



AloTwin

Twinning action for spreading excellence in Artificial Intelligence of Things

DELIVERABLE D3.3

REPORT ON JOINT PAPER PREPARATION, CONFERENCE ATTENDANCE AND D/C/E ACTIVITIES (1)



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D3.3 Report on joint paper preparation, conference attendance and D/C/E activities (1)

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Executive Summary

This deliverable reports on the activities related with joint paper preparation, conference attendance, and dissemination, communication and exploitation during the first 17 months of the AloTwin project. The work described in this deliverable is carried out in the context of WP3, which is responsible for coordinating the activities of the consortium that promote networking, visibility and wide dissemination of the project results and facilitate the definition of individual and joint exploitation plans.

These activities are driven by an evolving dissemination, communication and exploitation plan, set out in D3.7 and maintained as a living document. Following the current state of this plan, this deliverable provides an overview of the consortium's dissemination activities and related achievements, including the organization of the first AloTwin summer school, publications of scientific papers, and participation in events. Furthermore, it reports on the communication activities of the consortium and their measurable outcomes with the objective of reaching different communities and stakeholders, as well as on the project's exploitable results thus far.

The key relevant achievements of the project during the reported period are summarised below.

Dissemination: 2 journal articles and 12 conference publications; organization of the 1st AloTwin Summer School and planning of the 2nd, that will include joint sessions and a technical workshop with the SmartEdge Horizon Europe project, thus fostering collaboration between the two consortia, and industrial and academic outreach.

Communication: Growing follower base in social media accounts (e.g., 449 LinkedIn followers with the target at >500; more than 20K impressions and 3.7K engagements in Linked in and Twitter/X, with the target at >1000 social interactions); 2 videos, 1 technical blog post, and 7 tutorials publicly available from the project's website.

Exploitation: Middleware architecture design (exploitable result ER1) detailed in D1.1; current version of middleware implementation (exploitable result ER2) detailed in D1.3 and available as open source (<https://github.com/AloTwin>); further exploitation results in terms of knowledge transfer, increased innovation and management capacity, improved research skills, and raised academic and research profiles derived from the activities of WP2, WP3, and WP4.

1 Introduction

1.1 Deliverable Context and Description

This deliverable presents activities and achievements of the AloTwin project in the context of WP3 (Networking, Visibility and Dissemination) between months M1 and M17. This work has been executed in accordance with the project's initial plan for dissemination, communication and exploitation (deliverable D3.7).

WP3 is broken down into 4 main tasks: (i) summer school organization (T3.1), (ii) planning, preparation, and publication of joint papers (T3.2), (iii) attendance of conferences, workshops and tutorials (T3.3), and (iv) general dissemination (T3.4). The activities reported in this deliverable pertain to all four tasks.

Currently, the project is at the end of the **Interest phase** (M7-M18) of the dissemination plan, preceded by an *Awareness phase* (M1-M6; reported in D3.7), and moving towards its final *Engagement phase* (M19-M36). The major focus of the Interest phase has been to stimulate interest in the project's activities. This has taken place by means of a targeted use of dissemination and communication channels, particularly via social media postings and material on the project's website based on expert visits, hands-on trainings, and the 1st AloTwin summer school. This material notably includes publicly available tutorials by consortium members and technical blog posts. Importantly, and paving the way towards the Engagement phase that is about to commence, the consortium partners, individually and jointly, have produced (and planned) a significant number of scientific papers. Conference and journal publications are accompanied by open-source software implementing the AloTwin middleware for data-driven orchestration in the computing continuum. This implementation is continuously evolving following the progress made in the context of WP1 and, together with the middleware architecture and its validation, constitute the key exploitable results of the project which will be further disseminated during the Awareness phase.

1.2 Deliverable Outline

Section 2 provides a summary of the Dissemination, Communication and Exploitation Plan, which is the subject of deliverable D3.7 that is maintained as a living document, and drives dissemination, communication and exploitation activities of the project that are reported in this deliverable.

Section 3 focuses on dissemination activities, as implemented during Summer Schools and via scientific publications. We first provide a brief overview of the first two summer schools, one completed and one upcoming; more details about them are presented, respectively, in deliverables D3.2 and D3.3. We then summarise the project's strategy regarding open science, publications, and participation in scientific events, and list the project's main achievements in terms of publications and participation to events.

Section 4, in turn, focuses on communication. It first summarises the project's communication plan (detailed in deliverable D3.7) and reports on the targets and the results of the communication activities achieved so far.

