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EXCELSIOR Project

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Author(s):	CUT: Christiana PAPOUTSA, Diofantos HADJIMITSIS ECoE: Marinos ELIADES, Christos THEOCHARIDES, Georgios LEVENTIS, Marina PEKRI, Kyriacos THEMISTOCLEOUS	
Contributor(s):	CUT: Kyriacos NEOCLEOUS ECoE: Marios TZOUVARAS DEC-DMRID: George KOMODROMOS, Stelios TZIORTZIS	
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Document Sign-off				
Nature	Name	Role	Partner	Date
DRAFT	Christiana PAPOUTSA	WP8 Participants	CUT	1/09/2022
	Marinos ELIADES, Christos THEOCHARIDES, Georgios LEVENTIS, Marina PEKRI		ECoE	
REVIEWED	Kyriacos THEMISTOCLEOUS	Project Technical Manager	ECoE	4/09/2022
DRAFT	Christiana PAPOUTSA	WP8 Participant	DRAFT	20/09/2022
REVIEWED	Kyriacos NEOCLEOUS	Quality Assurance	CUT	27/9/2022
APPROVED	Diofantos HADJIMITSIS	Project Coordinator	CUT	30/9/2022

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EXECUTIVE SUMMARY

This deliverable reports the activities that were done with stakeholders to co-design, co-develop, commercialise, and promote EO-based products & services and applications that facilitate the efficient use of EO data for different economic sectors (e.g., tourism, energy, agriculture) up to date.

This deliverable also describes the need for the Eratosthenes Centre of Excellence (ECoE) to set up an industry liaison office (ILO), as the first point of contact for industrial actors in Cyprus, EMMENA and in Europe, for linking and documenting the ECoE with industrial needs, cultivating mutually beneficial relationships with the industry, preparing the ground for cooperation, handling MoUs and contracts and involving the appropriate ECoE and Digital Innovation Hub (DIH) staff towards ECoE income diversification and sustainability.



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Abbreviations and Acronyms

AGFT	AG FUTURA TECHNOLOGII DOOEL SKOPJE
CUT	Cyprus University of Technology
CY	Cyprus
CH	Cultural Heritage
CYTA	Cyprus Telecommunication Authority
CLK	Cellock
DAS	Satellite Ground Receiving Antenna Station
DEC	Department of Electronic Communications
DEC-DMRID	Department of Electronic Communications – Deputy Ministry of Research, Innovation, and Digital Policy
DFKI	Deutsches Forschungszentrum Fur Kunstliche Intelligenz
DIH	Digital Innovation Hub
DLR	Deutsches Zentrum für Luft – und Raumfahrt
ECoE	ERATOSTHENES Centre of Excellence
EMMENA	Eastern Mediterranean, Middle East and North Africa
ESA	European Space Agency
GR	Greece
ILO	Industry Liaison Office
KPI	Key Performance Indicator
LoC	Letter of Commitment
MARDE	Ministry of Agriculture, Rural Development and Environment
MoU	Memorandum of Understanding
NMK	North Macedonia
UNITOV	UNIVERSITA DEGLI STUDI DI ROMA TOR VERGATA
WDD	Water Development Department
WP	Working Package



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1. INTRODUCTION

The Industry Liaison Office (ILO) activities are included in the WP8 “ECoE Digital Innovation Hub”, whose primary objective is to support companies and public organisations to become more competitive concerning their business/production processes, products or services using digital technologies for their digital transformation, bringing the 4th Digital Revolution to Cyprus.

ILO will function to link with cross-fertilisation activities in the industry sector. ILO will benefit from the ERATOSTHENES Networking Platform, which:

- incorporates a rich inventory of regional capacities;
- publishes comprehensive profiles of stakeholders;
- provides a first assessment of countries' EO maturity;
- facilitates potential partnerships between various stakeholders.

The ILO will act as the first point of contact for industrial actors in Cyprus, EMMENA and in Europe, for linking and documenting the ECoE with industrial needs, cultivating mutually beneficial relationships with the industry, preparing the ground for cooperation, handling MoUs and contracts and involving the appropriate ECoE and DIH staff towards ECoE income diversification and sustainability. Furthermore, the consultation meetings of the liaison office will be coordinated in close collaboration with the WP9 communication, engagement and networking activities to promote available services and applications that the ECoE can develop for several stakeholders.

Finally, the Liaison office will make the necessary actions to promote ECoE's services in the EMMENA region and Europe, preparing the ground for cooperation toward ECoE income diversification and sustainability through different networks.

The report is structured as follows:

Chapter 2 describes the role, the main activities, and the goals of the liaison office

Chapter 3 provides detailed descriptions of the fundamental principles for the development, delivery of research, innovation, and promotion of the ECoE

Chapter 4 focuses on the contribution of the liaison office to the ECoE strategy for income diversification, open innovation, and positioning in the EMMENA region

Chapter 5 identifies the activities of the liaison office and the stakeholder meetings that took place up to month 36 of the project

Chapter 6 presents the list of services and applications that the ECoE can provide to public authorities and industry stakeholders

Chapter 7 shows the success story of opportunities in a matured state under ILO's active involvement.

Chapter 8 concludes the document.



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2. LIAISON OFFICE

The Industry Liaison Office (ILO) of the ECoE acts as a bridge linking the ERATOSTHENES Centre of Excellence, with industrial actors in Cyprus, EMMENA and in Europe, for linking and documenting the ECoE with industrial needs, cultivating mutually beneficial relationships with the industry, preparing the ground for cooperation, handling MoUs and contracts and involving the appropriate ECoE and DIH staff towards ECoE income diversification and sustainability.

The ILO also aims to serve as a base for creating new industries and businesses while further implementing interdisciplinary joint projects between industry, government and academia. In addition, by coordinating and integrating all the functions and activities of the Centre, the ILO provides a framework that offers various services to the public, such as advice on technologies and research and management consultation. The ILO shares the latest news and information about technology exchange and starting a business, possible partners for business and research to the leaders of each thematic cluster of the Eratosthenes Centre of Excellence.

Based on the strategic plan approved by the Board of Directors and the Excelsior PMSC, the ILO is responsible for finding the approach and appropriate industrial partners for collaboration. It is essential to highlight that the CUT & ECoE have already established a stakeholder hub of more than 600 stakeholders from industry, government, and academia. Indeed, the liaison officer can assist the ECoE Staff in finding the appropriate partner for tenders and contracts.

Within the DIH, the ILO will function to link with cross-fertilisation activities in the industry sector. The consultation meetings of the liaison office will be coordinated in close collaboration with the WP9 communication, engagement, and networking activities.

