DOME 4.0

Deliverable D5.3 – Progress report of the interactions with other relevant initiatives v1

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Project Profile

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Project number	**953163**
Acronym	**DOME 4.0**
Title	**Digital Open Marketplace Ecosystem 4.0**
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Duration	**48 months**

Document History

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V0.1	11.05.2022	Welchy Leite Cavalcanti	First draft
V0.2	20.10.2022	Welchy Leite Cavalcanti	Updates of ongoing cooperation activities – second draft
V0.3	01.11.2022	Peter Schiffels	Updates - Third Draft
V0.4	07.11.2022	Peter Schiffels	Draft including partners contributions and finalization
V0.5	15.11.2022	Bijan Yadollahi	Modifications, review and Comments
V0.6	24.11.2022	Peter Schiffels	Review
V1.0	28.11.2022	Emanuele Ghedini	Review and additions
V1.1	30.11.2022	Peter Schiffels	Final version
V1.2	30.11.2022	Amit Bhave and Willem van Dorp	Finalization and final approval

Publishable Summary

The DOME 4.0 project covers a wide range of activities, and henceforth, cooperation with relevant initiatives shall also cover multiple pathways, namely, technical discussions and collaboration, shared dissemination activities, sustainability, and business models, etc. The plan considers these pathways and attempts to maximise the mutual benefits of cooperation with other projects and initiatives.

The EMMC ASBL (European Materials Modelling Council/https://emmc.eu/) is a crucial entity to align developments, and to support performing cooperation and to disseminate the developments of the DOME 4.0 project. 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 crucial 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 under the EMMC umbrella is the collaboration with the OntoCommons project (GA 958371 / approved under the call NMBP-39-2020-CSA).

Regarding the topics for cooperation, and technologies available at current to be exchanged in frame of collaboration it can be highlighted:
- The building of a connector - A2Connect - (API Aggregator to Connect) 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.
- Use of ontology and taxonomy-based data representations.

Executive Summary

The current deliverable - **D5.3: Progress report of the interactions with other relevant initiatives v1** - summarises the plan and progress of the interactions with other relevant initiatives and associations taking into account for cooperation with DOME 4.0. It outlines the responsibilities as well as in-project plans for dealing with such activities and gives a prospectus of the cooperation so far. Mainly, the D5.3 covers the work performed in Task 5.3 (Interactions with Relevant Initiatives and Associations) from M1 to M24.

The DOME 4.0 project covers a wide range of activities, and henceforth, cooperation with relevant initiatives shall also cover multiple pathways, namely, technical discussions and collaboration, shared dissemination activities, sustainability, and business models, etc. The plan considers these pathways and

attempts to maximise the mutual benefits of cooperation with other projects, as detailed in the D5.1 (Coordination of Cooperation Report).

The T5.3 will deliver two progress reports due respectively on M24 (D5.3) and M36 (D5.4):

- D5.3 - Progress Report of the interactions with other relevant initiatives, v1 (FRAUNHOFER, R, PU, M24) – regarding the current activities planned until M24 and further planning to extend the collaboration with other relevant projects.
- D5.4 - Progress Report of the interactions with other relevant initiatives, v2 (FRAUNHOFER, R, PU, M36).

Further developments regarding the activities on cooperation will be then updated within the D5.4.

DOME4.0 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 crucial 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 under the EMMC umbrella is the collaboration with the OntoCommons project (approved under the call NMBP-39-2020-CSA) and it is shortly presented within this report. However, due to the importance of the alliance with that project, special attention has been paid to laying out appropriate task and plans for frequent and regular communication with that project, which will be reviewed in deliverable D5.2 (lead BOSCH, due M36).

Regarding the topics for cooperation, and technologies to be exchanged in frame of collaboration at current can be highlighted:

- The building of a connector - A2Connect - (API Aggregator to Connect) 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.
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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. In the following, is shown the list of the main objectives of WP5, according to DOME 4.0 Grant Agreement (GA 953163):

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 (D5.3 – Progress of the interactions with other relevant initiatives, v1)**, the main focus is to detail the activities within T5.3, i.e. to capture the progress of collaboration and interactions with other active and relevant data platform initiatives and associations, such as planning the next events, to achieve more scalability within the project. 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.

