Personalised Health Monitoring and Decision Support Based on Artificial Intelligence and Holistic Health Records

D8.5 - Exploitation plan I

WP8 Communication and Exploitation

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Executive summary

Deliverable D8.5 is the first iteration of the exploration plans of the iHelp project and includes the strategy, the joint exploitation approach, as well as the update of the partners' individual plans, describing their intentions for exploitation of iHelp outcomes, detail their plans to achieve the targeted exploitation goals and report progress on planned actions. The second and third iterations of the exploitation plans will be made available on M24 and M36 respectively, with the document D8.6 and D8.7.

1 Introduction

The objectives of this deliverable are to lay out the strategy on how exploitation activities are organized in the project and to report on the initial exploitation activities, which cover the starting period of the project (M1-M12).

The document is structured in 5 sections. Further to this introduction, in Section 2 the overall exploitation strategy is defined with a list of key tasks, considerations, IPR handling, as well as the 3 exploitation phases. In Section 3, the initial list of exploitable outcomes is presented, as well as the link of exploitation task (T8.2) with Innovation Management activity (T1.3). In Section 4, the iHelp solution, which will be the main result of the project and the basis for joint exploitation, is presented and discussed. Finally, in Section 5, the document includes the individual exploitation plans of all partners.

2 Exploitation strategy

2.1 Strategy definition

iHelp project has planned to start the exploitation task from the beginning of the project, even if the effort would be limited in the first year, so as to introduce a 3-year strategy that will be the framework of the joint exploitation. For this purpose, exploitation activity prioritizes following tasks:

- Market Analysis to determine the market context for iHelp results and to conduct a detailed market-positioning study;
- Formulation of different initial adoption models' scenarios;
- Innovation Management activity;
- Identification of Business Models.

In the first year, the project has presented the main challenges of joint exploitation and created awareness on the points that the partners must consider to increase the chances of making an ambitious – yet realistic- exploitation plan. These challenges are:

- **Consortium Agreement (CA):** How the CA can be 'interpreted' to the partners that do not necessarily have the appropriate background to determine the main challenges between backgrounds and foregrounds.
- **Definition of the exploitable outcomes:** Which of the project deliverables can be considered as exploitable backgrounds, which can be exploited at partner- and consortium-level.
- **Innovation Management process:** How can Innovation Management contribute to the 'nurturing' of innovation potentials to exploitable outcomes that will be managed by this task and be considered for joint exploitation.
- **Licensing challenges:** How should licenses be managed, both when utilizing 3rd party software artefacts, but also when the project opens the discussion about licensing of its own components (e.g. backwards compatibility).
- **Joint exploitation:** How can joint exploitation be realistic, given the number of partners and the (often) diverse priorities.
- **Technology Readiness Level (TRL)** of outcome(s) at the end of the project: What is a realistic TR for the end of the project and how can this be further developed to a higher level, after the end of the project grant.
- **Market and potential customers:** What is the landscape of the market and who are the potential customers of the project solution?
- **Engagement of partners:** How can partners be engaged into an actual exploitation and how can formal barriers be addressed efficiently?
- **Flexibility for individuals:** How can project researchers be empowered to take leadership into certain exploitation tasks, in a way to strengthen the actual exploitation and to be in line with their organization policies.

Following the discussions of the above topics, the project has created a use-case driven exploitation strategy that can be implemented in phases and will aim to bring together partners with active participation of SMEs and individuals. In the next section, the phases are presented, as well as the link with IPR and Innovation Management.

2.2 Exploitation Phases

The 3 phases of the exploitation activity are defined as follows:

- **Phase I (M1-M12):**
  - Strategy definition
  - Introduction to joint exploitation path
  - Sustainability plan
  - Initial exploitation plans by each partner

- **Phase II (M13-M24):**
  - Market analysis
  - Exploitable outcomes
  - Target customers
  - Business Models

- **Phase III (M25-M36):**
  - Business plan for joint exploitation plan
  - Elaboration on the individual exploitation plans

2.3 IPR handling

Intellectual Property Rights management has become increasingly important in European Projects. IPR is an integral part of the project and enables partners to:

- Disclose knowledge and ideas safely;
- Prove ownership;
- Profit from commercial exploitation;
- Prevent or discourage its unauthorized use by others (The European IPR Helpdesk, 2017), (The European IPR helpdesk, 2015).

