DESTINI

SMART DATA PROCESSING AND SYSTEMS OF DEEP INSIGHT

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Deliverable D4.2

Minutes of the Industrial and Market Strategic Advisory Board (volume 1)

Document details:

Editor:	CUT
Contributors:	CUT
Date:	30/12/2020
Version:	V5.0

Document history:

Version	Date	Contributor	Comments
V1.0	05/01/2021	CUT	Initial document structure
V2.0	18/01/2021	CUT	First internal draft
V3.0	11/02/2021	Partners	Review, comments for corrections
V4.0	22/02/2021	CUT	Changes, adjustments
V5.0	26/02/2021	Partners	Final review and approval

Contents

1. Introduction

This deliverable provides information about the establishment of the Advisory Board that consists of seven (7) major players in the regional/national economy, including representatives from the government, industry and businesses that align with the Smart Specialisation Strategy of Cyprus (S^3Cy).

The aim of the Advisory Board is to meet every six (6) months to provide advice and support for applied technological research related to the area of smart data processing and systems of deep insight and their application to real-world problems.

This deliverable outlines the main outcomes of the communication with the Advisory Board, the opportunities for collaboration and their suggestions thus far that mostly guided the development of the upcoming case-studies and the preparation of proposals for attracting new funding. The members of the Advisory Board were informed separately about the scientific areas of focus and were invited to join the virtual training sessions performed.

The rest of the document is structured as follows: Section 2 describes briefly how the Advisory Board was formed, while section 3 presents the outcomes of the initial discussions between the consortium and the members of the Advisory Board. Section 4 presents the problems encountered as a result of the covid-19 virus outbreak and affected the smooth communication and collaboration between the consortium and the Advisory Board during the first periodic report. It also describes an opportunity pursued for attracting new funding. Finally, section 5 concludes the deliverable and an Appendix closes the document with the invitation that was sent to members of the Advisory Board for their participation.

2. Establishment of Advisory Board

The covid-19 virus outbreak and the corresponding restrictive measures, including the lockdowns in each of the participating countries but especially in Cyprus, did not permit the full rolling of the relevant activities for engaging the stakeholders and the project's Advisory Board as much as desired and planned. As a result, the present deliverable is compromised, with its content including only basic information about the Advisory Board and the initial findings of its collaboration with the consortium of DESTINI as a result of discussions held on a one-on-one basis with each individual member over teleconferencing.

Despite the difficulties faced due to covid-19, the consortium managed from the beginning to identify the target-stakeholders for the Advisory Board and define an initial list of companies, organizations, public and governmental bodies that were considered useful to include. These stakeholders were contacted individually through telephone and electronic means (e.g., email, skype, ZOOM etc.). This first communication targeted mostly at describing the targets of the project and explaining the vision of the consortium towards applied research, as well as the importance of having real-world cases and problems as our case-studies through their engagement. Their response was very positive and the consortium was very happy to welcome major players in the local market and industry of Cyprus that will definitely assist the DESTINI to focus on significant challenges and problems in various application domains. The next step was a follow up virtual meeting and discussion, during which some first directions of applied research were identified. These directions are briefly described in the next section.

The members of the Advisory Board are:

- The Cypriot Ministry of Industry, Commerce, Energy and Tourism;
- Hellenic Bank Ltd.;
- The Water Board of Lemesos;
- Paradisiotis Group;
- Limassol Municipality;
- Uniteam Marine Ltd.;
- The Cyprus Institute of Neurology and Genetics.

Each of the above organizations will play a different role and will offer its expertise in a target-area or market segment which is considered important for the economy of Cyprus, the Mediterranean region and the European Union.

3. Minutes of Preliminary Discussions with Advisory Board

The relevant discussions so far suggest that the members of the Advisory Board are expected to assist the consortium to perform applied research and identify problems and challenges in specific areas as follows:

I. Cypriot Ministry of Industry, Commerce, Energy and Tourism

This is the governmental body to plan and exercise policies in the sectors it covers, namely Industry, Commerce, Energy and Tourism. All these sectors, but especially the last one, are considered as the strongest pillars of the Cypriot economy. Discussions between the partners and representatives of the ministry revealed synergies in the area of smart manufacturing (or Industry 4.0), on which the ministry places great emphasis and would like to boost in the upcoming years. DESTINI may become a test-bed for applying proof-of-concept models, tools or techniques based on smart data processing, offering solutions for optimizing production, facilitating automated and predictive maintenance, and offering models, such as smart digital twins, for production monitoring and control. In addition, the Tourism sector exhibits rich volumes of data recorded by the Statistical Services of Cyprus, and preliminary suggestions indicated the need to approach trends of tourist reservations and income, taking into account both seasonality and unexpected threads, such as the covid-19 virus outbreak, with smart processing and systems that will process these data and provide predictions or estimations of the relevant indices.

