



**Personal Healthcare  
Empowerment**

# Deliverable 5.4

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UPDATED EXPLOITATION PLANS

WP5 – Exploitation,  
T5.4 PHE Exploitation Strategy

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## Executive Summary

This deliverable is the result of T5.4, Exploitation. The main objective of this task was to seek exploitation of the project result, as well as to provide updated and detailed exploitation plans including go-to-market strategies.

For this purpose and based in the results coming from WP1 (specifically from D1.2), we have analysed what is the added value that PHE can provide to our clients and users, and it is described in section 1.

As a result of the project development, we have obtained not only PHE solution as a whole, but different exploitable assets developed by each partner that can also be exploited separately. All these results have been identified and described in section 4. In this way each partner has defined a business model and exploitations plans, described in sections 5 and 6.

All the work carried out in T5.4 has been compiled in this deliverable and aims a explaining our strategy to introduce the results coming from PHE project.

## 1 PHE Added Value

PHE provides a solution that empowers people to monitor and improve their health using personal data and technology assisted coaching. PHE analyses the user and generates personalized recommendations and goals related to their health and well-being in an intelligent way.

To this end, throughout the project we have focused on achieving the following objectives:

- Personalization: PHE is able to analyse different types of data from different sources, homogenizing them to generate a user profile in order to understand their strengths, weaknesses and provide recommendations and/or goals that best suit their preferences and needs.
- Monitoring & Analysis: Thanks to the monitoring and analysis module, as the user makes use of the application, we collect data that we are able to homogenize, analyse and translate into events. These events trigger the recommendations that the user will receive according to his needs and evolution.
- Coaching Framework as a preventive solution: The Coaching Framework developed comprises different modules capable of offering different but complementary services (described in D3.4). These services are aimed at different types of users. All these services are offered through a common API facilitating the exploitation of the Coaching Framework (Described in D3.5).
- PHE Open Architecture: The architecture developed for PHE and described in D3.3 is one of the strengths of our solution. Since it is not domain dependent, it allows to be used by 3rd parties and other projects.

## 2 Marketing Strategy

Some marketing tools might be:

- Website. With all My-TRAC products.
- Brochure.
- Social media.
- Advertisement. In targeted sectorial media.
- Direct communication with existing clients.

The material already created during PHE project dissemination can be used in the future for further and improved marketing strategy.

## 3 Exploitation strategy Introduction

The PHE exploitation strategy is based in 3 main pillars:

1. PHE solutions with a common architecture and API.

PHE has resulted in the development of different applications oriented to each of the cases of use considered which can be exploited separately. However, the services and functionalities they offer are contained in the common architecture, which as explained in D3.3 and mentioned above, can be exploited together through a common API.

2. Individual partners' interests

The individual partners' interests participating in the project should guide the exploitation strategy. The PHE business model has to be supported by the individual broad strategy of the project members in order

to assure investments. This latter exploitation will be explored communally but must still reflect each partner’s position. The consortium members detail their individual exploitation plans in this document.

### 3. Market context

The market context helps PHE partners to identify and evaluate opportunities for their exploitation, monitors other initiatives (commercial or research ones) and helps the project guide towards a strong market position regarding potential competitors. In order to develop a clear understanding of the market potential, a market analysis will be performed in this document.

#### 3.1 Exploitation Definitions

Some useful definitions related to the exploitation strategy are described in the below table.

Definition	
Exploitable Results	Project outputs studied and validated from the business point of view Data
Exploitable Knowledge	Methodologies and expertise that PHE partners have acquired during the project.
Reference Business Ecosystem	The different types of stakeholders who interact to implement, deliver and make use of the solution on the market.
Reference Business Model	The business models of the different types of stakeholders in the ecosystem, as they are now and as they should evolve due to implementation of the PHE solutions.
Business Idea	The business idea is a potential new business, based on PHE solutions that the partners intend to explore for potential exploitation on the market. The business idea can be explored by a single partner or jointly by a group of PHE partners who would like to exploit it together.
Exploitation Plan	The exploitation plan describes the strategy, goals, commercial and financial plan for the exploitation of a Business Idea. The exploitation plan is a concrete implementation plan of the Business Idea.