The IPR issues are managed in task T8.3 (Standardisation, IPR and Ethics Management) and there is a strong link between these tasks, given that clear IPR guidelines are necessary to facilitate a successful exploitation of projects' outcomes.

2.3.1 IP Scan Service by the EC

In order to assist the project in coming up with a well planned Intellectual Property (IP) strategy, but also to support the joint exploitation activity, Innovation Sprint has signed up on behalf of the iHelp project, for the IP Scan Service that is provided by the European Commission to participants in Horizon 2020 projects. Innovation Sprint is a major partner of the project and iHelp overall architecture utilizes to a good extend Healthentia, a certified eClinical and MedTech solution of Innovation Sprint. The choice of Healthentia supports the quick uptake of the results and the joint exploitation, while at the same time creates the need to have a clear IPR strategy to avoid any future challenges.

It is usual that SMEs, who by default struggle when it comes to assessing and protecting their IPs, to make use of the IP Scan Service. For this reason, Innovation Sprint has participated to this service, so as to bring back to the consortium important information on how to manage IPs more efficiently in the project.

The main topics of discussion with the IP Scan Services were:

1) How can partners 'secure' their background IP, given that usually there is only a short table in the Consortium Agreement that lists background assets of project beneficiaries?
2) How can the consortium record the actual partners' contribution to a foreground IP generated under the scope of the project, given that tasks are related with each other and practically any partner can potentially claim direct or indirect involvement into an asset?
3) How can a partner release a variation (or derivative) of a background IP, as a foreground IP for joint exploitation that includes the project's customization (foreground) and the existing asset (background)?

The IP Scan Service will provide in the coming weeks the outcome of the scan and will make suggestions that the consortium may use to facilitate the joint exploitation.

3 Exploitable outcomes

3.1 Definitions

Alongside the main exploitable outcome of the iHelp project: the iHelp platform itself, the project has the opportunity to generate various other exploitable outcomes. In Table 1 below, an overview is given of those project results that could potentially evolve into exploitation outcomes:

Table 1: Initial list of exploitable outcomes.

iHelp Result	Target Market	Foreseen Exploitation Value
iHelp Knowledge Base of early risk predictions, interventions and preventive measures	Healthcare Solution Providers for high-risk individuals, Cancer Patients; Policy Makers; Researchers	Integration of the knowledge base as a key enabler of knowledge intensive approaches to cancer treatment and/or prevention, but also to the design of related evidence-based policies
iHelp Data Management Framework	Healthcare Solution Providers; Healthcare platform providers, Databanks, Researchers, System/Solution Integrators	The framework for the integration of heterogeneous datasets and management of big health data in a standardised format will be a cornerstone of any technical effort aiming at personalized healthcare solutions
iHelp Data Analytics & AI Algorithms	Healthcare Service/Solution Providers; Data Scientists, Researchers, Pharma companies	Advance AI techniques are the foundation for developing and validating data driven approaches to Cancer (and other health-related) pathways. Their reusability and exploitation potential are very high in the modern healthcare domain
iHelp User Centric (Mobile, IoT & Wearable) Applications	Healthcare Service/Solution Providers, social platforms, Digital trial providers	User centric applications for delivering personalised recommendations/decision-support and gathering vital health related data is the key to any personalised healthcare solution. Their utilisation and business prospects are wide ranging based on new business models that harness the potential of mobile, wearable and social platforms
Visualization Solutions	Healthcare Solution Providers & system Integrators, Policy makers (Medical Experts, Carers)	User-friendly data analytic dashboards that provide data driven insights and evaluation means through visualisations are vital to support policy making, where integrated views are required to assess multiple dimensions of available (integrated and interoperable) data

3.2 Link with Innovation Management

The goal of the Innovation Manager is to support the project in the identification of potential innovations. To achieve his goal, the Innovation Manager must contrast the technological and methodological developments carried on by the project with the current and emerging market trends. The Innovation Manager collects information about the project's technological and methodological developments from the Project Management Board, the WP leaders and the Technical Coordinator. The Innovation Manager collects information on the current and emerging market trends from the project's Exploitation Coordinator. Figure **1** presents the interactions between the Innovation Manager and the project's actors.