Section 5 briefly presents the project's exploitation plan and its results. Key exploitable results are based on the outcome of the research activities of WP1, in accordance with the project's joint exploitation plan. The status of these activities is reported in detail in deliverables D1.1, D1.2 and D1.3. A significant number of exploitation results according to the individual exploitation plans of the partners, also presented in this section, draws from WP2, WP3 and WP4.

Section 6 concludes this deliverable.

2 Dissemination, Communication, and Exploitation Plan Summary

The initial plan outlined in deliverable D3.7 for the dissemination, communication, and exploitation activities of the AloTwin project has been successfully executed thus far. Through a series of strategic initiatives, the project has achieved several key objectives.

The main objective has been to raise public awareness of the project and generate scientific interest by showcasing its objectives, methodologies, and technological advances. To this end, a solid online presence was established via a dedicated project website at <https://www.aiotwin.eu> and a wide audience was actively targeted via social media. The project utilised the IoTLab@FER LinkedIn page and Twitter/X account to disseminate information, resulting in significant outreach and the development of a loyal following.

Additionally, the project effectively communicated its progress and shared insights through targeted activities such as social media campaigns, infographics, videos, technical blogs, and the summer school held in Šibenik, Croatia in 2023. These efforts facilitated knowledge sharing and generated interest in expert visits and hands-on training sessions.

Furthermore, a key focus of the project has been to disseminate the knowledge, methods, and technologies developed and evaluated during the project. These dissemination efforts align closely with the plan outlined in the relevant deliverable, ensuring that project outcomes reach a wide audience.

3 Dissemination activities

3.1 Summer schools

During the entire project period, three summer schools are planned, which will be organised once a year in Croatia and attended by all AloTwin partners. The summer schools serve as a meeting point for a broader group of experts working in the field of AIoT who will prepare a comprehensive lecture programme. Target groups are Ph.D. students and possibly MS students from all AloTwin institutions as well as other Croatian universities (Split and Osijek) and beyond. A technical hands-on training and an entrepreneurial workshop will be integral parts of the summer school programme.

The first summer school took place in Šibenik, Croatia, from 4 to 7 September 2023. During the summer school, each partner offered a hands-on training, workshop, or a lecture for the participants. We also included sessions on for the development of skills for Ph.D. students. The report from the 1st summer school, including programme and materials, is available on the project website: https://aiotwin.eu/aiotwin/activities/1st_summer_school.

The second summer school is scheduled for September 16th to 20th 2024 and is set to take place in the city of Dubrovnik, Croatia (Venue: University of Zagreb / Sveučilište u Zagrebu [Centre for Advanced Academic Studies \(CAAS\)](#)).

The event will be organised in collaboration with the EU funded project SmartEdge. The summer school program will include invited talks, technical tutorials, hands-on sessions with advanced hardware, and poster sessions showcasing the latest research results by Ph.D. students. In addition, the program includes

a technical workshop on “Edge AI meets Swarm Intelligence”. The call for papers for the technical workshop is open by June 15th, 2024 and is published at: <https://www.smart-edge.eu/2024/05/06/call-for-papers-workshop-edge-ai-meets-swarm-intelligence/>.

Proposed agenda for the 2nd AloTwin Summer School

- 16-17 September – AloTwin Summer School: Keynote talks, Tutorials, Hands-on workshops
- 18 September – Joint Sessions SmartEdge & AloTwin: Technical Workshop on “Edge AI meets Swarm Intelligence”, Poster session, SmartEdge open-door demonstration
- 19-20 September – SmartEdge Summer School: Keynote talks, Hands-on sessions

3.2 Publications and event participation

This section reports on work carried out in the context of tasks T3.2 (Planning, preparation, and publication of joint papers) and T3.3 (Attendance of conferences, workshops, and tutorials) of WP3. The consortium’s strategy aims to achieve the following key goals: (i) attendance to scientific events by means of submitting and presenting high-quality conference papers, so that the project’s visibility is increased and feedback from the international scientific community is acquired; (ii) ensuring the maximum outreach and reusability of the project’s outcomes following Open Access publishing practices in line with the requirements set out in the programme.

Table 2 presents a list of conference and workshop publications produced by the consortium so far. Therefore, 12 such events have (or will be) attended by members of the consortium. Notable venues are **IEEE EDGE 2023** and **IEEE EDGE 2024** (part of the IEEE World Congress on Services, flagship event of the IEEE Technical Community on Services Computing), **IEEE ICC 2023** (flagship event of the IEEE Communications Society, with approximately 2000 attendees), and the **21th Extended Semantic Web Conference**.