Table 1. Exploitation definitions

## 4 Exploitable Results

In this section the Exploitable assets of PHE are detailed and are divided in:

- PHE Exploitable results, that list the project outcomes.
- PHE Exploitable knowledge, that list the methodologies and expertise that the partners have acquired.

#### 4.1 PHE Exploitable Results

The list of the project results identified by PHE partners is listed in the following table

ID	Exploitable Result	Description	Involved Partner
R01	Reference architecture for interoperability	The proposed architecture facilitates the interoperability,	CINTESIS, MEDIDA, GECAD

		incorporating diverse data sources and coaching services	
R02	Anonymized Respiratory sounds database from CORD patient	Resulting from the pilots of the CORD usecase, would allow future research	CINTESIS
R03	Mobile technologies for CORD monitoring	As part of the Portuguese consortium project AIRDOC include licensable technologies and the base for innovative health services	MEDIDA
R04	Patient modelling framework for Musculo Skeletal Disease	The proposed model based on literature allows categorising patients into 6 profiles. This further opens opportunities to provide versatile coaching programs.	IDEWE, KU Leuven
R05	Visualisation and explainable recommendation techniques	Visualisations of user progress and explanation of recommendations facilitate the efforts to increase user engagement and trust.	KU Leuven, IDEWE
R06	Rules Editor	Rules Editor developed for CORD Management Use-Case	ISEP/ GECAD
R07	Coaching Plans	Interface to manage different Coaching Plans for CORD Management Use-Case	ISEP/ GECAD
		Interface to manage different Coaching Plans for healthy workspace use case	KU Leuven, IDEWE
R08	FHIR Parser	Parser developed to translate data under FHIR Format	ISEP/ GECAD
R09	Web & Mobile applications for pain monitoring	ARD HEALTH application offers two different suggestion systems, Rule-based and Prediction models: the first recommendation system is the rule-based expert suggestion system. The second is the prediction model suggestion system.	ARD
		IDEWE mobile app and dashboard offers pain monitoring capabilities for both employees and health coaches	KU Leuven, IDEWE
R10	Learning Engine	If the machine learning option is enabled for a coaching event, ARDHEALTH starts this prediction model to connect the internal or external engine and report	ARD

		recommendations returned by this engine.	
R11	Stream-based data monitoring and Analytics System	A health data monitoring system based on a stream management approach that uses a message broker to provide asynchronous service-to-service communication between different components of the system.	MANTIS
R12	Event-based data monitoring and Analytics System	A health data monitoring system based on serverless architecture that uses FaaS technology to provide synchronous service-to-service communication between different components of the system.	MANTIS
R13	Data-driven Coaching Engine	An independent application that generates machine learning models for any event or recommendation defined in the coaching framework.	MANTIS
R14	FaaS Cloud Computing	The analysis system and the coaching engine are integrated into an event-based cloud computing platform that enables them to communicate with each other and with the coaching framework. As the platform has been deployed on an automated scaling management system, the resources can be managed automatically depending on the workload.	MANTIS
R15	Health & Wellbeing Application	Mobile application that can be used as means of communication for companies to enhance employees health and make available their occupational health services. Additionally the app can evaluate the health and wellbeing user status, provide personalised recommendations, monitor their advances and accompany them on their health and wellbeing path. This solution also promotes employees' health, generate engagement and inform the employees about the company's health plans.	EXPERIS
R16	Recommender Algorithm	Access to personalized x-type recommendations based on user and peer preferences	EXPERIS, KU Leuven

R17	Dynamic Clustering Module	Allows to offer services in a personalized way and to accompany the user in their advances/progress.	EXPERIS
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#### 4.2 PHE Exploitable Knowledge