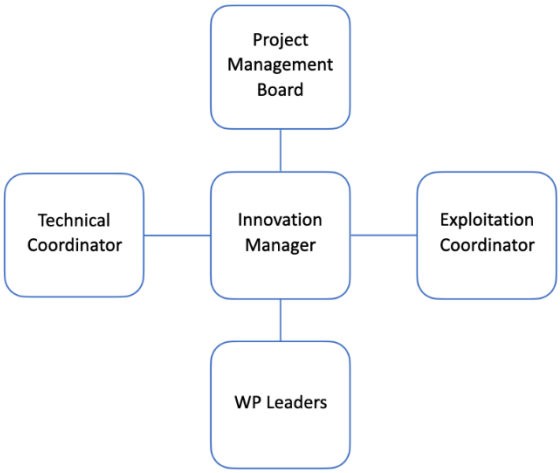

Figure 1: Interactions of the Innovation Manager role.

The current list of innovative technological choices that are identified by the Innovation Management activity and can lead into additional exploitable outcomes are:

- Personalized Health Modelling and Predictions/ Artificial Intelligence (AI) - T4.1 "Personalized Health Modelling and Predictions"
- DRyICE technology developed by partner ICE, used to realize the Model Library component in the iHelp platform - T4.2 "Model Library: Implementation and Recalibration of Adaptive Models"
- BigData Platform based on LeanXcale datastore with its ultra-scalable database that supports mixed OLAP+OLTP workloads - T4.4 "Big Data Platform and Knowledge Management System"
- Social Analyser - Real Time Monitoring and Analysis of Social Media Information - T5.4 "Social Analytics for the Study of Societal Factors and Policy Making"
- Real Time Monitoring of Personalised targets, Configurable Alerting and Feedback Mechanism - T5.5 "Monitoring, Alerting, Feedback and Evaluation Mechanisms"

4 Joint exploitation plans

4.1 iHelp solution

iHelp aims to early detect and mitigate the risks associated with Pancreatic Cancer applying advanced Artificial Intelligence (AI)-based techniques to support the actors of the system. Those techniques are performed on historic data of cancer patients gathered from existing cohorts and biobanks. The models developed, through the AI-based learning techniques will be useful to identify the risk earlier, and to elaborate a mitigation plan. As described in D2.1 and D2.4, a software platform will be developed in the iHelp project that will provide several features, interacting with different actors. Figure **2** places the actors in the context of the iHelp platform.

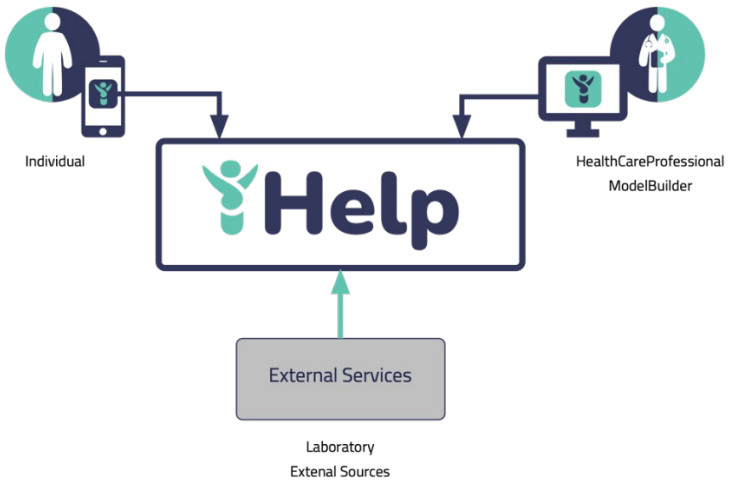

Figure 2: iHelp Context diagram.

The iHelp box, in the middle of the Figure **2**, abstracts all the complexity of the platform, that will include: the ability of the system to accept and transform data from external sources to the common data model; the components that implement the AI of the system; the services that provide the presentation layer for rendering the final user applications, the components that will manage the authentication, infrastructure components, and so on.

The above-described platform will be the iHelp solution, which will be the main project outcome for joint exploitation.

4.2 Sustainability

The project has initiated from the first phase of the exploitation strategy the discussion about how iHelp can become a self-sustained solution. More specifically, following questions have already been raised and addressed:

a) How to make sure that background solutions used in the project will not be blocking any future exploitation?
b) How can outcomes based on background IPs be jointly exploited by the iHelp partners?
c) How can project outcomes be exploited by partners who bring background IPs individually?