3.2.1 Publication strategy and planning

Deliverable D3.7 provides details on the strategy followed by the consortium in terms of selecting candidate venues for disseminating the project’s results towards the scientific community. The consortium maintains an evolving list of target conferences, workshops and journals (including relevant special issues) that is consulted by the partners, though it is not exhaustive, not mandatory to follow, and serves mainly as a guide. This list is hosted in the project’s internal collaboration platform and is reflected in D3.7.

3.2.2 Open science practices

With respect to open access to publications and FAIR research data management, AloTwin strictly adheres to the open science guidelines specified in the Horizon Europe Programme Guide¹ (v4.1, May 2024). AloTwin pursues the publication of project results in open access venues, when this option is optimal and possible for a particular publication in terms of scientific impact and visibility, as well as availability of funds for publication fees. Irrespective of the nature of the venue (open-access, closed, or hybrid), AloTwin publications are also deposited in trusted repositories. In particular, the authors of AloTwin-supported publications use the Zenodo.org European OA repository and/or the Computing Research Repository (CoRR) (a partnership of ACM, arXiv.org and others). The peer-reviewed scientific publications

¹ <https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/programme-guide-horizon-en.pdf>

are published under the latest available version of the Creative Commons Attribution International Public Licence (CC BY 4.0).

To ensure compliance with open-access publication requirements, at the same time dealing with potentially diverse requirements of different publishers, the consortium has thoroughly reviewed the policies of the most significant publishers in the scientific disciplines relevant to the project (IEEE, ACM, Elsevier and Springer), and has distilled a detailed workflow to be applied by the partners when making publications derived from project work available as open-access. This workflow is presented in Figure 1.