The list of the knowledge produced during PHE is listed in the following table

ID	Exploitable Knowledge	Description	Involved Partner
Kw01	FHIR (Fast Healthcare Interoperability Resources) experience	New experience and knowledge on FHIR was acquired by the human resources involved	MEDIDA, CINTESIS, GECAD
Kw02	Guideline-based recommendations for CORD to be used in knowledge base of CDSS	As part of the Portuguese consortium project AIRDOC are the clinical base for innovative health services	MEDIDA
Kw03	xamarin	New experience and knowledge on xamarin was acquired by the human resources involved	MEDIDA, CINTESIS
Kw04	Questionnaire-based patient profiling for Musculo Skeletal Disease	New experience and knowledge on questionnaire-based patient profiling for Musculo Skeletal Disease was acquired	IDEWE, KU Leuven
Kw05	Hybrid recommendation techniques	New experience and knowledge on hybrid recommendation techniques in the healthcare context, including rule-based and knowledge-based recommendations, are acquired.	KU Leuven
Kw06	Drools Recommender System	Knowledge acquired on Drools Framework which was used to develop the Rules Editor	ISEP/ GECAD
Kw07	AngularJS	New experience and knowledge on AngularJS	ARD
Kw08	Random Forest Algorithm	New experience and knowledge of the learning system	ARD, KU Leuven
Kw09	Event-based data monitoring	Serverless architecture using FaaS technology for data monitoring	MANTIS

Kw10	Column-oriented DBMS for data monitoring and analytics	Using Cassandra for data monitoring & analytics in a serverless environment	MANTIS
Kw11	Search engines for data monitoring and analytics	Using Elasticsearch for data monitoring & analytics in a stream management system	MANTIS
Kw12	Online scalable learning	Online learning approach with automatic scalability on a cloud environment	MANTIS
Kw13	React Native and different libraries	A framework for building native apps using React.	EXPERIS
Kw14	Artificial Intelligence techniques	Different types of artificial intelligence technologies have been studied to develop the Recommender. Finally mahout was used for this purpose allowing us to increase our knowledge on it.	EXPERIS
Kw15	Google Fit connexions	Google Fit was used to acquire external data, allowing us to understand how to connect our tool to Google devices	EXPERIS
Kw16	Rule-based recommendations	A rule-based engine uses predefined rules which are predictable, explainable, and close to the decisions made by healthcare experts.	KU Leuven

## 5 Business Model Canvas

The PHE project entails several exploitable results that can provide value for actors in the health and wellbeing ecosystem. The exploitable results have been categorised in order to enable a business model canvas creation for each.



### 5.1 PHE Business Canvas

Key Partners	Key Activities	Value Propositions	Customer Relationships	Customer Segments
<ul style="list-style-type: none"> <li>• Research Institution</li> <li>• Healthcare Institutions</li> <li>• Large Human Resources Enterprises</li> <li>• Hospitals &amp; Care Centres</li> <li>• Health Influencers</li> </ul>	<ul style="list-style-type: none"> <li>• Learning about customers</li> <li>• Constant research of competitors</li> <li>• Understand customers' needs</li> <li>• Technology monitoring</li> <li>• Marketing strategy</li> <li>• Dissemination</li> </ul>	<ul style="list-style-type: none"> <li>• Innovative Architecture ecosystem that allows 3<sup>rd</sup> parties to exploit the services needed.</li> <li>• Monitoring and Analytics Module that processes data and detect events</li> <li>• Coaching Framework that provides services (recommendations / coaching plans) based users profile / events.</li> </ul>	<ul style="list-style-type: none"> <li>• Added value product provided to right customers (B2B)</li> <li>• Attendance to Fairs</li> <li>• Special offers to companies with high-rate of e-work</li> <li>• Free trials to caregivers</li> </ul>	<ul style="list-style-type: none"> <li>• Large enterprises</li> <li>• mHealth companies</li> <li>• Pharmaceutical companies</li> <li>• Clinical devices manufacturers</li> <li>• Health insurers</li> <li>• Health care providers</li> <li>• Patient and caregivers</li> </ul>
	Key Resources		Channels	
<ul style="list-style-type: none"> <li>• Knowledge</li> <li>• Technologies</li> <li>• Existing infrastructure</li> </ul>		<ul style="list-style-type: none"> <li>• Direct contact and eternal &amp; internal collaborators</li> <li>• Online stores</li> <li>• Pharmacies</li> <li>• Healthcare webpages</li> <li>• Patient associations</li> </ul>		
Cost Structure			Revenue Streams	
<ul style="list-style-type: none"> <li>• Human resources</li> <li>• Research and development</li> <li>• Marketing and sales</li> <li>• Expertise input</li> </ul>			<ul style="list-style-type: none"> <li>• Licensing technologies and fees (several payment options)</li> <li>• Additional maintenance fees</li> </ul>	