With regards to point (a), the project has agreed to the following measures, to avoid any issues, such as “vendor lockup”:

- The partner who provides background IP in the project will elaborate on what is included under the background.
- Partners providing background IP will provide a framework for privileged perpetual license to the iHelp partners.
- Assure an iHelp open solution (e.g., open API), able to integrate components from other vendors in the future and be independent of background technologies.

As far as point (b) is concerned:

- Partners can use the foreground of iHelp to enhance their offering, having prior to that engaged in providing privileged licenses for their background IPs.
- The iHelp partner can exploit the overall platform jointly, in which there will be several roles for the consortium, such as: service provider(s), vendors, system integrators, and so on.

Finally, related to point (c):

- Partners who are providing background IPs in the project and build foreground IPs on top, can still exploit the developments that are created by them solely, in their more general and non-project specific way.

5 Individual exploitation plans

This section presents the individual exploitation plans of the iHelp partners.

5.1 University of Piraeus Research Centre (UPRC)

As a non-profit academic institution, UPRC intends to be involved in challenging, real-life problems that extend its research interests to new areas and thus advance and proliferate scientific knowledge. Nonetheless, UPRC members aim at exploiting the outcomes of research projects, by developing and releasing “products” that meet a set of quality requirements such as software tested, accompanied documentation, installation guidelines and best practices. Regarding target groups, UPRC (as a university) addresses researcher in the domain of software engineering and distributed computing. Based on the above, UPRC exploitation will be in the context of UPRC's strategic plans in the areas of: (i) Education: iHelp results will be proliferated among the attendants of the University activities, mainly among postgraduate and continuing education programs, (ii) Technology transfer to the Greek IT industry and public bodies through joint projects, and (iii) Technology promotion in the Greek policy makers as part of an effort to increase the iHelp awareness and the adoption of prevention and intervention models based on the lessons learned in the project. Moreover, the exploitation path for the Standardisation and Quality Assurance mechanism that will be implemented under the scopes of T3.4 can be fulfilled and characterized as successful in case that this mechanism can integrate and be used also in other platforms, projects, and products. Workshops, seminars, and tutorials will follow and complete its overall reusability and utilization. Moreover, its overall functionality can be proven based on its generalization and functionality in different domains. To this end, the overall impact of this mechanism, will be calculated based on the number of research citations, the total number of the different projects and researches that it will be implemented, as well as its functionality in multiple domains and research topics.

5.2 Athens Technology Centre (ATC)

ATC is strongly involved in two main groups of activities in iHelp. Via the first group of activities ATC and the related partners aim to model the primary and secondary data, provided by the pilots, following the Fast Healthcare Interoperability Resources (HL7 FHIR) structure and organised in the new HHR structure before it is stored in the big data platform. New structures will be made available, containing information towards personalisation parameters and health associated properties such as lifestyle, fitness, wellbeing, social-related parameters such as behaviours, relationships, interactions, events, trends, experiences etc. The description and expansion of the HHR model will be based on an ontological level in order to accomplish a high degree of semantic interoperability. The iHelp semantic representation could be exploited in the future, as a basis for mapping the health-related data from hospitals, according to the proposed schemas, fields and relationships. Moreover, new standards dedicated to cancer related datasets (such as m-code) could be expanded, reformed, updated or could be designed from scratch. By this way, ATC could propose contributions for the expansion of the FHIR standard.

The second group of activities is being developed under WP4 and WP5 and it is related to the delivery of mechanisms to extract knowledge from the HHR, using AI algorithms. The ultimate goal is to detect risks based on the analysis of historic,real time, primary and secondary data for patients. In particular, algorithms will be developed to analyse streaming data related to health i.e., lifestyle and social interactions and to evaluate the impact of symptoms, decisions, and environment dependent on lifestyle choices and mobility

modes. These analytic techniques and AI algorithms give the potential to perform healthcare tasks such as disease diagnosing faster and more accurate than humans. The creation of such leading-edge technological AI 'health related' algorithms is highly associated with several technological areas. ATC can exploit these algorithms for the creation of Clinical Decision Support Systems (CDSS) in diseases related with cancer and in implementation of big data & AI platforms and digital trials or IoT platforms.