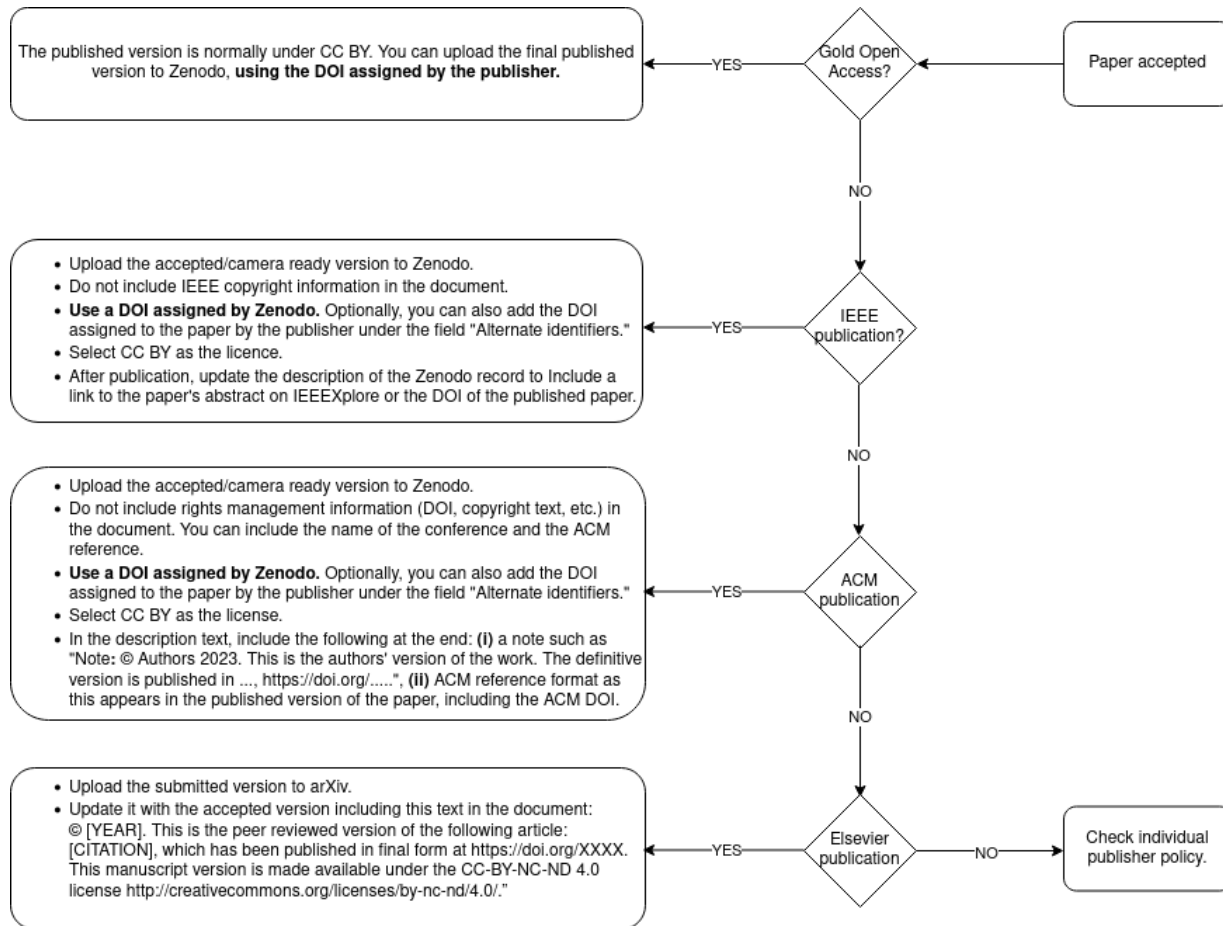


Figure 1 Open access publishing workflow.

Further details on open science practices are provided in D5.1 (Data Management Plan; living document).

3.2.3 Achievements

The consortium has already published **two articles** in international journals (Table 1) and **12 conference and workshop papers** (Table 2). The latter were or will be presented by members of the consortium in the respective venues. These papers are available open-access either directly via the publishers' websites, Zenodo, or Arxiv.

In terms of publication counts, the consortium has **already met the following KPIs**:

- Total AloTwin scientific publications ≥ 12
- Participation in ≥ 8 conferences and workshops

The consortium anticipates that during the second half of the project, it will meet the target of **3 journal and 6 conference joint publications** based on ongoing work in the context of WP1 and short-term staff exchanges. Currently, **one joint (UNIZG-FER & TUW) conference paper** has been accepted and will be presented at the IEEE International Conference on Edge Computing & Communications (EDGE 2024) in July 2024, while already several joint papers are either under review or in preparation to be submitted by Q4 2024.

Table 1 Publications in journals (2)

	Authors		Title	Publication	Year	Open-access URL
1	B. Sedlak, I. Murturi, P. Kumar Donta, S. Dustdar	TUW	A Privacy Enforcing Framework for Data Streams on the Edge	IEEE Transactions on Emerging Topics in Computing	2023	https://zenodo.org/records/10658151
2	P. Kumar Donta, I. Murturi, V. Casamayor Pujol, B. Sedlak, S. Dustdar	TUW	Exploring the Potential of Distributed Computing Continuum Systems	MDPI Computers	2023	https://www.mdpi.com/2073-431X/12/10/198 https://zenodo.org/records/10658186

Table 2 Conference Publications (12)

	Authors		Title	Publication	Year	Open-access URL
1	I. Čilić, V. Jukanović, I.P. Žarko, P. Frangoudis, S. Dustdar	UNIZG-FER, TUW	QEdgeProxy: QoS-Aware Load Balancing for IoT Services in the Computing Continuum	IEEE International Conference on Edge Computing & Communications (EDGE 2024)	2024	https://arxiv.org/abs/2405.10788
2	A.P. Jukić, A. Šelek, M. Seder, I.P. Žarko	UNIZG-FER	Autonomous Driving with a Deep Dual-Model Solution for Steering and Braking Control	9th International Conference on Smart and Sustainable Technologies (SpliTech 2024)	2024	https://arxiv.org/abs/2405.06473
3	S. Holzer, P. Frangoudis, C. Tsigkanos, S. Dustdar	TUW	SMT-as-a-Service for Fog-Supported Cyber-Physical Systems	25th International Conference on Distributed Computing and Networking (ICDCN '24)	2024	https://zenodo.org/records/10101313