This task will deliver two progress reports due respectively on **M24 (D5.3)** and **M36 (D5.4)**:

- **D5.3** - Progress Report of the interactions with other relevant initiatives, v1 (FRAUNHOFER, R, PU, M24) – regarding the current activities planned until M24 and further planning to extend the collaboration with other relevant projects.

- **D5.4** - Progress Report of the interactions with other relevant initiatives, v2 (FRAUNHOFER, R, PU, M36).

Moreover, the activities in frame of WP5 particularly task 5.3 here described, is in alignment with the 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 and create a solid and reputed DOME 4.0 Ecosystem, turning DOME 4.0 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)

In addition, WP5 connects to the technical WPs developments in order to achieve an adoption of DOME4.0 developments by several cooperation initiatives and institutions (academy and industry). The WP5 Task 5.3 actions follow the WP6 strategy which is implemented in implemented in two phases, based on the project's results:

1. Awareness raising: During this phase, the strategy will mostly focus on raising the awareness about the project as well as on engaging the potentially interested stakeholders in the project's activities. The WP5 T5.3 in this phase is described in this current report, and
2. Engagement phase: A more result-oriented approach, with emphasis on the real outcomes of DOME 4.0 and the dissemination being more focused on the actual product of the project via the channels of cooperation identified and established within the phase of awareness, the phase 2 activities in WP5 task 5.3will be described in the D5.4.

DOME4.0 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 crucial 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 under the EMMC umbrella is the collaboration with the OntoCommons project (approved under the call NMBP-39-2020-CSA) and it is shortly presented within this report. However, due to the importance of the alliance with that project, special attention has been paid to laying out appropriate task and plans for frequent and regular communication with that project, which will be reviewed in deliverable D5.2 (lead BOSCH, due M36).

Regarding the topics for cooperation, and technologies to be exchanged in frame of collaboration at current can be highlighted:

- The building of a connector - A2Connect - (API Aggregator to Connect) 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.

- Use of ontology and taxonomy-based data representations.

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 intended to actively participate in EC activities related to data and digital marketplaces organised at the programme level.

The Industry Commons Manager - ICM **(BOSCH, Evgeny Kharlamov)** is responsible to ensure effective partnership with **NMBP-39-2020-CSA** and the cooperation activities with Industry Commons, by planning the participation and collaboration events that disseminate the DOME 4.0 project.

Engagement with external parties will also be strengthened through an **External Advisory Board, EAB** comprising members from IDSA, EOSC projects, large industrials, as well as SMEs actives within the industrial data and knowledge economy.

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 Open Translation Environments, OTEs and Buisiness Decision Support Systems, BDSS projects;
- Ensuring consistency, **data and software interoperability** by embracing standardised data documentation;
- Adopting **FAIR data principles** in cooperation with International Data Spaces (IDS), Research Data Alliance (RDA), EOSC, Industry 4.0 and Industry Commons.
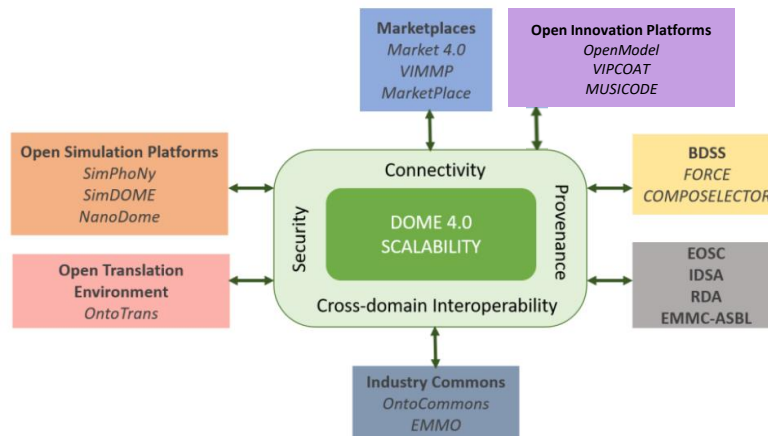
Figure 1: Integration and cooperation activities of DOME 4.0. Adapted from DOME 4.0 Grant Agreement to include the cooperation with OIP projects.

2.2 Progress of cooperation with relevant initiatives

DOME 4.0 partners planned some actions for cooperation with similar data platforms, such as DTNMBP-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 (M24).