II. Hellenic Bank Ltd.

This is one of the largest banks on the island of Cyprus both in terms of branches and of customers. Discussions with senior members of the bank (e.g. the General Manager of Corporate Development & Products and the General Manager of Human Resources) indicated that there is fertile ground for collaborating on a number of challenges the bank faces, ranging from smart models and algorithms for fraud detection and credit scoring to visualization & analytics of business data and recruitment support tools. It is anticipated that Hellenic Bank will direct DESTINI's effort for applied research in the banking and financial sector.

III. The Water Board of Lemesos

The WBL is one of CUT's strategic partners with a long history of collaboration in various projects. This semi-governmental organization has many different applications that could

be developed and quite a few problems that may be investigated and tackled through DESTINI. Recent discussions with the Director of WBL and the Head of Technical Services led to the conclusion that leakage detection, water supply management, processing of huge volumes of data from dispersed sources and different types of sensors across the water network are of paramount importance to them. This led to preparing a new proposal called EPIRROI-2 that has been submitted under the call Interreg VA, Greece – Cyprus Program "2014-2020" with the target being to detect water leakages in the network as early and accurately as possible using noise sensors (see next paragraph). Apart from this proposal, the WBL will assist the consortium to investigate applied smart processing techniques for critical public infrastructure such as water networks.

IV. Paradisiotis Group

This is one of the leading industries in Cyprus and its activities for poultry meat production include chicken breeding, slaughtering, mixing and packaging. They have already high-tech equipment, such as the system that automatically monitors living conditions in the chicken farm and controls temperature, humidity and ventilation. Discussions with the owner and director of the group, as well as technicians at various levels, led to the preliminary identification of areas of collaboration that will help DESTINI direct its research and scientific efforts towards real-world industrial problems.

V. Limassol Municipality

Limassol Municipality is one of the most active municipalities in Cyprus in the area of smart cities. It has participated in numerous related projects, both national and EU-funded, some of which in collaboration with CUT. The municipality has an extensive experience in this area and it is the main body of policy making for the city of Limassol as regards new approaches that will help make the city smarter. Therefore, it is considered a key member of the Advisory Board that will help the consortium exploit the benefits of smart data processing and systems of deep insight for supporting smart cities. Discussions between members of the municipality board that are responsible for the issues revolving around smart cities concluded that various topics can be addressed in close collaboration, such as optimization of routes for garbage collection, smart traffic management, pollution detection, crowd assembling avoidance in cases such as major events (e.g. carnival) or health situations (e.g. restrictions due to the covid-19 virus), etc.

VI. Uniteam Marine Ltd.

Uniteam Marine is an international ship management organisation headquartered in Cyprus that provides industry-leading services to ship owners and ship managers across

a wide range of countries and jurisdictions. It is expected that it will provide its expertise on shipping and transportation to DESTINI and will be able to consult its where to focus its applied research efforts in the broader sector of Transportation. Initial discussions revolved around technical management and crew management with smart data processing techniques and models. It appears that there is ample room for collaboration and a rich number of challenges in this area, such as ship predictive maintenance, emissions monitoring and control (such as sulphur), visualization and analytics, etc.

VII. The Cyprus Institute of Neurology and Genetics

CING was established in 1990 as a bi-communal (Greek- and Turkish-Cypriot), non-profit, private, academic, medical center. The vision of CING is to function as an International Centre of Excellence and a Regional Referral Centre in the areas of Neurology, Genetics, Biomedical, Medical and other similar and related Sciences. The mission of CING is to develop and provide high level medical and clinical laboratory services, develop and pursue advanced research and provide education in the areas of Neurology, Genetics, Biomedical, Medical and other similar and related sciences. Its ultimate scopes are to improve and upgrade the quality of life of all Cypriot citizens, irrespective of religion or national origin, and strengthen its international role in the areas of its specialty. Bioinformatics ERA Chair has recently been established at CING, with major focus on Computational Diagnostics and Therapeutics inside the fields of Systems Bioinformatics and Medical Informatics. CING's Bioinformatics ERA will be a valuable member of the project's Advisory Board introducing DESTINI to problems in the health area. Preliminary discussions with the ERA chair holder of CING were performed during which it was agreed that there will be strong collaboration between DESTINI and CING's Bioinformatics ERA Chair based on a high level of synergy and complementarity of the skills and competencies between the two teams, such as data analysis, modelling, estimation, prediction and decision support.

4. Challenges and Opportunities

The covid-19 virus outbreak and the corresponding restrictive measures, including the lockdowns in each of the participating countries but especially in Cyprus, did not permit the full rolling of the relevant activities engaging more the members of the Advisory Board and exploiting their

expertise better. The consortium first managed to identify the target-stakeholders and define an initial list of companies, organizations, public and governmental bodies. These stakeholders were contacted through telephone and electronic means (e.g., email, skype, ZOOM etc.). This first communication targeted mostly at describing the targets of the project and explaining the vision of the consortium towards applied research, as well as the importance of having real-world cases and problems as our case-studies through their engagement. The response was very positive and we were very happy to welcome major players in the local market and industry of Cyprus, as well as governmental bodies.