Moreover, the ILO and the Liaison Officer have the responsibility for the following activities:

- Promote the co-design and co-develop processes within the ECoE
- Make all the necessary actions for signing MOUs with industrial partners
- Expand new collaborations with key stakeholders from the industry for future contracts tenders and products
- Organize meetings, workshops and events with the primary aim of finding and approaching new partners for collaboration.
- Participate in international industrial fairs and forums
- Perform technology assessments to determine the commercial potential for inventions,
- Create promotional materials to highlight the researcher's expertise
- Identify key industry partners to sponsor research activities,
- Draft and negotiate research agreements on behalf of researchers,
- Act as the first contact point for inviting industrial partners in project consortiums, funding schemes and tenders.
- Collaborate with the key management staff of ECoE.
- Provide the opportunity to the staff to search for an industrial or research partner, funding, or investor through the DIH platforms.



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It is essential to highlight that an Enterprise Liaison Office of the Cyprus University of Technology (<https://www.liaisonoffices.ac.cy/>) was formed in 2011 as a European Social Fund project with a critical role within the University's strategic plan for promoting synergies between the business world and the academic community. The aim is to develop and establish a structured network to provide the University's academic and student community and the regional business sector with a partnering platform, enabling both sides to explore effective mechanisms for transferring specialised know-how in research, technology and innovation. Furthermore, the office supports the University's vision of enhancing students' and graduates' employability and employment opportunities through a specific placement framework and advising support services emphasising soft skills, entrepreneurship and innovation. The CUT and the ECoE Staff had the opportunity to come across the Enterprise Liaison Office at CUT and other Offices that participated in this Enterprise Liaison Offices funded project during the Excelsior Project to support the establishment of the ECoE's ILO. The knowledge gained from the Enterprise Liaison Office of CUT has assisted ILO to develop the framework for ECoE Industry Liaison Office.



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3. CO-DESIGN AND CO-DEVELOP

One of the main activities of the liaison office is to engage the existing staff of the EXCELSIOR project and the ECoE to approach the industry stakeholders and implement co-design and co-develop processes to reach the commercialisation of products.

Based on the research-based design method, co-design is an approach that uses research to determine how to come up with the greatest tool or artefact possible. The goal of the design process is not just the creation of an artefact but also a change within the given environment. Achieving such a shift may not always be possible, but doing it effectively necessitates an iterative design approach. (Pejoska et al. 2017) ¹

- The initial step in the process is **contextual inquiry**. It is necessary to know whom the design is for, what it is intended to accomplish, what the design's sociocultural context is, and what trends it is associated with.
- Although the term "**participatory design**" refers to many different methods, it is here defined as the phase in which stakeholders provide the most input. Engaging methods are used to solicit feedback, such as co-design workshops, co-created scenarios, and low-tech prototypes.
- The outcomes of the earlier phases are **transformed into interaction models** and information architecture during the product design phase, which places some distance between the stakeholders. Rough prototypes and use cases are developed.
- The **prototype as hypothesis phase** is when working prototypes are made public and tested in the intended setting to see if they can address the problems the design process is trying to solve. The prototype's viability as a remedy for actual problems has been tested in the crucial phase of field tests carried out at workplaces. Even while the stages of the design process might be thought of as linear, they overlap; thus, it may sometimes be essential to go back and revisit earlier phases. (Leinonen et al. 2014)²

In order to direct the design process, **co-creation or co-develop** is the practice of working with other stakeholders. In facilitated workshops, participants with different roles align and provide various insights. As a result, designers can have a more comprehensive understanding of what should be included in a good or service. Co-creation is primarily about participant alignment and cross-pollination of knowledge and perspectives. The most apparent insights can be gathered, and

¹ Pejoska, Jana, Sanna Reponen, Marjo Virnes, and Teemu Leinonen. 2017. "Mobile Augmented Communication for Remote Collaboration in a Physical Work Context." *Australasian Journal of Educational Technology* 33 (November). <https://doi.org/10.14742/ajet.3622>.

² Leinonen, Teemu, Anna Keune, Marjaana Veermans, and Tarmo Toikkanen. 2014. "Mobile Apps for Reflection in Learning: A Design Research in K-12 Education." *British Journal of Educational Technology* 47 (November). <https://doi.org/10.1111/bjet.12224>.



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progressive collaboration with stakeholders and others can be achieved through a highly interactive agile approach. Co-creation goes further than user research; by making the most of a service design culture involves companies creating a setting where design teams and stakeholders can freely interact, reach consensus, and execute a core strategy congruently. (Lopera-Molano et al. 2020)³ (OHern and Rindfleisch 2010)⁴

Stakeholder engagement highlighted the need for co-creation of knowledge and co-delivery outcomes with economic, industrial and research actors, public authorities and/or civil society. In response, the Excelsior Project has included **co-design, co-develop and co-dissemination** as critical principles for the development and delivery of research and innovation to promote the Centre of Excellence through new contracts, projects and services.

- **Co-design** is one of the critical elements the ILO at the ECoE will adopt. It consists of the participatory design of a new project, mainly consisting of tender, contract, application or research project with stakeholders. Co-design is the first phase of the co-develop or co-production process, in which researchers and non-academic partners jointly develop the research project or a new project or tender or service or a new application and define research and innovation questions that meet their collective interests and needs.
- **Co-develop or Co-Creat**e is the participatory development and implementation of the Excelsior project with stakeholders. This uses practice-orientated research, co-producing the research and case studies through an iterative process that helps to translate the research into practical and usable information or knowledge.
- **Co-delivery / Co-dissemination** is the participatory design and implementation of strategies for appropriate research use, including the joint delivery of research outputs and exploitation of results.

³ Lopera-Molano, Daniel, and Angela María Lopera-Molano. 2020. "Designing Communities in Peace: Participatory Action-Research Approaches Embedded in Regional Education in Colombia." *Gateways: International Journal of Community Research and Engagement* 13 (1). <https://doi.org/10.5130/ijcre.v13i1.7167>.

⁴ OHern, Matthew, and Aric Rindfleisch. 2010. "Customer Co-Creation: A Typology and Research Agenda." In *Review of Marketing Research*, 6:84–106. [https://doi.org/10.1108/S1548-6435\(2009\)0000006008](https://doi.org/10.1108/S1548-6435(2009)0000006008).