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) aimed to provide an alignment between DCAT dataset metadata and a larger framework based on the EMMO, one of the Top Level Ontologies included in the OntoCommons Eco System
- Cooperation in the definition of the technical specifications of OCES compliant ontologies
- Cooperation with the OntoCommons WP2 and WP3 for the definition of bridge concepts to facilitate domain ontologies alignment with the OntoCommons Top Reference Ontology.
- Joint publication on Bosch 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 transfer

Details about this collaboration will be presented in the deliverable **D5.2 - Cooperation Report with NMBP-39-2020**, due M36.

2.2.2 Cooperation with H2020 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 has already started the cooperation by taking part in the workshop of **Open Innovation Platforms (OIPs)** projects. The OIP projects (H2020 projects approved under the same call (DT-NMBP-11-2020 - Open Innovation Platform for Materials Modelling (RIA)) are: OpenModel (GA 953167), MUSICODE (GA 953187) and VIPCOAT (GA 952903). The OpenModel Project (GA 953167) organised the 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 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 DOME4.0 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 give emphasis on some of the problem spaces that are current being discussed at this course of the DOME4.0 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 <u>collaborative ecosystem</u> 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.

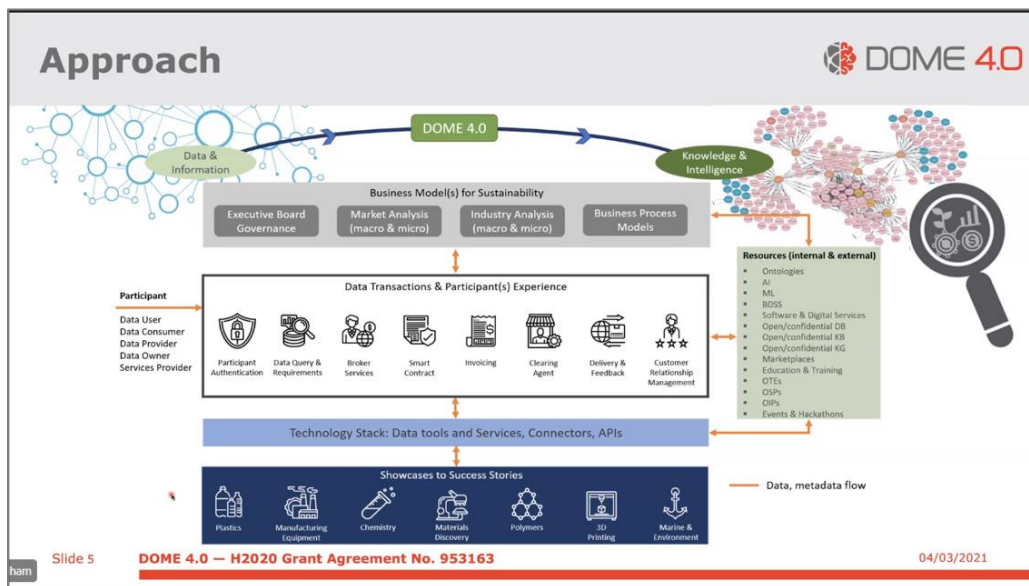**Figure 2:** Digital marketplace ecosystem provided by DOME 4.0 Project. Screenshot taken at the OIP Workshop, held on 17th February 2022, online, during the presentation of DOME 4.0 performed by Adham Hashibon.

Among the remarks in the end of the presentation was the introduction of the DEMO of DOME 4.0, which is already running as an MVP prototype (available into the webpage https://dome.the-marketplace.eu).