5.3 LeanXcale (LXS)

LXS is a Spanish IT company, developing an ultra-scalable transactional database that is full-SQL with Analytical capabilities (HTAP database), having polyglot capabilities in order to combine datasets coming from different and heterogeneous data sources. The target exploitation goal of the company is to commercialize the customization of its database technology for the market and the project will enable to perform the large-scale piloting necessary to mature the technology and be able to go to market. Moreover, the goal also relates to providing the framework for the integration of heterogeneous datasets and management of big health data in a standardised format that will be a cornerstone of any technical effort aiming at personalized healthcare solutions.

LXS exploitation strategy for iHelp involves aligning the project's outcomes to the company's commercial strategy for the LeanXscale database. In this direction, LXS will explore the possibility of entering more aggressively the BigData for healthcare market, through targeted promotion of the LXS database to this segment. At the same time, LXS will take advantage of the project's results towards enhancing the product with functionalities that are not extensively developed up to date (e.g., management of imaging data at scale).

The business model will be a product that can be deployed on premise and a cloud service. The company is expected to duplicate its size from 15 people to 30 people. We envision, as possible, filling a patent application to protect the results of the project.

5.4 KODAR Systems (KOD)

KODAR and its associated third parties DS4 and Strypes are focused on R&D activities and possess vast experience in the fields in machine learning, AI driven diagnostics, anomaly detection and proactive symptom monitoring for failure prevention and mitigation in mission critical systems.

The data processing and analytical architecture in the project is targeting the healthcare domain but it's foundation make them applicable in much broader scope of applications, so we plan to develop and improve our current portfolio of AI and data-analytics solutions and services, and extend their potential. KOD aims to commercialize iHelp specific DSS, Big data processing and monitoring architecture as well as their associated data storage and processing sub-architectures in a number of appropriate markets under research at present.

5.5 Innovation Sprint (iSPRINT)

Innovation Sprint business strategy is built around its Healthentia cloud-based platform, which iHelp is using to offer in-home personalized healthcare services including coaching. iSprint individual exploitation plans for iHelp include the improvement of Healthentia with virtual coaching and diagnosis services for the specific pathology, including the iHelp's personalised healthcare awareness and monitoring model. Based on the outcomes of the project, iSPRINT will possibly initiate a clinical study to record clinical evidence

about the improvement of health-related endpoints and include pancreatic cancer as an indication for the upgraded Class IIa certification of Healthentia Medical Device.

5.6 Engineering Ingegneria Informatica SpA (ENG)

With approximately 12,000 professionals in more than 40 locations (in Italy, Belgium, Germany, Norway, Serbia, Spain, Switzerland, Sweden, Argentina, Brazil, Mexico and the USA), the Engineering Group designs, develops, and manages innovative solutions for the areas of business where digitalisation generates major change, such as Digital Finance, Smart Government & E-Health, Augmented City, Digital Industry, Smart Energy & Utilities, Digital Media & Communication.

The Healthcare Division of ENG is the first technological, consulting and management firm in Italy in healthcare market, on all government levels - national, regional and corporate: present in 70% of Italian healthcare institutions with 3 dedicated R&D labs. It aims at redesigning healthcare by digitising processes and leveraging innovative technologies, to improve patient care, quality of work of medical operators and the overall sustainability of healthcare systems. Its complete, integrated and customizable offer includes a portfolio of IT services based on international guidelines (outsourcing and insourcing, applications, system & facility management, Security, Training), a wide variety of products to cover every customer need and Knowage, an open-source analytics and business intelligence suite allowing to combine traditional data and big data sources into valuable and meaningful information.

The main advantages derived from ENG participation in iHelp are:

- Know-how on challenges related to policy management in healthcare based on big data technologies;
- Solutions for the integration of holistic health data enriching the main health record attributes, with behavioural, lifestyle, nutrition, genomics and social properties;
- Possibility to enhance our products with new functionalities;
- Possibility to become more innovative toward our customers with edge solutions not yet fully adopted by most of the other competitors;
- Establish potential business contacts to jointly exploit the results in EU countries not yet covered

The main expected asset of ENG is the extension of the Holistics Health Records (HHRs), that in iHelp will incorporate metadata structures capturing behavioural, lifestyle, nutrition, genomics and social properties.

The ENG exploitation strategy is mainly founded on:

- The innovation of our business offer by using the expertise generated in the project
- Integration of the extended HHR model in our existing solutions

5.7 Siemens (SIE)

Siemens will align and integrate project generated assets in own Machine Intelligence programs. Taking into account the fact that the project develops specific data and ML based models on pancreatic cancer data, considering a generic analytics architecture, it will allow the extraction of pipelines and Python notebooks to be used for a larger number of cases, both for healthcare data but also for other types of diagnostic systems.