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4	J. Guan, Q. Zhang, I. Murturi, P. Kumar Donta, S. Dustdar, S. Wang	TUW	Collaborative Inference in DNN-based Satellite Systems with Dynamic Task Streams	IEEE International Conference on Communications (ICC)	2024	https://zenodo.org/records/10658238
5	Jicheng Yuan, Anh Le-Tuan, Manh Nguyen-Duc, Trung-Kien Tran, Manfred Hauswirth, Danh Le-Phuoc	TUB	VisionKG: Unleashing the Power of Visual Datasets via Knowledge Graph	21th Extended Semantic Web Conference (ESWC2024)	2024	https://arxiv.org/pdf/2309.13610
6	N. Duong-Trung, D.-M. Nguyen, D. Le Phuoc	TUB	Temporal Saliency Detection Towards Explainable Transformer-based Timeseries Forecasting	The 3rd International Workshop on Explainable and Interpretable Machine Learning (XI-ML), Krakow, Poland	2023	https://arxiv.org/abs/2212.07771
7	I. Murturi, P. Kumar Donta, V. Casamayor-Pujol, A. Morichetta, S. Dustdar	TUW	Learning-driven Zero Trust in Distributed Computing Continuum Systems	The 21st IEEE International Conference on Pervasive Intelligence and Computing (PICom 2023), Abu Dhabi, UEA.	2023	https://zenodo.org/records/10657927
8	I. Murturi, P. Kumar Donta, S. Dustdar	TUW	CommunityAI: Towards Community-based Federated Learning	The Fifth IEEE International Conference on Cognitive Machine Intelligence (CogMI 2023), Atlanta, USA.	2023	https://zenodo.org/records/10658108
9	A. Le-Tuan, D. Bowden, D. Le-Phuoc	TUB	Semantic Programming for Device-Edge-Cloud Continuum	CLOUD-EDGE CONTINUUM (CEC) WORKSHOP 2023	2023	https://arxiv.org/abs/2308.10555
10	X. Guo, A. Le-Tuan, D. Le-Phuoc	TUB	Building a P2P RDF Storage for Edge Devices	The IoT Conference	2023	https://arxiv.org/abs/2309.09364
11	C. Bicer, I. Murturi, P. Kumar Donta, S. Dustdar	TUW	Blockchain-based Zero Trust on the Edge	10th Annual Conf. on Computational Science & Computational Intelligence (CSCI'23)	2023	https://zenodo.org/records/10658080

12	E. Govori, I. Murturi, S. Dustdar	TUW	A Comprehensive Performance Evaluation of Procedural Geometry Workloads on Resource-Constrained Devices	2023 IEEE International Conference on Edge Computing and Communications (EDGE)	2023	https://zenodo.org/records/11242731
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4 Communication activities

Communication efforts focus primarily on the use of social media to disseminate information and engage with target audiences by directing them to our project website, which serves as the main hub for information about our activities and achievements.

The communication activities carried out so far have already yielded significant results. Several goals have been successfully achieved by attracting PhD students to participate in the 1st AloTwin Summer School and interactions with users on social platforms.

4.1 Overview of communication plan

An overview of the communication plan with the specified tools and channels with description and KPIs can be found in Table 3.

Table 3 Overview of communication plan detailing tools and channels with KPIs

Tools and channels	Description	KPI
The project website	The project website. Information about the project, including the progress and published results, will be made available online in line with the open science practices specified in Section 3.2.2. The consortium will maintain a technical blog reporting expert visits and hands-on trainings to bring interesting research results and technologies closer to interested audiences in a simplified style of writing compared to scientific papers.	1 Project website ≥10 blog posts ≥1000 unique visits per year
Social networks	The existing social media channels of IoT Lab will be used for project promotion to leverage an existing base of engaged followers, while the same channels will be available to sustain the project impact after its end. We will work to expand the outreach significantly outside of Croatia.	≥500 followers on LinkedIn ≥100 followers on Twitter ≥20 posts yearly
Videos	Nothing disseminates ideas and results better than videos! Thus, we plan to produce one video about the project's motivation, goals and RDs. This video is planned to be disseminated on social networks and shown at exhibitions and fairs. It will be accompanied with short interviews and statements of researchers and experts involved in the project as well as services	≥6 videos

	providers and end users experience with novel technologies. Early-stage researchers participating in short visits will produce videos about their research and experiences gained at the visited partnering institution, and videos promoting the developed middleware and use case will be produced.	
General media	Media appearances (TV interviews, popular science shows, podcasts) and articles in newspapers will be used to spread information about the project using everyday examples to the general public.	≥ 3 appearances in general media
Participation at industry fairs	We plan to inform the industry about the goals and results of our project by targeted talks and exhibitions. It is our aim to generate a first momentum by making industry stakeholders aware of the emerging fields relevant to A IoT, and additionally to gather significant input/feedback. We plan to participate at events like IoT Week and IoT Solutions World Congress. Among others, consortium participation at such events will have the purpose of partnering to increase funding opportunities.	≥ 2 participations during the project
Scientific publications	Our scientific publications dissemination strategy is two-fold concerning the selection of journals we plan to submit our articles to. On the one hand we plan to publish papers in high-ranked scientific journals which have a broad scope of readers (e.g., IEEE Communications Magazine, IEEE Access). On the other hand, we plan to target focused journals relevant to identified RDs (IEEE Internet of Things Journal, Semantic Web journal, ACM Transactions on Autonomous and Adaptive Systems). We will pursue the early and open access approach as detailed in Section 3.2.2.	≥ 3 joint journal papers
Conferences, workshops and tutorials	One of the project objectives is to increase research sharing with the scientific community. Therefore, we will present the project results at top tier conferences and workshops, and organise and prepare at least one tutorial during the last year of the project.	≥ 6 joint conference papers, participation in ≥ 8 conferences/workshops and 1 tutorial held
“Open door” events	The main purpose of open-door events organization is to significantly increase the visibility of IoT-related research with the general public, existing and future students of computer science and engineering. We will pay special attention to younger generations as IoT is an attractive field of study that is strongly related to STEM. Our plan is to actively participate in existing open doors events at all institutions (e.g., University of Zagreb and UNIZG-FER organise such events yearly).	Participation in ≥ 3 “open door” events