Adham mentioned that the idea of the DEMO it is stated to work on enable the connection of databases. A screenshot of the MVP scheme is shown on Figure 3.
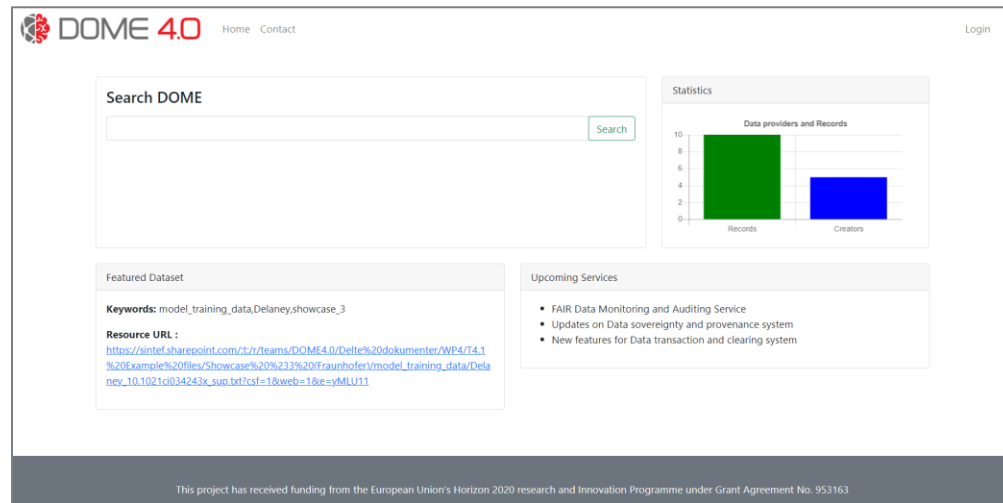

Figure 3: Screenshot on the demonstration of DOME 4.0 DEMO, enabling to make the connection of databases. The DEMO is available on the webpage https://dome.the-marketplace.eu

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.

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. For instance, a few example of relevant events are presented in Table 1.

Table 1: Few example of events where cooperation actions were targeted by DOME4.0 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
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
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	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
29.5 - 2.6.2022	BOSCH	SemIIM workshop at ESWC'22 https://sites.google.com/view/semiim-2022/home	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
29.06.2022	CMCL	Digital Twins: Laboratory and Materials - as part of the World Avatar https://www.idmt.online/digital-labs	Scientific Community / Research Community
17.09.2021	CMCL	Ontologies for cross-domain interoperability https://www.ohio.edu/fomi2021/index.html	Scientific Community / Research Community

| 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 |

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 being 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 Table 2 contains some example 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 DOME4.0 project results were presented. The workshop was well received with 70 participants.

Table 2: 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); SimDOME (GA 814492); OpenModel (GA 953167)
2	FRAUNHOFER	FRAUNHOFER IWM: MarketPlace (GA 760173); OntoComons (GA 958371); SimDOME (GA 814492) FRAUNHOFER IFAM: VIMMP(GA 760907); OpenModel (GA 953167) FRAUNHOFER IWM and IFAM: OntoTrans (GA 862136); ReaxPro (GA 814416)
3	INTRA	MARKET4.0 (GA 822064)
4	UNIBO	OntoTrans (GA 862136); SimDOME (GA 814492); OntoCommons (GA 958371); OpenModel (GA 953167)
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)

2.2.5 Cooperation in frame of the EMMC ASBL Activities

As mentioned in the previous sections DOME 4.0 consortium cooperation is very active in 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. The next planned EMMC event where DOME 4.0 will be represented is the 4th EMMC International Workshop in Vienna in 2023 (https://emmc.eu/emmc-2023/).

3. Conclusions / Next Steps

The progress and planning for collaboration of relevant initiatives with DOME 4.0 was summarized in this current document (D5.3). 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 (e.g. OpenModel - GA 953167). The OIP collaboration had just started in the beginning of the current year.

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. The progress of mentioned cooperation plan in frame of the current D5.3 will be presented in D5.4 (Progress Report of the interactions with other relevant initiatives, v2) due M36.

4. Lessons learnt

The interoperability challenges with a digital ecosystem approach and the diversity of the nine B2B showcases within the DOME 4.0 project provided the impetus for cooperation between the DOME4 consortium partners and other external initiatives. Deep-dive technical discussions and alignment of technologies implemented, joint dissemination activities, sharing the lessons learnt and ongoing discussions between projects have played a direct role in shaping the DOME 4.0 development. As an example, the EMMC ASBL (European Modelling Council) served as a crucial entity to frame the discussions and align common goals. The Open Innovation Platforms (OIP) such as OpenModel, open translation environment project such as OntoTrans and the OntoCommons CSA project have been highlighted as crucial drivers in evolving the ecosystem approach. Driven by the demands of the B2B showcases, the consortium was able to focus on aspects relevant for industrial applications and it became eminent that a consistent and unified data documentation with open semantic specifications based on a common language and ontologies can serve the use cases best.

5. Deviations from Annex 1

There are 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	FRAUNHOFER	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

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