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4. CONTRIBUTION OF THE LIAISON OFFICE TO THE ECOE STRATEGY FOR INCOME DIVERSIFICATION, OPEN INNOVATION AND POSITIONING IN THE EMMENA REGION

One of the main tasks of the ILO is to contribute to the ECoE strategy for income diversification, open innovation and positioning in the EMMENA region. The EXCELSIOR strategy for income diversification and open innovation refers to the following points:

1. Research Competence Centers

- based on EXCELSIOR partners profile, enlargement of skilled, mobile, innovative science staff, building unique observational capacities, and establishing an international partner network
- ### 2. Digital Innovation Hub as an Open Science – Open Innovation paradigm through co-exploitation business models and building upon partnering with stakeholders and markets in EMMENA:
- Stimulating market-oriented activities and entrepreneurship
 - Providing state-of-the-art know-how
 - Exploiting the IP, tools, and patented solutions developed at ECoE

3. Uptake User-centric solutions through co-designing and co-creation

- Innovative EO-based products & services and applications to address priorities of economic & societal sectors such as energy, resilient societies and businesses, water management, climate change, transport, tourism, agriculture

4. Development of unique infrastructure for the region

- Satellite Data Receiving Station
- Labs and measurement systems (CAL/VAL, standardization)

The ILO considered the income diversification plan, as shown in Figure 1, as the basis of existing and future activities. The Liaison officer provided all the necessary information and links to the ECoE management and research staff to meet the proposed funding sources as described at the figure below. Further to the acquisition of funding schemes within the Centre as described in chapter 6, the liaison office had the opportunity to discuss with the key partners such as CYTA, CYRIC, GRAVITY, CELLOCK and identify possible ways of future collaboration.



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Income diversification plan

20% Industry & exploitation of services



- **Services** to the industry using alliances with key partners (CYTA, Cyric, Gravity,
- **Leasing infrastructure** to 3rd parties
- **Licensing of IP**
- Entrepreneurship (*spin-offs - royalties*)
- Consulting and digital services **start-ups**



30 % EC projects



- (1) H2020, H2030 (FP10), (2) MED: territorial cohesion and environmental protection, sustainable development. (3) LIFE+ (4) ECHO: Humanitarian Aid & Civil Protection (5) INTERREG EUROPE (6) PRIMA CALLS: from 2018 to 2028

20 % EMMENA projects



- Projects with EMMENA countries through local government and EC&IFIs funding (e.g. ENI, Euro-Mediterranean cooperation , IFIs rehabilitation activities and development projects)
- Privileged access to untapped market opportunities in EMMENA due to: Cyprus location, access to EMMENA EO network and action plans through GEO-CRADLE's market analysis in areas: Food , Energy, Climate Change, Access to Raw materials;



15 % National Projects



- Cyprus Research Innovation Foundation, Structural Funds, Ministry of Commerce , Public/Private sector in support to National Smart Specialisation Strategy in Cyprus



15 % ESA, GEO, Copernicus



- ESA: By 2022, Cyprus will become a full ESA member state, exploiting ESA funds.
- Copernicus cross-cutting & cross sector services (e.g. agriculture, energy)
- GEO, GEOSS and EUROGEOSS opportunities, UN SDGs & Sendai Framework actions



Figure 1: Income diversification plan



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5. ACTIVITIES AND MEETINGS WITH STAKEHOLDERS

During the Excelsior Project, several activities were undertaken to establish and operate the Liaison Office (Figure 2). Within the first 36 months of the EXCELSIOR project, the ILO performed several actions to engage industrial actors with the primary aim to co-design, co-develop, commercialise and promote EO-based products & services and applications. Such activities include physical or online meetings, preparatory activities for signing MOUs, identifying new key partners for tenders, projects and services, participating in events/workshops and seminars, etc. The stakeholders' meetings were held strategically to gain commitment and define usability objectives based on their business objectives and needs. The meetings listed below helped to gain a more in-depth understanding of the ideas and concerns parties (citizens, companies, associations etc.) that might have on a given issue. Making contact helps to break down barriers that might have prevented fruitful cooperation and certainly affect the development of suitable ECoE products, tools and services to answer their market needs. With a considerable number of stakeholders, the ECoE team also actively wrote proposals that led to the development of such tools/services. Additionally, the liaison officer also used the dissemination tools of the EXCELSIOR project, including brochures, communication tools, and social media to promote the ECoE activities.



Figure 2: Overall activities of the ECoE ILO.

As shown in Figure 2, the ILO held 69 online meetings with industrial partners for a possible collaboration (Table 1), 30 online meetings with new partners for possible collaboration from the Government, signed MOUs with 11 industrial partners (Table 2), attended 10 workshops/seminars,



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held 30 Internal meetings with the Excelsior staff at CUT & ECoE and drafted 9 new services and ideas.

Table 1: Industrial partners for a possible collaboration

#	NAME	COUNTRY
1	CELLOCK LTD	Cyprus
2	CYRIC LTD	Cyprus
3	MARATHON SYSTEMS	Greece
4	CYTA	Cyprus
5	NOVATEX LTD	Cyprus
6	ARATOS	Greece
7	PLANETEK	Greece/Italy
8	Spin Life srl	Italy
9	Piante Acqua Natura srl	Italy
10	SQLI Services	Tunisia
11	L.D. TECHNOLOGIES LTD	Cyprus
12	Geofem	Cyprus
13	Norwegian Geotechnical Institute	Norway
14	Atlantis Consulting	Cyprus
15	VVA Brussels Sprl	Belgium
16	AGRI-CIÊNCIA - Consultores de Engenharia	Portugal
17	Telespazio Italia	Italy
18	E-GEOS SPA (AFFILIATED ENTITY of TPZIT)	Italy
19	TerraSphere Imaging & GIS B.V.	Netherlands
20	POBAR Servicios Agrícolas, S.L.	Spain
21	Telespazio France	France
22	Graphics Vision	Germany
23	farmB digitising agriculture	Greece
24	Steinbeis Europa Zentrum / Steinbeis 2i GmbH	Germany
25	Lottozero società cooperativa sociale	Italy
26	Anagnorisis Institute of Media Management LTD	Cyprus
27	Ianus Consulting Ltd	Cyprus
28	Telesto Technologies Pliroforikis Kai Epikoinonion Epe	Greece
29	Zentrum Fur Risiko- Und Krisenmanagement	Austria
30	T4i Engineering Single Member Private Company	Greece
31	Geospatial Information Technologies P.c.	Greece
32	Signalgenerix Limited	Cyprus
33	Prepared International UG	Germany