<p>Summer schools</p>	<p>Summer schools are the strategic networking activities (Section 3.1) organised on annual basis which in addition to spreading knowledge have a D & C dimension since they are open to participants outside the AloTwin consortium. The primary target groups are PhD students from other Croatian universities working in the IoT field.</p>	<p>1 summer school per year</p>
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4.2 Communication activities

The targets and the results of the communication activities achieved so far are listed in Table 4. More details can be found in Deliverable 3.7.

Our communication strategy is such that we regularly track and report project activities on the project website under the news tab (<https://aiotwin.eu/aiotwin/news>), and then promote the published news on social media and, when relevant, on the UNIZG-FER web-site (<https://www.fer.unizg.hr/>).

Table 4 Communication activities carried out so far with overall targets

Target	Description - current result
<p>>6 Videos;</p>	<p>Video(s) published (as of March 18th, 2024):</p> <ul style="list-style-type: none"> • Experience report on short-term exchange to TU Wien by Ivan Čilić from UNIZG-FER (link) <ul style="list-style-type: none"> ○ published on June 13th, 2023 • Experience report on short-term exchange to TU Berlin by Dora Kreković from UNIZG-FER (link) <ul style="list-style-type: none"> ○ Published on May 13th, 2024 <p>The videos are published on the YouTube channel of the IoTLab and shared on the project website, IoTLab website, and IoTLab Social Media accounts (LinkedIn, Twitter).</p>
<p>>1000 Social Interactions;</p>	<p>The total number of impressions and engagements on posts on our Twitter/X and LinkedIn posts on the 9th of May is:</p> <ul style="list-style-type: none"> • 20319 impressions • 3738 engagements <p>The majority of impression and engagements scores come from the IoTLab@FER LinkedIn page, while Twitter/X page impressions and engagements are at a lower level.</p> <p>Our strategy involves fostering the growth on LinkedIn by consistently sharing updates on project results and activities. More focus will be given to posting on the Twitter/X account when we initiate a targeted campaign promoting technical blog posts being published frequently in a short period of time (approx. every 2 weeks).</p>

<p>>=10 Blog posts;</p>	<p>The first technical blog post titled “<i>Training AI models with VisionKG</i>” written by Jicheng Yuan and Duc Manh Nguyen was published on June 29th 2023 following the hands-on training in Berlin.</p> <p>Technical blogs serve to communicate the project's findings and research topics to a wider community in a more relaxed manner than journal and conference papers. To create technical blog posts, we first need to produce technical results in WP1 that are of interest to the wider audience. We plan to create a series of blog posts based on deliverables D1.1, D1.2 and D1.3 and publish them regularly, e.g. one in two to three weeks, to reach a wider audience, especially on Twitter/X.</p>
<p>>=500 followers on LinkedIn;</p>	<p>On the 22nd of May 2024 the LinkedIn page had 449 followers which is 303 more than in the fall of 2022 (before the project start).</p> <p>The growth of followers is continuous, and the impression and engagement scores note an even more substantial continuous increase.</p>
<p>>=100 followers on Twitter;</p>	<p>On the 9th of May 2024 the IoTLab@FER Twitter page had 38 followers, which is a growth of 90% compared to fall of 2022.</p> <p>The growth of the engagement and impression scores of Twitter/X posts, and therefore of followers, is much slower compared to the LinkedIn account. More attention will be given to Twitter/X which requires continuous and more frequent post publication to attract followers compared to LinkedIn.</p>
<p>>=20 posts yearly on social media</p>	<p>In 2023, 20 social media posts were posted about the AloTwin project on the IoTLab@FER social media accounts:</p> <ul style="list-style-type: none"> • 14 LinkedIn posts • 6 Twitter posts <p>In 2024, as of 22nd of May, 17 posts have been posted about the AloTwin project on the IoTLab@FER social media accounts:</p> <ul style="list-style-type: none"> • 10 LinkedIn posts • 7 Twitter posts
<p>participation in >=3 “open door” events</p>	<p>Participation in the Open Doors Day of UNIZG-FER on November 25, 2023.</p> <ul style="list-style-type: none"> • Report: https://aiotwin.eu/aiotwin/news?@=2yvtb#news_154970