Pancreatic cancer methods and data analysis findings will be promoted towards Siemens Healthineers in order to be analysed in the broad landscape of cancer specific software stack that includes AI for early detection of patients assessment.

As previously stated, there is a good potential of reusability for data science results at large, for many cases where operational data is analysed together with systems infrastructure collected data.

5.8 Information Catalyst for Enterprise (ICE)

ICE is an SME focused on developing IT solutions in the broad areas of Services, Data and Software. ICE's target domain is oriented towards the business, systems, and service integrations and in this domain, ICE offers a number of solutions to optimise business operations and enable agile collaborations. In addition, ICE has vast experience in coordinating and managing large scale software development and integration projects in commercial and research environments. Within the iHelp project, ICE is responsible for the overall technical management of the project. Moreover, ICE is actively participating in technical tasks, with significant effort allocated in T4.1 (Personalised Health Modelling and Predictions), T4.3 (DSS Suite), T4.2 (Model Library) and T5.4 (Social Analytics). Based on the potential to develop market relevant innovations in these tasks, ICE will exploit the innovations through its ongoing research to commercialisation activities that leverage closes industrial contacts in business and technology networks.

In terms of exploitation plans, ICE is interested in the exploitation of innovations developed in the following areas:

Data Analytics (T4.1 "Personalized Health Modelling and Predictions")

The Data analytics solutions developed in T4.1 of the iHelp project enable users (such as healthcare professional and medical experts) to manage and extract value from health-related data by executing analytical algorithms and models. Such algorithms and models will enable iHelp pilot partners to correlate and analyse data from a large population from different perspectives e.g., diseases, groups, symptoms, lifestyles, genetic factors, locations etc.

Companies across the healthcare sector can use these innovative solutions to detect anomalies in health profiles, not only enabling them to do better monitoring of personalised healthcare conditions but also make predictions about key health conditions. The algorithms and models developed in this task can also be used as building blocks of a wider decision support solution, such of those that is being developed in the T4.3 of the iHelp project.

ICE plans to release the analytic algorithms and models, developed in T4.1 of the iHelp project, as open-source resource for further use and development in the e-health domain. The developed solutions will be hosted on an open-source registry (e.g. SourceForge), together with technical documentation, from where they can be openly access and used by anyone.

The developed analytic models will also be incorporated in the ICE Data Analytic solution, which is a suite of data analytic solutions developed in-house to address the complex industrial problems being faced in various domains, such as eHealth, digital manufacturing etc.

Model Library (T4.2 "Model Library: Implementation and Recalibration of Adaptive Models")

The AI models developed in the T4.1 task, will require computing resources, hosting and continuous management to make sure they deliver their value in an expected manner to manage the continuous execution and maintenance of the analytic models, and for that a Model Library is being developed in task T4.2 of the iHelp project. The Model Library will provide the necessary computing infrastructure that is capable of supporting the data ingestion, processing and scaling needs of multiple analytic models.

The implementation of the Model Library in T4.2 is based on the DryICE technology from ICE, which in turn is being developed upon a combination of several open-source components.

The developed Model Library solution will be released as an open-source resource to promote its use and uptake across multiple platforms. ICE will maintain the DryICE technology at its own end and further investigate its commercialisation potential in the big data and digital platform domain.

Social Media Analyser Tool (T5.4 – "Social Analytics for the Study of Societal Factors and Policy Making")
A Social Media Analyser tool is currently being developed in T5.4 of the iHelp project. This tool will process and extract meaningful data from the social media platforms and enable the policy makers to analyse the trends and patterns of social discussions, assess the effectiveness and impact of health-related policies; or to help define more impactful policies. In this respect, the Social Media Analyser tool can also be used as an effective tool to gauge the lifestyle trends and build on social interactions and societal influences on the individuals and use the analysed datasets to draw conclusions that would help policy makers in making informed decisions.

The implementation of the social media analyser tool is based on the use of Complex Event Processing, Sentiment Network Analysis, and Natural Language Processing techniques. Using multiple open-source technologies such as Apache Kafka, Apache Flink and Grafana, the social media analyser tool provides a dynamic dashboard to visualise the results of the social media analysis.