Despite the covid-19 virus continuing restrictions, the consortium managed to initiate communication with a sufficient body of stakeholders in Cyprus, from which a selected group plays the role of consultant for real-world experimentation participating in DESTINI's Advisory Board. The task of establishing the Advisory Board was moved six (6) months later compared to the plan, so as to be able to reach members from all sectors initially identified but were not easy to reach due to the covid-19 implications to the working activities of these members.

The virtual meetings between the partners and members of the Advisory Board facilitated the exchange of ideas and brainstorming, resulting in the directions described above in the previous section. In addition, as previously mentioned, the consortium worked closely with the Advisory Board for the preparation of proposals to attract additional EU and national funding. Since the covid-19 restrictions hindered the execution of some activities, the consortium decided to launch tasks which should normally be started later, to compensate for the missing time and be able to remain active and constructive. In this context, one new proposal was prepared and submitted by CUT for attracting EU-funding, and the collaboration with major projects was initiated.

The new proposal was called EPIRROI-2 (Influence in Greek) and was submitted under the pillar Interreg VA, Greece – Cyprus Program "2014-2020" (currently under review) in close collaboration with one of the members of the Advisory Board, namely the Water Board of Lemesos. The project is based on another project which was successfully completed under the same pillar approximately one year ago (EPIRROI-1) and extends and enhances its basic functionality and scope. The aim of this proposal is closely related to the DESTINI project as it utilizes models and techniques for smart data processing. The aim of EPIRROI-2 is to detect early and accurately water leakages in water supply networks using noise sensors that will be installed on pipes in selected positions across the network, and GIS technology. The information from the sensors will be received in real-time and the system will detect a leakage through proper mathematical equations and will accurately display its location and magnitude. The system will also analyze historical leakage data and correlate it with network information (e.g., type, age, diameter of pipes) through Fuzzy Cognitive Maps to predict future maintenance needs and

proactively perform the relative repairs or substitutions of parts (preventive maintenance). The project will also enhance an existing mobile application which provides augmented reality capabilities by depicting the underground networks of other services (e.g., telecommunications or electricity) that are present around the detected leakage spot so as to direct maintenance works properly and avoid causing damages to other networks, thus reducing the cost and time of repairs.

5. Conclusions

This deliverable is actually a shortened version of what was intended to include. It contains only the preparatory activities for communicating with selected stakeholders and establishing the Advisory Board, the work of which was greatly affected by the covid-19 virus outbreak as previously explained. It also describes how preliminary discussions with members of the Advisory Board separately (i.e., one-on-one) gave birth to some scientific directions for DESTINI to focus on for performing applied research in the future. In addition, this deliverable provides information about a new proposal that has been prepared and submitted to attract new funding.

It is anticipated that the rest of the content described in the DoA, as well as the minutes of the meetings/discussions of DESTINI's consortium with the Advisory Board that normally will follow and be intensified in the upcoming months, will be included in the second volume which will be made available through deliverable D4.8 towards the end of the project.

Appendix: Invitation Letter

Dear <*name, company data*>,

With this letter the consortium of the DESTINI EU-funded project cordially invites you to become a member of its Advisory Board. The Advisory Board has been formed to cover major application domains that are of interest to the project and the people that will participate have been carefully selected so as to bring value and knowledge for a particular domain. The target of the Advisory Board is to make suggestions and offer general guidance about potential areas of applied research that may be benefitted by the work performed in the project. DESTINI's activities revolve around exchanging scientific knowledge and transferring best research practices amongst its partners in the area of Smart Data. More specifically, two internationally recognized scientific institutions, namely Tilburg University and Jheronymous Academy of Data Science from the Netherlands and Sapienza Universita di Roma from Italy, will collaborate with the Cyprus University of Technology and share their knowledge and expertise in the area of data collection, organization, processing and transformation into useful insights that will offer solutions to, or tackle complicated problems in a wide variety of application domains, such as health, tourism, shipping and industry. The identification of specific problems that will be addressed in this context is of vital importance. This is the first of two aspects the Advisory Board will offer its expertise to the members of DESTINI's consortium and help defining challenging areas of applying the project's research results. The second, once the challenging areas have been identified, is to provide feedback and support for discussing with relevant stakeholders in each area and guidance for collecting the necessary data for future experimentation. It is anticipated that the Advisory Board will meet 2-3 times each year for the next 2 years, either with physical or virtual presence, at dates that will be agreed between its members in advance.

We would be very glad and honoured if you accepted this invitation.

We remain at your disposal for any further information.

Sincerely,

Professor Andreas S. Andreou

Cyprus University of Technology

Project Coordinator