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#	NAME	COUNTRY
34	Anysolution SL	Spain
35	Imaginary SRL	Italy
36	IDEMIA Identity & Security France	France
37	Future Intelligence Ltd	UK
38	K3Y	Bulgaria
39	Balearia Eurolineas Maritimas SA	Spain
40	iSolutions LLC	Ukraine
41	Thales DIS SRO	Czech Republic
42	Terra Marine	Greece
43	AegeanSolutions	Greece
44	IN2IT	Italy
45	Cyprus Digital Innovation Hub LTD	Cyprus
46	RTD Talos Limited	Cyprus
47	GrantExpert Consulting Limited	Cyprus
48	Cyprus Business Angels Network Ltd	Cyprus
49	Educational Excellence Corporation	Cyprus
50	Cyprus Blockchain Technologies LTD	Cyprus
51	Gravity Ventures LTD	Cyprus
52	Computer Resources International Group	Belgium
53	Geosystems Hellas	Greece
54	MILITOS SYMVOULEUTIKI A.E.	Greece
55	COGNITERA S.A.	Greece
56	KOOLMILL Systems Limited	UK
57	NOVEL GROUP SARL	Luxembourg
58	PyroGenesys	UK
59	STRATAGEM Energy Ltd	Cyprus
60	SENSEEN	France
61	GREENHOUSE Ventures Ltd	Cameroon
62	Biome Makers Spain S.L.	Spain
63	REM Analytics SA	Switzerland
64	SCIENTACT AE	Greece
65	AgFutura Technologies	North Macedonia
66	Regia-Douro Park - Parque de Ciência e Tecnologia	Portugal
67	Águas do Norte, S.A	Portugal
68	Software Imagination & Vision SRL	Romania
69	Viile Budureasca SRL	Romania



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- **30 online meetings with new partners for possible collaboration from the Government**

These meeting included partners such as the Water Development Department, Geological Survey Department, Department of Agriculture, Department of Forests, Department of Environment, Agriculture Research Institute, Department of Antiquities, Cyprus Agriculture Payment Organisation, etc.

- **MOUs with 11 industrial partners (Table 2)**

The liaison officer initiated the processes for the signing of the MOUs with the industrial partners:

Table 2: MOUs with Industrial partners

#	Name	Type	Country	Date
1	Limassol Chamber of Commerce and Industry	Private entity	Cyprus	05/04/2021
2	Norwegian Geotechnical Institute	Private entity	Norway	10/05/2021
3	Cyprus Research and Innovation Center Ltd	Private entity	Cyprus	10/05/2021
4	AI MOTUS Ltd	Private entity	Cyprus	14/05/2021
5	CELLOCK LTD	Private entity	Cyprus	14/05/2021
6	Geofem	Private entity	Cyprus	27/07/2021
7	T.C. Geomatic Ltd	Private entity	Cyprus	28/02/2022
8	NOVATEX SOLUTIONS LTD	Private entity	Cyprus	28/02/2022
9	ECECT - EUROPEAN CENTRE FOR EMERGING COMPETENCIES AND TECHNOLOGIES	Private entity	Cyprus	28/02/2022
10	CERIDES - Centre of Excellence in Risk & Decision Sciences, European University, Cyprus	Private entity	Cyprus	08/03/2022
11	ARATOS Systems BV	Private entity	Greece	08/06/2022
12	ARATOS SPACE P.C.	Private entity	Greece	08/06/2022
13	CMMI – Cyprus Marine & Maritime Institute	Private entity	Cyprus	15/07/2022
14	ATLANTIS	Private entity	Cyprus	20/07/2022
15	CYTA - Cyprus Telecommunications Authority	Private entity	Cyprus	22/09/2022

The liaison officer performed different preparatory activities for signing more MOUs.

- **Attending 10 workshops/seminars**

Among these workshops, the following are included:

- ESA PECS Workshop May 2022 in Cyprus (organised by DEC), participation from industry (> 80 companies)
- Cyprus Space Info Day 2022 September 2022 in Cyprus (organised by DEC), participation from industry (> 80 companies)
- EARSEL Symposium September 2022 (organised by ECoE)
- International workshops (as described in the other submitted deliverables)



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- **30 Internal meetings with the Excelsior staff at CUT & ECoE**

The ILO had several meetings with administrators and project managers to advance the excellence in research. It also had direct meetings with the Chambers of Commerce and Industry, Cyprus Association of Research and Innovation Enterprises. As well, the ILO also had six direct meetings with the Cyprus Chamber of Commerce and Industry (CCI) and Cyprus Employers and Industrialists Federation (OEB).

- **Drafting 9 new services and ideas (See chapter 6)**

The following indicative list of meetings and presentations, as shown in Table 3, presents some actions in which the Liaison office either initiates or contributes.

Table 3: Activities in which the ILO either initiates or contributes



12 October 2021

Meeting with Cyprus Shipping Deputy Ministry



14 October 2021

Meeting with Deputy Minister of Cyprus and Greece



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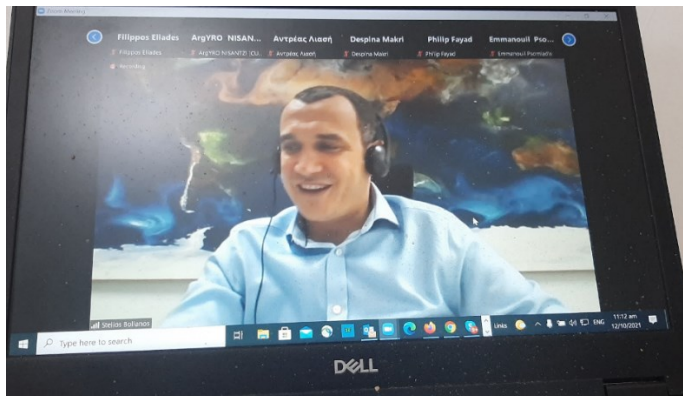


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27 October 2021

Meeting with CAPO, NOVATEX, CELOCK



October 2022

Meeting with Stelios BOLLANOS - PLANETEK



17 December 2021

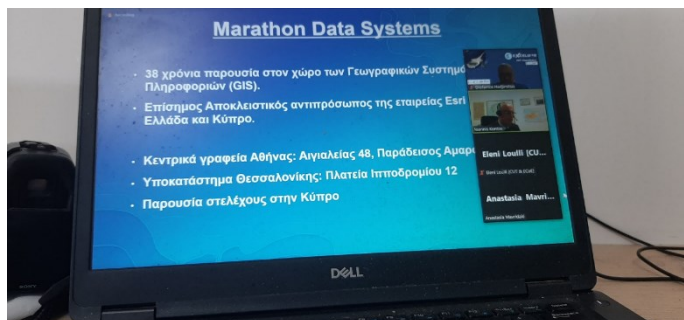
Thal Chor /Meeting with the University Of Aegean (MoU is undersigning)