The Social media Analyser tool will be provided in 2 different licencing models.

- Open Source – The solution developed in the project will be released as open-source resource as part of the integrated iHelp platform offering. ICE will manage and maintain the solution until the lifetime of the project.
- Commercial – A managed solution will be offered under a commercial licence. This managed solution will be maintained by ICE under the specific terms and conditions agreed with the customers

ICE plans to charge €500/year licence fee per seat. This includes necessary configuration and technical support.

Activities to Support Exploitation
The exploitation of the technology solutions will be supported by the following activities:

- Website – Each product will have a dedicated website to improve product visibility and reach among customers
- Webinars – Specific webinars will be conducted to highlight the product benefits among targeted customers
- Exhibitions – ICE has been participating in multiple Industrial exhibitions throughout Europe. The products will be showcased in these events to generate interest

- Social Media Campaigns – Separate social media accounts e.g., Facebook and Twitter will be created to disseminate product related feeds
- Blogs – ICE will create blogs and publish them on journals and other industry specific platforms for maximum visibility

5.9 Universidad Politécnica de Madrid (UPM)

UPM is the largest technical university in Spain with a long tradition in technology transfer to the industry, creation of spin-off companies and participation in research projects.

UPM as an academic partner will exploit the project results by disseminating the results in master lectures to introduce students to data visualization techniques and the low code programming model used by the Decision Support System (DSS). UPM participates in an EIT Health master programme where iHelp results will be presented.

UPM organizes seminars on topics related to health research at least once per year where the results of iHelp will be disseminated. These seminars are attended by clinicians and hospital staff that might be interested in the iHelp results. Until now, there has been a strong collaboration with an oncologist working with lung cancer. The DSS is used in this project in the context of pancreatic cancer but, it is independent of the specific type of cancer and can be used by a wide spectrum of clinicians. UPM has previously transferred several research results to the industry and will look for opportunities for transferring the iHelp results (mainly the DSS) to interested parties. The DSS will be open source with an Apache license.

5.10 University of Manchester (UNIMAN)

The University of Manchester, as an academic partner, has not prepared widescale exploitation plans until the results of the review process of the pilot study are finished and the effectiveness has been proven. In general, the exploitation plan for the University of Manchester focuses on the dissemination of scientific outcomes instead of more commercial pathways.

5.11 Agostino Gemelli University Policlinic (FPG)

FPG will leverage iHelp's framework to develop personalised healthcare based on real world data in prediction and mitigation of toxicities in pancreatic cancer patients. Behavioural and clinical data integration will help to tailor treatment to each individual patient in order to improve it and to reduce side effects. The iHelp application will allow a better patient follow-up and personalized management of pancreatic cancer patient treated with radiotherapy.

Moreover, the iHelp project will give important insights about the impact of lifestyle on radiotherapy outcomes and toxicities.

FPG is planning to exploit the iHelp framework and outcomes in its master "Big Data and value generation in biomedical research and clinical practice" by sharing the potential of such approach in everyday clinical practice.

5.12 Hospital de Dénia-MarinaSalud (HDM)

As a hospital and member of the Spanish public health services, Marina Salud will not exploit any market asset in the way of selling any product or service that results in a monetary revenue.

Besides that, the exploitation plan of Marina Salud could be divided in two main lines:

- Medical outcomes: based on the technology developed in iHelp, we would be able to improve the medical indicators regarding pancreatic cancer, from the identification of risk factors and early detection to the recommendations and treatments for diagnosed patients. All these would let us to reduce the impact of the disease over our population.
- Reputational outcomes: the participation in iHelp could bring future opportunities considering the involvement in future funded research collaboration/projects, based on the gained experience in the context of innovative cancer related projects. On the other hand, our participation and medical outcomes obtained following the iHelp project, will be disseminated and advertised that may motivate more patients to choose Marina Salud as their reference medical Centre.

5.13 Karolinska Institutet (KI)

KI as an academic partner will exploit the project results by disseminating the results in master lectures to introduce students to for example data visualization techniques.

KI organizes seminars on topics related to health research at least once per year where the results of iHelp may be disseminated. These seminars are attended by researchers, clinicians and hospital staff as well as students that might be interested in the iHelp results.