## 5.2 EXPERIS Business Canvas

Key Partners	Key Activities	Value Propositions	Customer Relationships	Customer Segments
<ul style="list-style-type: none"> <li>Occupational and Health Department.</li> <li>Current customers who have interest in our solutions</li> </ul>	<ul style="list-style-type: none"> <li>Learning about customers</li> <li>Constant research of competitors</li> <li>Understand customers' needs</li> <li>Technology monitoring</li> <li>Marketing strategy</li> <li>Dissemination</li> </ul>	Personalised tool that studies the health and wellbeing status of its workers and provides the information and recommendations needed to improve their current status.	Direct relationships with current clients and internal departments.	<ul style="list-style-type: none"> <li>Any company willing to improve their workers health and wellbeing.</li> <li>Companies who may use IT solutions to provide personalized recommendations.</li> </ul>
	Key Resources			
	<ul style="list-style-type: none"> <li>Knowledge acquired</li> <li>Existing infrastructure within the company</li> <li>Occupational Department</li> </ul>		<ul style="list-style-type: none"> <li>Internal salesman</li> <li>Internal portfolio</li> </ul>	
Cost Structure			Revenue Streams	
<ul style="list-style-type: none"> <li>Cost of development</li> <li>Maintenance cost</li> <li>Human capital</li> <li>Marketing</li> </ul>			<ul style="list-style-type: none"> <li>Licensing</li> <li>Annual Subscriptions to our services</li> <li>Reduction of absenteeism</li> </ul>	



### 5.3 MEDIDA Business Canvas

Key Partners	Key Activities	Value Propositions	Customer Relationships	Customer Segments
CINTESIS Mask-air CUF Porto AstraZeneca GECAD	Develops, assesses and distributes products and services addressed towards people with chronic diseases, especially to allergic or with respiratory problems patients	<ul style="list-style-type: none"> <li>• Low-cost, high-quality prospective data for better clinical decisions</li> <li>• Innovation of CORD healthcare</li> <li>• Increased patient involvement and empowerment</li> <li>• Contribute to more efficient and sustainable healthcare</li> </ul>		<ul style="list-style-type: none"> <li>• Clinical Devices manufactures</li> <li>• -Health insurers</li> <li>• -Health care providers (Physicians, clinics, hospitals)</li> <li>• Patients and caregivers</li> </ul>
	Key Resources	Channels		
	<ul style="list-style-type: none"> <li>• International experience licensing technologies</li> <li>• Experience in testing apps with end users</li> </ul>	<ul style="list-style-type: none"> <li>• Direct contact and external collaborators B2B</li> <li>• Online stores</li> <li>• Pharmacies</li> <li>• Healthcare webpages</li> <li>• Patients Associations</li> </ul>		
Cost Structure			Revenue Streams	
<ul style="list-style-type: none"> <li>• Human resources</li> <li>• Research and Development</li> <li>• Marketing and sale</li> </ul>			<ul style="list-style-type: none"> <li>• Innovative health services</li> <li>• Licensing technologies</li> </ul>	



### 5.4 CINTESIS Business Canvas

Key Partners	Key Activities	Value Propositions	Customer Relationships	Customer Segments
MEDIDA VirtualCare EITHealth GECAD	<ul style="list-style-type: none"> <li>Development of new methodologies, tools and technologies regarding data collection and analysis</li> <li>Human resources advanced training</li> <li>Dissemination of science in the society</li> </ul>	<ul style="list-style-type: none"> <li>Innovation of CORD healthcare</li> <li>Contribute to more efficient and sustainable healthcare</li> </ul>		<ul style="list-style-type: none"> <li>Clinical Devices manufactures</li> <li>Health insurers</li> <li>Health care providers (Physicians, clinics, hospitals)</li> <li>Patients and caregivers</li> <li>Clinical Devices manufactures</li> <li>Clinical Devices manufactures</li> </ul>
	Key Resources	Channels	<ul style="list-style-type: none"> <li>Health care providers (Physicians, clinics, hospitals)</li> <li>Patients Associations</li> </ul>	<ul style="list-style-type: none"> <li>Health care providers (Physicians, clinics, hospitals)</li> </ul>
Cost Structure			Revenue Streams	
<ul style="list-style-type: none"> <li>Human resources</li> <li>Research and Development</li> </ul>			<ul style="list-style-type: none"> <li>Consulting services and contracted researching in new competencies acquired</li> </ul>	