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November 2021

Meeting with Marathon Data Systems



16 November 2021

Meeting with Peyeia Municipality



December 2021

Meeting with Axilleas KENTONIS and Asterosxolio/Planetarium

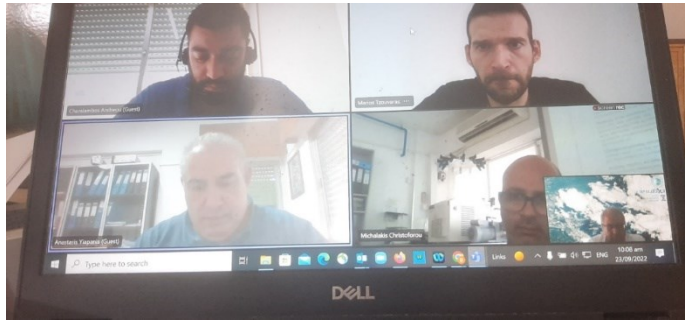




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December 2021

Meeting with Panagrotikos



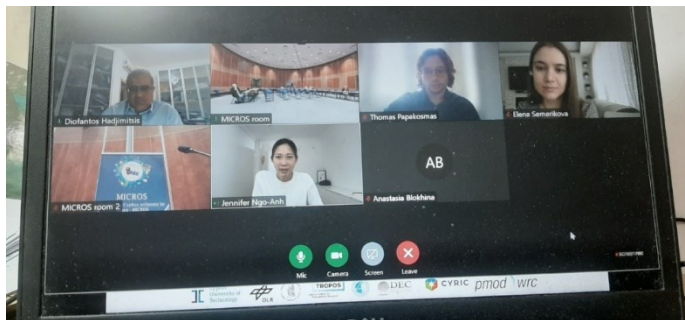
14 April 2022

Meeting with Paphos Marine Spatial Plans to Municipalities & Stakeholders.



April 2022

Meeting with CYRIC



May 2022

Online Presentation Future Services/Applications for Space from ECoE



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May 2022

Meeting with Department of Environment



May 2022

Online Presentation with MICROS - Future Services/Applications for Space from ECoE



May 2022

The Liaison Office contributed in collaboration with the Business Development Manager in the initiative of the Centre with CYRIC to be an associated member of the European Business and Innovation Centre Network



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3 May 2022

Meeting with FOSS UCY (physical presence)



10 May 2022

Meeting for ESA PECS. To address the development of tools and products to over 50 stakeholders that attended



June 2022

Geophysical Survey in Paphos Municipality



June 2022

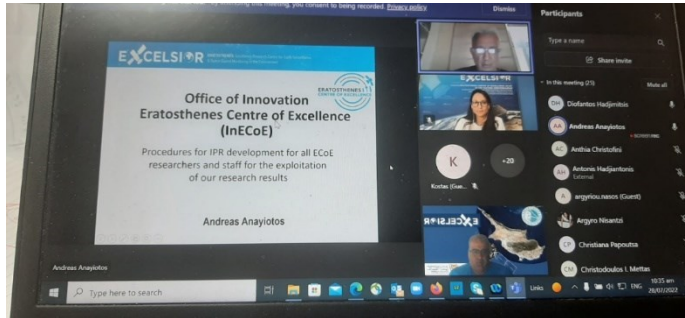
Meeting With Aratos (agriculture)



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July 2022

IPR Research for the future ECoE business development products, meeting with Raftis.



July 2022

Meeting with Anaptixiaki Pafou & Polis Chrysochous



27 September 2022

Meeting with the Shipping Deputy Ministry and signing a contract





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6. LIST OF SERVICES, APPLICATIONS AND NEW IDEAS

The ILO promotes the co-design process to all the CUT/ECOE Staff by linking them directly with key governmental departments in Cyprus as well as some vital industrial companies. The following services and applications are those that have been drafted and possible collaborators in industry, government and non-governmental organizations:

6.1 Drafted Services and Applications

Carbon footprint:

Calculating gas emissions from crop fertilisation during the production stage and using Earth Observation to measure the carbon footprint before the certification process.

Industry: Cellock Ltd, Scientast Sa, Foodscale Hub Greece Association for Entrepreneurship and Innovation Astiki Mi Kerdoskopiki Etaireia, Diabalkaniko Kentro Periballontos, Ag Futura Technologii Doel Skopje,

Government: Hellenic Ministry of Environment Energy and Climate Change, Ministry of Agriculture, Rural Development And Environment Of Cyprus, Hellenic Accreditation System, Department of Agriculture, Cyprus Agricultural Payments Organisation, Agricultural Research Institute, Department of Environment

Non-governmental organisations: Panagrotikos Syndesmos Kyprou Somateio, Zdruzenie Platforma Za Zelen Razvoj Skopje, Agencija Za Potiiknuvanje Na Razvojot Na Zemjodelstvoto, Goce Delcev University Ugd, Technologiko Panepistimio Kyprou

Food Security / Yield production:

The use of Earth Observation for monitoring the existing crop yield for food security purposes and goods sufficiency, also based on the use of economic indices

Industry: CELLOCK LTD, ATLANTIS, Farmers

Government: Department of Agriculture, Department of Environment, Agricultural Research Institute

Crop diseases:

Early detection of crop diseases using satellite remote sensing analysis.

Industry: Farmers

Government: Department of Agriculture, Department of Environment, Department of Forests

Non-governmental organisations: Panagrotikos Syndesmos Kyprou Somateio

Smart irrigation management:

Provision of information obtained through remote sensing for the efficient irrigation of various types of crops to improve crop yield and minimise, at the same time, the amount of water used by farmers for irrigation purposes.



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Industry: SignalGenerIX, CELLOCK LTD, CyRIC

Government: Agricultural Research Institute, Department of Agriculture, Department of Forests, Department of Environment

Non-governmental organisations: Panagrotikos Syndesmos Kyprou Somateio

Crop classification:

Classification of arable and permanent crops that are eligible for subsidies through CAPO's payment schemes, using satellite remote sensing and UAVs to minimise on-the-spot checks of farmers' applications by CAPO's personnel and facilitate the correct calculation of payments.

Government: Cyprus Agricultural Payments Organisation, Department of Agriculture

Development of Land Use/Land Cover data theme:

Classification of Land Use/Land Cover (LULC) using satellite remote sensing and UAVs for the development of the national LULC data theme, which can be updated on request, that will act as the base for the needs of the new Cartographic Database for the creation a New National Maps Series for Cyprus. The Use of Earth Observation can assist the Town Planning Department to revise the local plans based on LULC data.

Government: Department of Lands and Surveys, Department of Town Planning and Housing

Detection of water leakages:

Satellite image processing, through the application of several indices, for the timely detection of water leakages to the pipe network of the WDD, minimising rehabilitation costs and water loss.

Industry: Farmers

Government: Water Development Department, Department of Environment, Department of Agriculture, Municipalities

Coastal erosion monitoring:

Monitoring coastal erosion by water that often occurs in Cyprus through satellite remote sensing and UAVs. Various methodologies/models (RUSLE, SIMWE, etc.) combining remote sensing and in-situ data and Geographic Information Systems (GIS) will be used to develop coastal erosion risk zones for the timely provision of information to relevant authorities.

Government: Department of Town Planning and Housing, Municipalities, Cyprus Civil Defence

Alerts for pre- & post- fire events:

Detection of pre-cursors of forest fires, through satellite remote sensing, for the early warning of upcoming fire events and assessing the impact of fires, providing valuable information to first responders, rehabilitation authorities and the public.

Government: Department of Forests, Cyprus Civil Defence, Department of Environment, Municipalities, Department of Agriculture, Department of Lands and Surveys, Department of Town Planning and Housing,



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Monitoring atmosphere/dust

Satellite remote sensing and the PollyXT LiDAR (and other relevant equipment) will be used to monitor and measure the air quality, dust transport, and cloud properties over Cyprus and beyond. This will assist in detecting cases that can be hazardous to public health, such as extreme dust events, high concentrations of CO₂, etc.

Government: Ministry of Health, Department of Environment, Department of Meteorology, Department of Labour Inspection, Municipalities, Cyprus Civil Defence

Monitoring of Landslides:

Provision of timely critical information regarding upcoming landslide events to first and second responders (CCD) and the public to save human lives and landslide impact assessment outputs for rehabilitation authorities. Development of landslide risk maps to enable the Geological Survey Department to monitor areas of high risk and the Department of Town Planning and Housing to update their building permission zones and adopt preventive measures.

Government: Geological Survey Department, Cyprus Civil Defence, Department of Town Planning and Housing

Preservation of Cultural Heritage:

Development of true digital copies of ecclesiastical monuments and other areas of Cultural Heritage interest through the use of UAVs, geodetic instrumentation, such as GNSS, laser scanners etc., and specialised camera systems.

Government: Department of Antiquities

Maritime surveillance and border control:

Monitoring the sea area around Cyprus through satellite remote sensing techniques using optical and SAR satellite imagery and case-specific algorithms for detecting illegal activities, refugees, etc.

Possible collaborators:

Government: Ministry of Defence, Ministry of Interior, Shipping Deputy Ministry

Smart Cities:

The use of GIS and Earth Observation can be integrated with other intelligent techniques for planning smart cities, especially on the aspect of providing essential data, such as Land Use/Land Cover, utilities, road networks, etc.

Government: Department of Town Planning and Housing, Municipalities, Department of Lands and Surveys

6.2 New ideas in Collaboration with Industry

The ILO has been instrumental in bringing together ECoE with industry in order to collaborate for new initiatives, project proposals and future development. Following up the signature of the MOU between ECoE and CELLOCK LTD, a lot of concepts were discussed, including the formulation of products that ECoE with CELLOCK can work together for research, design, implement and eventually



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commercialize under the auspices of the ILO. Cross-functional teams from ECoE and CELLOCK worked together systematically to deliver value efficiently and effectively. Using methodologies such as brainstorming sessions, focus groups, market research and SWOT analysis, helped to drive success by providing a clear set of guidelines for how work will get done.

Several steps were taken to define a methodology for collaboration in order to create value and transform ideas from TRL1 level to final product by using ECoE and industry such as Cellock to co-develop and co-design to create a competitive advantage. The following categories have identified that related with Earth Observation (EO) capabilities: Water quality, Air pollution, Coastal pollution – oil spills, Agriculture, Urban Heat, Landslides, Digital Twin, Border Security, Forest Fires, Natural Hazards (Landslides, Fires, Erosion, Floods), Cultural Heritage, Artificial Intelligence, Border security, etc. Cellock also will be able to provide a cutting-edge approach in terms of EO data analysis and artificial intelligence. AI for ERATOSTHENES Centre of Excellence will be crucial to help extract information from observations, enhance analytic and forecast capabilities, and turn them into tailor-made products and services for end users, stakeholders, and the public. This initiative led to the collaboration in submitting a Twinning proposal that was selected for funding (AI-Observer; section 7).

Another industry partner that collaborated with ECoE through the ILO is the Cyprus Telecommunication Authority (CYTA). CYTA is one of the key strategic partners of the ECoE that provided an LoC to host a satellite ground receiving station (DAS) at its premises. Indeed, the liaison officer made all the necessary arrangements in collaboration with the procurement officer and DLR for planning and designing services using the DAS data.



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7. OPPORTUNITIES THAT HAVE PROGRESSED TO A MATURE STAGE

The ILO initiated direct collaboration in funding schemes aiming to promote the co-development of new products, tools and services in Cyprus, the EMMENA region and abroad. The prominent involvement of the ILO was in networking with the partners of each proposal, the co-design of how to draft the proposals and forming consortia by considering each partner's expertise. Fourteen project proposals received funding and secured 2.6 million euros for ECoE, as indicated in Table 4.

Table 4: Funding project proposals

#	Funding source	Call	Project acronym	Project title	ECoE budget (€)	Total budget (€)
1	Research and Innovation Foundation	Excellence Hubs EXCELLENCE/042 1	MIGRATE	Modelling Demography and Adaptation in the Initial Peopling of the Eastern Mediterranean Islandscape	2,889.60	119,999.60
2	PRIMA	PRIMA Call-2021-Section 2 RIA & IA	AGREEMAR	Adaptive agreements on benefits sharing for managed aquifer recharge in the Mediterranean region	174,500	1,100,000
3	ESA	5th ESA-PECS call	EDAFOS	Development and testing of desertification risk and pressures mapping and Assessment tool	63,209	160,717
4	COST	COST Action	HARMONIA	International network for harmonisation of atmospheric aerosol retrievals from ground-based photometers	Budget for meetings	Budget for meetings
5	Horizon Europe	Twinning (HORIZON-WIDERA-2021-ACCESS-03)	AI-OBSERVER	Enhancing Earth Observation capabilities of the Eratosthenes Centre of	615,653	1,489,379



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#	Funding source	Call	Project acronym	Project title	ECoE budget (€)	Total budget (€)
				Excellence on Disaster Risk Reduction through Artificial Intelligence		
6	Horizon Europe	Twinning (HORIZON-WIDERA-2021-ACCESS-03)	ENGINEER	CIVIL ENGINEERING AND GEOMATICS INNOVATIVE RESEARCH ON HERITAGE	132,500	1,500,000
7	Horizon Europe	HORIZON-WIDERA-2022-ACCESS-04-01	CARBONICA	Carbon Initiative for Climate-resilient Agriculture	674,000	4,985,250
8	Horizon Europe	HORIZON-CL2-2022-HERITAGE-01-08	TRIQUETRA	Toolbox for assessing and mitigating Climate Change risks and natural hazards threatening cultural heritage	300,188	3,991,122
9	Horizon Europe	HORIZON-CL2-2022-HERITAGE-01-07	ENIGMA	ENDORISING SAFEGUARDING, PROTECTION, AND PROVENANCE MANAGEMENT OF CULTURAL HERITAGE	383,750	3,993,500
10	Research and Innovation Foundation	CODEVELOP-GT/0322	GreenCarbon CY	Transitioning to Green agriculture by assessing and mitigating Carbon emissions from agricultural soils in Cyprus	270,600	599,550
11	Research and Innovation Foundation	CODEVELOP-ICT-HEALTH/0322/	Green-HIT	A Green - Holistic IoT platform for Forest Management and Monitoring	65,280	599,851.36
				TOTAL	2,682,569.60	18,519,368.96



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7.1 Activities with Industry for Proposals

Some of the significant achievements due to the actions of the ILO to strengthen collaboration between ECoE and other stakeholders, commercialise the ECoE services and products and towards ECoE income diversification and sustainability will be described in the following lines.

On October 2021, the ILO office arranged meetings between ECoE, Cellock and the Pancyprian Farmers Union to discuss the issue of the rising greenhouse gas (GHG) emissions by agriculture and to explore ways to use Earth Observation for measuring the carbon footprint of agriculture. ILO strengthened this initiative further by identifying potential partnerships from Cyprus and abroad. A consortium of 14 partners from Cyprus (CY), Greece (GR) and North Macedonia (NMK) was formed. This fruitful collaboration resulted in the "Carbon Initiative for Climate-resilient Agriculture (**CARBONICA**)" project, which received funding under the framework of the Horizon Europe Programme, Call Excellence Hubs (HORIZON-WIDERA-2022-ACCESS-04), on March 2022. The project's budget is 5 million euros, from which ECoE will receive 640000 euros. The developed innovative solutions of the project will be accompanied by business and investment plans to ensure that the project results will be further developed into close-to-market solutions and that the established cross-border collaboration links and initiatives fostering regional innovation excellence will be sustained after the end of the project.

Several meetings took place between the ECoE's liaison officer and IBEC, Panagrotikos, Ministry of Agriculture, PEK, and individual farmers to set a common ground for understanding the carbon cycle disruption due to greenhouse gas (GHG) emissions. A dedicated proposal (**GreenCarbonCY**) was submitted along with two research organisations, ECoE and i-BEC, from Cyprus and Greece, respectively, with significant research capacity in agriculture, Earth Observation, behavioural research, social sciences and humanities; 2 industrial partners, CLK and AGFT, from Cyprus and North Macedonia respectively, which can demonstrate expert knowledge in carbon farming and soil restoration solutions, state-of-the-art industrial processes, product development, research and innovation; and one public authority from Cyprus, ARI of the Ministry of Agriculture, Rural Development and Environment (MARDE) with vast experience in advisory services, knowledge transfer, technologies and innovation in agricultural management, policy making, communication and dissemination, and are in close collaboration with farmer associations and other agriculture-oriented stakeholders. Through this proposal, the Liaison officer and the ECoE team aim to develop an integrated and web-based decision support tool for monitoring CO₂ emissions and evaluating energy efficiency and circular economy impacts in Cypriot agroecosystems.

Responding to the constant technological advances and needs that those technologies (like AI) are called to answer, ECoE's liaison officer initiated contacts and meetings (either physical or virtual) with industrial partners and a few governments to establish their organisations' interest in AI-related initiatives as AI is one of the missing core areas that need to be integrated into the EO capabilities of the ERATOSTHENES Centre of Excellence (ECoE) and the vital industrial partners (DEUTSCHES FORSCHUNGSZENTRUM FUR KUNSTLICHE INTELLIGENZ GMBH from Germany, UNIVERSITA DEGLI STUDI DI ROMA TOR VERGATA from Italy and CELLOCK LTD from Cyprus). After these meetings, a fruitful ground for collaboration was found for the drafting, submission and finally, the successful funding of the **AI-Observer** proposal; a twinning proposal that has an



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educational purpose, where training and workshops will be realised to advance and facilitate the incorporation of the AI to the ECoE and thus to the other stakeholders. Through Twinning, AI-OBSERVER aims to significantly improve the scientific and innovation capacity of the ECoE on AI for EO. The research management and administrative skills, through knowledge transfer activities by DFKI and UNITOV, increase the mobility of researchers to and from the advanced partners and exploit the market potential of its activities. Moreover, it is increasing the connectivity of the modernised ECoE with the industry in Cyprus and the EMMENA through the close collaboration with CLK, the project's industrial partner, improving the current TRL level of the ECoE in specific topics of Disaster Risk Reduction, with the main interest on environmental hazards, through the research exploratory project, leading to the first AI-EO products of the ECoE, facilitating the exploitation of the project's results beyond its end.

The ILO held several meetings between CYRIC, E.U.C. Research Centre Ltd, I.A.CO Environmental and Water Consultants Ltd and FREDERIK Research Center to explore new ways of partnership in the field of R&D in the engineering sciences with application to a significant environmental challenge; forest management and monitoring. ILO strengthened this initiative further by identifying potential partnerships from Cyprus. Hence, a consortium was created to submit a proposal (**Green-HIT**) that received outstanding scores and was deemed eligible for funding to develop a holistic IoT platform for forest management and monitoring using cutting-edge Information and Communication Technologies to promote digital and green technology. The platform will support (a) prevention, detection, and reaction to forest fires, (b) afforestation and/or reforestation recommendations, (c) protecting forests from illegal logging and hunting, (d) monitoring forests and forest areas, and (e) forest mapping and inventory by collecting, combining and analysing field data and remote sensed data.