5.14 Medical University Plovdiv (MUP)

Medical University Plovdiv (MUP) is Medical University with about 6000 students. The University is a leader into the postgraduate specialization and resident programs for more than 32 medical specialties. One of the main objectives of the MUP that concern the amelioration of the medical education is the implementation of the latest achievements of the Information and Communication Technologies (ICT) into undergraduate and postgraduate students' curricula.

The MUP University hospitals are healthcare providers to the majority of the Southern Bulgaria population and are in constant move towards implementing the world best clinical practice and new technical and medical equipment, in order to grant to the patients the possible hospital treatment and faster and when possible full recovery.

MUP plans to exploit the project results by disseminating the results among the medical community via organizing iHelp presentation through lectures to the members of the Bulgarian Medical Association, as well as to the members of the National scientific medical associations for general (family) medicine, internal medicine, general and abdominal surgery, gastroenterology, oncology and endocrinology. During these presentations the objectives, tasks and achievements of the project will be disseminated.

When the platform for early detection is ready to be implemented into the practice it will be introduce to the academic staff of the MUP in order the platform to be included into the students' practical exercises of the mentioned medical disciplines. The results of the practical evaluation of the platform will be again presented to the National Scientific Medical Association, in order the clinicians to be introduced with the platform capabilities to ease, facilitate and increase the efficiency of the early detection and prevention of the Pancreatic cancer development, as well as to support their decisions regarding the diagnostic tests and consultations required for rapidly evaluation of the already started malignant process.

A focused activities are planned for communication with the general practitioners and internal medicine medical specialists for their pivotal role into the patients at risk early detection and monitoring, where the iHelp will bring valuable input.

The well-established communication with the Complex Oncology Centre Plovdiv will allow the project results to be disseminated and the platform to be introduced to the clinical oncologists that will highly appreciate this new powerful tool for increasing the effectiveness of the preventive and treatment protocols patients are advice to follow.

5.15 Taipei Medical University Foundation (TMU)

TMU will carry out methodologies and digital trials and adapt according to the healthcare ecosystems and needs. For iHelp, the main target sector will be the European countries. But after solidifying the presence in a European level, the next step involves an international expansion, especially in Asia that is considered one of the most densely populated regions for Cancer patients. This is where Taiwan can play a leadership role in the future. The user centric applications that will be developed by TMU for delivering personalized recommendations/decision-support and gathering vital health related data will be key to any personalized healthcare solution. The utilization and business prospects are wide ranging based on new business models that can harness the potential of mobile, wearable and social platforms. The results of the market analysis will feed into the requirements and architecture specification process in order to influence as early as possible the technical outcomes towards an exploitable solution. The ultimate aim for TMU will be to assist in this solution with scientific evidence achieved through iHelp.

6 Conclusion

Deliverable D8.5 is the first iteration of the exploration plans and it will be followed by two more iterations with deliverables D8.6 (M24) and D8.7 (M36). This report is the preliminary exploitation plan and presents the exploitation strategy, the joint exploitation approach, as well as the update of the partners' individual plans. The exploitation strategy is following a 3 phases-approach and is described with a list of key tasks, considerations and IPR handling practices. In its first year, the project has finished the first of the three phases, in which the Innovation Management activity (T1.3) that is linked with WP8 exploitation activity (T8.2), is capturing and monitoring the exploitation potentials of the project. Concerning the joint exploitation, the project foresees the overall iHelp solution to be the main result and the basis for joint exploitation and has considered from this early stage important parameters that will be help the smooth exploitation. Finally, the document includes the individual exploitation plans of all partners, describing their intentions for exploitation of iHelp outcomes.

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List of Acronyms

AI	Artificial Intelligence
ATC	Athens Technology Centre
CA	Consortium Agreement
D	Deliverable
DSS	Decision Support System
EC	European Commision
ENG	Engineering Ingegneria Informatica SpA
FHIR	Fast Healthcare Interoperability Resources
HDM	Hospital de Dénia-MarinaSalud
ICT	Information and Communication Technologies
IP	Intellectual Property
IPR	Intellectual Property Rights
ICE	Information Catalyst for Enterprise
iSPRINT	Innovation Sprint
KI	Karolinska Institutet
KOD	KODAR Systems
LXS	LeanXcale
MUP	Medical University Plovdiv
SIE	Siemens
TMU	Taipei Medical University
TRL	Technology Readiness Level
UNIMAN	University of Manchester
UPM	Universidad Politécnica de Madrid
UPRC	University of Piraeus Research Centre