5 Exploitation activities

5.1 Overview of exploitation plan

All institutions involved in the project focus on the non-commercial exploitation of the knowledge gained through the project's networking activities and use it in line with their research practises and institutional missions, e.g., for educational activities and preparation of future projects. The AloTwin exploitation strategy revolves around the following three groups of activities:

- exploitation activities based on know-how exchange (WP2) between the participating partners,

- exploitation activities based on the joint research project (WP1), and
- exploitation activities based on innovation training and preparation of common HE proposals (WP4).

The exchange of know-how among consortium members enhances the knowledge base of all researchers involved in the project, thereby improving the overall quality of each partner institution. This initiative particularly focuses on significantly enhancing the scientific excellence and research output of UNIZG-FER.

5.2 Exploitation results

Deliverable D1.1 (from WP1) presents the current state of the first key exploitable result (ER1: Architecture of the middleware for data-driven orchestration in the cloud/edge/IoT continuum). It defines the use cases, system requirements and architecture of the AloTwin data-driven orchestration middleware, and also contains an analysis of the current state of the art in the field of Artificial Intelligence of Things (AIoT), focusing on three specific research areas: orchestration in the edge-to-cloud continuum, federated and decentralised learning, and robust energy-efficient IoT.

The status of the second key exploitable result (ER2: Middleware for data-driven orchestration in the cloud/edge/IoT continuum) is reported in D1.3, while the project's code repository (<https://github.com/AloTwin>) has been set up and is being continuously updated with the open-source implementation of the AloTwin middleware. It will be developed further during the second phase of the project when the consortium will be able to identify further exploitable results.

In the context of know-how exchange within WP2, three short-term staff exchanges have been concluded, with PhD students from UNIZG-FER visiting TUV, TUB, and RISE, while 2 expert visits have taken place with researchers from RISE and TUV presenting tutorials at UNIZG-FER on selected relevant topics: decentralised data mining and graph representation learning (RISE) and distributed computing continuum systems (TUV). These activities are in line with the exploitation plans of UNIZG-FER as specified in D3.7, that aims this way to raise its academic and research profile, giving the opportunity to its students for extended visits and international collaborations. At the same time, this fruitful exchange is exploited by the other involved partners by means of increased research output as manifested in the planned number of (joint) publications. Moreover, two short-term trainings have been hosted by TUB and RISE, respectively, contributing to knowledge diffusion within the consortium via hands-on sessions on topics including Federated Learning (FL), Knowledge Graphs, and the use of WebAssembly on IoT devices.

In the context of WP4, UNIZG-FER and TUB, have submitted one Horizon Europe project proposal together with external partners. Furthermore, all partners have benefited by participating in the innovation-related trainings that have taken place thus far: (i) session on proposal writing and evaluation of collaborative Horizon Europe projects, during the 1st AloTwin summer school; (ii) 1st AloTwin Research and Innovation Management Training, organised by RISE (https://aiotwin.eu/aiotwin/news?@=2zwr4#news_154970).

Project activities that have led to exploitation results, as the latter are specified in the individual and joint exploitation plans of the partners (see D3.7), are summarised in Table 5.

Table 5 List of exploitation results linked to specific AloTwin project activities.