### 5.5 KU Leuven Business Canvas

Key Partners	Key Activities	Value Propositions	Customer Relationships	Customer Segments
IDEWE	<ul style="list-style-type: none"> <li>Development of questionnaire-based patient modelling framework for Musculo Skeletal Disease</li> <li>Development of a hybrid approach to provide personalised recommendations for patients.</li> <li>Dissemination of scientific outputs in the community</li> </ul>	<ul style="list-style-type: none"> <li>Contribute to the prevention of absenteeism at work due to musculoskeletal pain.</li> <li>Contribute to a better workspace health empowerment</li> </ul>		<ul style="list-style-type: none"> <li>Health insurers                             <ul style="list-style-type: none"> <li>Health care providers (Physicians, clinics, hospitals)</li> <li>Patients and caregivers</li> </ul> </li> <li>Employers</li> </ul>
	Key Resources	Channels	<ul style="list-style-type: none"> <li>Experience in setting up a healthy and safe working environment.</li> <li>Experience in motivational techniques to increase user engagement.</li> <li>Experience in user-centred evaluations.</li> </ul>	
Cost Structure		Revenue Streams		
<ul style="list-style-type: none"> <li>Human resources</li> <li>Research and development</li> </ul>		<ul style="list-style-type: none"> <li>Smart prevention and well-being services for organisations</li> <li>Consulting and training services</li> </ul>		

### 5.6 GECAD Business Canvas

Key Partners	Key Activities	Value Propositions	Customer Relationships	Customer Segments
MEDIDA CINTESIS	<ul style="list-style-type: none"> <li>Development of Intelligent Systems.</li> <li>Dissemination of scientific outputs in the community</li> </ul>	<ul style="list-style-type: none"> <li>Innovation of CORD healthcare</li> <li>Contribute to more efficient and sustainable healthcare</li> </ul>		
	<b>Key Resources</b> <ul style="list-style-type: none"> <li>Experience and knowledge in the development and application of artificial intelligence techniques to real problems.</li> <li>Experience in Multi-agent systems, machine learning, data mining, intelligent interaction, ontologies and knowledge representation, meta-heuristics and optimization techniques are some of the relevant areas of specialization</li> <li>-Team know-how, merging academic and technological perspective</li> </ul>		<b>Channels</b>  Direct contact and external collaborators in academy	<ul style="list-style-type: none"> <li>-Clinical Devices manufactures</li> <li>-Health insurers care providers (Physicians, clinics, hospitals)</li> <li>Patients and caregivers</li> </ul>
<b>Cost Structure</b>		<b>Revenue Streams</b>		
<ul style="list-style-type: none"> <li>Human resources</li> <li>Research and development</li> </ul>		<ul style="list-style-type: none"> <li>Participation in projects aimed at creating and implementing innovative solutions and services for end users.</li> </ul>		



### 5.7 ARD Business Canvas

Key Partners	Key Activities	Value Propositions	Customer Relationships	Customer Segments
MANTIS & ARD	Development of intelligent Learning System	Offer suggestions that will encourage people to eat and live healthily.	Lawyers	Employers
	Key Resources		Channels	
	<ul style="list-style-type: none"> <li>• Experience and knowledge in the development and application of machine learning techniques</li> <li>• Machine Learning models, the recommendation for healthy workplaces</li> <li>• Application development proper to the health sector</li> </ul>		Direct contact and external collaborators	
Cost Structure		Revenue Streams		
<ul style="list-style-type: none"> <li>• Human resources</li> <li>• Research and Development</li> </ul>		<ul style="list-style-type: none"> <li>• Intelligent coaching systems services for organizations</li> </ul>		

## 6 PHE individual partners exploitation plans

This section describes the individual exploitation plans of the relevant PHE partners in the exploitation strategy.

EXPERIS	
Organization Background	Experis Solutions accompanies clients in a process of Transformation born from the perfect symbiosis between people and innovation. