTrans project 15-16/03/2022 in which DOME 4.0 project results were presented. The workshop was well received with 70 participants.

Table 3: Further initiatives (e.g. H2020 projects) DOME 4.0 partners are performing cooperation with.

#	Partner	Example of initiatives as H2020 projects where DOME 4.0 is considered for cooperation
1	CMCL	OntoTrans (GA 862136); OpenModel (GA 953167); SimDOME (GA 814492);
2	FHG – IWM	MarketPlace (GA 760173), OntoComons (GA 958371), SimDOME (GA 814492) OntoTrans (GA 862136), ReaxPro (GA 814416)
	FHG - IFAM	VIMMP (GA 760907), OpenModel (GA 953167), OntoTrans (GA 862136), ReaxPro (GA 814416)
3	INTRA	MARKET4.0 (GA 822064)
4	UNIBO	OntoTrans (GA 862136), SimDOME (GA 814492), OntoCommons (GA 958371)
5	EPFL	MarketPlace (GA 760173)
6	UKRI	VIMMP (GA 760907), OntoCommons (GA 958371)
7	SISW	OpenModel (GA 953167)
8	BOSCH	OntoCommons (GA 958371)
10	SINTEF	MarketPlace (GA 760173), OntoTrans (GA 862136), OntoCommons (GA 958371)
12	UCL	OpenModel (GA 953167)
13	CNT	Repair 3D (GA 814588)

2.2.5 Cooperation in frame of the EMMC ASBL Activities

As mentioned in the previous sections the DOME 4.0 consortium partners are active in the frame of the projects under the EMMC umbrella. Thus, the EMMC ASBL (European Materials Modelling Council/https://emmc.eu/) is a crucial entity to align developments, to support performing cooperation and to disseminate the developments of the DOME 4.0 project.

DOME 4.0 partners were invited to the 4th EMMC International Workshop in Vienna in 2023:

- #EMMC2023 "*Materials & Digitalisation: the backbone of the Green Transition*" https://emmc.eu/emmc-2023

The specific focus of the meeting was on digitalisation advances for materials innovation and the green transition, for example by providing the ability to carry out monitoring and tracking, simulation and forecasting, visualisation, systems and knowledge management and by enabling new levels of interactions.

3. Conclusions / Next Steps

The progress of collaboration activities in the period M1 to M36 was summarized in this current document (D5.4). The plan is to continue cooperating with all the mentioned initiatives and emphasizing the cooperation under EMMC umbrella as for instance with the OIPs Projects as well as with the OntoCommons consortium.

All individual DOME 4.0 partners are active in the T5.3 and will continuing taking all opportunities possible to broaden and strengthen the cooperation actions. The activities of cooperation in frame of the workflow ontology started officially by the end of 2022 and will be a crucial mechanism to keep the exchange among projects.

4. Lessons learnt

Ongoing interactions of DOM4.0 partners with initiatives such as the OntoCommons CSA-project as well as cooperations under the EMMC umbrella have proven vital to focus the work in DOME 4.0 on industrially relevant aspects. The cooperation efforts included technical discussions, shared dissemination activities, sustainability, and business model discussions and have contributed to community-building within Industry Commons related activities to broaden and strengthen the network of the DOME 4.0 project.

5. Deviations from Annex 1

No deviations from Annex 1.

6. References

[1] Grant Agreement number: 953163 — DOME 4.0 — H2020-NMBP-TO-IND-2018-2020.

7. Acknowledgement

The author(s) would like to thank the partners in the project for their valuable comments on previous drafts and for performing the review.

Project partners:

#	Type	Partner	Partner full name
1	SME	CMCL	Computational Modelling Cambridge Limited
2	Research	FHG	Fraunhofer Gesellschaft zur Förderung der Angewandten Forschung E.V.
3	Research	INTRA	Intrasoft International SA
4	University	UNIBO	Alma Mater Studiorum – Universita di Bologna
5	University	EPFL	Ecole Polytechnique Federale de Lausanne
6	Research	UKRI	United Kingdom Research and Innovation
7	Large Industry	SISW	Siemens Industry Software NV
8	Large Industry	BOSCH	Robert Bosch GmbH
9	SME	UNR	Uniresearch B.V.
10	Research	SINTEF	SINTEF AS
11	SME	CNT	Cambridge Nanomaterials Technology LTD
12	University	UCL	University College London

This document is part of a project that has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 953163. It is the property of the DOME 4.0 consortium and do not necessarily reflect the views of the European Commission.

8. Table of Abbreviations

Abbreviation	Explanation
BDSS	Business Decision Support Systems
DBs	Data Bases
KBs	Knowledge Bases
EAB	External Advisory Board
EOSC	European Open Science Cloud
FAIR	Findable, Accessible, Interoperable, Reusable
IDS	International Data Spaces
IDSA	International Data Spaces Association
MVP	Minimum Viable Product
OIPs	Open Innovation Platforms
OSPs	Open Simulation Platforms
OTEs	Open Translation Environments
RDA	Research Data Alliance
SC	Sub-Committee
SMEs	Small and medium-sized enterprises
TC	Technical Committee