Activity	Related WPs	Exploitation results with reference to individual or joint exploitation plan	Benefiting partner
Research on AloTwin middleware	WP1	Middleware architecture (ER1), middleware implementation (ER2).	Joint exploitation
Short term staff exchange: Ivan Čilić (host: TUW)	WP1, WP2	Increased mobility for UNIZG-FER PhD students; improved academic profile.	UNIZG-FER
		Increased research output: 1 joint conference paper; 1 joint journal submission in progress.	UNIZG-FER, TUW
Short term staff exchange: Dora Kreković (host: TUB)	WP1, WP2	Increased mobility for UNIZG-FER PhD students; improved academic profile.	UNIZG-FER
		Increased research output: 1 joint journal article submitted, 1 joint conference publication planned.	UNIZG-FER, TUB
Expert visit by Lodovico Glaretta (RISE)	WP2	Strengthened UNIZG-FER's doctoral study programme by means of knowledge transfer to graduate students on decentralised data mining and graph representation learning.	UNIZG-FER
Expert visit by Pantelis Frangoudis and Ilir Murturi (TUW)	WP2	Strengthened UNIZG-FER's doctoral study programme by means of knowledge transfer to graduate students on distributed computing continuum systems.	UNIZG-FER
Short-term training hosted by TUB	WP2	Increased research & innovation expertise: knowledge transfer & hands on experience on Knowledge Graphs, AI Models with VisionKG, and Learning on Edge Devices with the Flower FL framework.	UNIZG-FER, RISE, TUW
Short-term training hosted by RISE	WP2	Increased research & innovation expertise: knowledge transfer & hands on experience on WebAssembly and AI for the IoT.	UNIZG-FER, TUB, TUW
Short-term trainings during the 1st AloTwin summer school	WP2, WP3	Increased research & innovation expertise: knowledge transfer & hands-on experience on FL for IoT Edge Devices by TUB.	UNIZG-FER, RISE, TUW

		Increased research & innovation expertise: knowledge transfer & hands-on experience on tools for SLO-aware service management & orchestration by TUW.	UNIZG-FER, RISE, TUB
Technical tutorials during the 1st AloTwin summer school	WP3	Increased research & innovation expertise: knowledge transfer on IoT protocols (UNIZG-FER), network emulation tools (UNIZG-FER), decentralised graph mining (RISE), orchestration in distributed computing continuum systems (TUW), federated & decentralised learning (RISE).	UNIZG-FER, RISE, TUB, TUW
Tutorial by Ivana Podnar Žarko & Maja Matijašević on proposal writing and evaluation of collaborative Horizon Europe projects during 1st AloTwin summer school	WP3, WP4	Strengthened project preparation and management skills, as well as research management and administrative skills, with a focus on the Horizon Europe programme.	UNIZG-FER, RISE, TUB, TUW
1st AloTwin Research and Innovation Management Training (host: RISE)	WP4	Strengthened project preparation and management skills, as well as research management and administrative skills, with a focus on (i) funding acquisition, (ii) the role and innovation opportunities of open-source software, and (iii) reproducible research.	UNIZG-FER, RISE, TUB, TUW
Preparation and submission of one Horizon Europe project proposal by UNIZG-FER and TUB.	WP4	Increased participation of UNIZG-FER in HE; strengthened project preparation and management skills of senior lab members & research management and administrative skills of UNIZG-FER staff, esp. with regard to the HE program.	UNIZG-FER
		Increased collaboration opportunities by jointly submitting project proposals; strengthened collaboration with other consortium members and promoted utilization & expansion of TUB's outcomes.	UNIZG-FER, TUB

6 Conclusion

This deliverable provides an overview of the AloTwin activities during the period spanning the first 17 months of the project, related to joint paper preparation, conference attendance, and dissemination, communication and exploitation. By executing the project's plan towards promoting networking, visibility, dissemination and exploitation, significant results have been achieved thus far. Already, the initial targets regarding the total number of project publications and conference participation have been met, while we expect that the results of research work carried out in the context of WP1 will ensure achieving AloTwin's joint publication targets during the second half of the project. The performance of the project's communication activities and the level of accomplishment of their measurable targets are closely monitored, demonstrating appropriate use of AloTwin's communication channels. Furthermore, the successful organization of the first AloTwin Summer School has provided significant networking, visibility and dissemination opportunities to the consortium as a whole and UNIZG-FER in particular, while the target for the upcoming summer school is to further strengthen the project's visibility and outreach and foster synergies and collaboration beyond the consortium. Finally, progress has been made in terms of the project's key exploitable results following research work in WP1 (middleware architecture and its open-source implementation). This is reported in more detail in the deliverables of WP1 and complements the exploitation activities related to knowledge exchange and innovation aspects, which are the subjects of WP2 and WP4, respectively.

7 Acronyms

AI	Artificial Intelligence
AIoT	Artificial Intelligence of Things
D&C	Dissemination and Communication
D/C/E	Dissemination/Communication/Exploitation
ER	Exploitable Result
FL	Federated Learning
HE	Horizon Europe
IoT	Internet of Things
KPI	Key Performance Indicator

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