Furthermore, the liaison officer held meetings with Aristotelio Panepistimio Thessalonikis, Geospatial Information Technologies P.C., Cellock Ltd, University Of Turku, Koninklijke Musea Voor Kunst En Geschiedenis, Kentro Meleton Asfaleias, Hellenic Police, Heritage Malta, Noesis Technologies, Miralab Sarl, Anysolution S.L. to find common ground for collaboration in ECoE's pillar resilient society, where the tracking of the looting of Cultural Heritage artefacts plays a significant role in the cultural identity of the EMMENA region. Towards this end, an outcome of such networking was the submission to a HORIZON-CL2-HERITAGE call of the proposal **ENIGMA**. Moreover, another successful submission with the name **TRIQUETRA** was made under the same call, where ECoE's liaison officer brought together a multidisciplinary consortium to develop a toolbox for assessing and mitigating climate change risks and natural hazards that threaten CH. An important role the liaison officer played where after exhausting meetings, the industrial partners such as Engineering Materials for Construction, NanoPhos S.A., and Geosystems Hellas agreed to capitalize upon.

On October 2021, the ILO arranged a series of meetings with CyRIC, the coordinator of the Cyprus Digital Innovation Hub (CyDI – Hub) and the other governmental and industrial stakeholders to identify the needs of the local community to discuss the idea of the DIH. The liaison officer brought a number of companies of the DIH consortium (as indicated below). The writing process began on November 2021, and the proposal was successfully sent on February 2022. CyDI- Hub is a regional



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network hub of research, innovation, business and industry organisations, utilising state-of-the-art infrastructure to bring the fourth digital revolution to Cyprus by offering cutting-edge digital technology innovations and services to the manufacturing industry. Since ERATOSTHENES's structure is a digital innovation hub, ECoE joined forces with governmental and private organisations, SMEs, and industries to enrich, enlarge, expand, and integrate its activities beyond Earth Observation (EO) with other types of businesses, aiming to infiltrate the market through a single CyDI – Hub. ECoE decided to provide the stakeholders in Cyprus with nine Test-before invest (TBI) services; more specifically, remote sensing services focusing on agriculture, smart cities, environment, fires and water leakages. CyDIHub's TBI services make up the most significant part of the service list, including digital innovation services (IoT, AI/ Data Analytics software etc.), concept validation and prototyping, development of intelligent user interfaces, testing and validation services for start-ups and innovative SMEs, pre-commercial production with small scale production of IoT and robotic products, contract research services for novel hardware, IoT etc., knowledge/technology transfer partnerships and commercial exploitation & IP services including patentability analysis.

7.2 Participating organisations in the Digital Innovation Hub

The main aim of the Digital Innovation Hub is to support companies and public organisations to become more competitive concerning their business/production processes, products or services using digital technologies for their digital transformation, bringing the 4th Digital Revolution to Cyprus. Furthermore, another target is the creation of links with other hubs, filling missing competencies and getting support in creating new services and tools. The digital transformation of SMEs, small midcaps and public organisations will be successfully implemented through a plethora of KPIs; more specifically, more than 9.900 business entities will have used the hub's services in the course of 3 years. Table 5 below presents a list of the participating organisations in the Digital Innovation Hub.

Table 5: Participating organisations in the Digital Innovation Hub

No	Participating organisations
1	CYPRUS DIGITAL INNOVATION HUB (CYDIHUB) LTD
2	FREDERICK UNIVERSITY FU
3	RTD TALOS LIMITED
4	GRANTEXPERT CONSULTING LIMITED
5	ARCHI PSIFIAKIS ASFALEIAS
6	ANOIKTO PANEPISTIMIO KYPROY (OPEN UNIVERSITY OF CYPRUS)
7	AKTI KENTRO MELETON KE EREVNAS
8	CYBAN CYPRUS BUSINESS ANGELS NETWORK LTD
9	CY.RI.C CYPRUS RESEARCH AND INNOVATION CENTER LTD
10	EDEX – EDUCATIONAL EXCELLENCE CORPORATION LIMITED
11	C.B.T. CYPRUS BLOCKCHAIN TECHNOLOGIES LTD
12	TECHNOLOGIKO PANEPISTIMIO KYPROY
13	NEAPOLIS UNIVERSITY
14	ERATOSTHENES CENTRE OF EXCELLENCE



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No	Participating organisations
15	EUROPEAN UNIVERSITY CYPRUS
16	EUROPEAN OFFICE OF CYPRUS
17	GRAVITY VENTURES LTD
18	Cyprus Information Technologies Enterprises Association
19	CENTER OF INTERDISCIPLINARY SCIENCE PROMOTION AND INNOVATIVE RESEARCH EXPLORATION (INSPIRE)
20	UNIVERSITY OF CYPRUS
21	CYPRUS COMPUTER SOCIETY



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8. NEXT STEPS

Additional activities of the ILO will be to promote its services through existing networks such as

- 1) Invest Cyprus, the national investment promotion agency dedicated to attracting and facilitating foreign direct investment into the country;
- 2) preparation of promoting material emphasising in services and entrepreneurship mentality of the Centre (such as video and flyers focuses in the infrastructure as well as services & applications in collaboration with WP9) which can be used through governmental channels to promote ECoE's services and products at a national level to attract and expand the Cypriot market in the EMMENA region and Europe and
- 3) participation in international exhibitions and networking with embassies to promote the provision of EO services and opportunities to expand in the EMMENA Region.

The ILO already has planned its steps in searching and expanding the collaborations abroad by strengthening the industrial image of the Centre through international and domestic business networks such as the European Business and Innovation Center and the Cyprus Forum. Capitalizing on these networks, the ILO will attract companies to invest in ECoE's satellite and geospatial products. At the same time, with the aid of Cyprus Invest, the ILO will outreach to companies that operate in the broader region of the EMMENA, and in particular from nearby coastal countries. An important task which the ILO is equipped with constitutes the organization of informative seminars with key stakeholders of the region, as well as with foreign embassies, where through the ambassadors, where the ILO will initialize contacts with their countries' industrial sector, local authorities, or non-governmental organizations.



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9. CONCLUSIONS

In this report, a detailed description of the liaison office's function, activities and future plans has been made. The Liaison Office is a bridge linking the ERATOSTHENES Centre of Excellence with industrial actors in Cyprus, EMMENA and Europe. Through its various activities, such as online meetings with industrial partners for possible collaborations, MOU's and workshops, the office contributed to the success by linking the ECoE staff with partners, as shown by the 14 project proposals, which received funding and secured 2.6 million euros for ECoE. The liaison office's task is to make the necessary actions to promote ECoE's services in the EMMENA region and Europe and prepare the ground for cooperation toward ECoE income diversification and sustainability through different networks.

This deliverable reported the activities up to M36, where the ECoE liaison officer will build and expand upon for future co-design / co-develop of the Centre's services (at their initial stages) and will capitalize all the existing activities and measures of the liaison office for advancing target activities, thus laying the ground for prominent commercializing future.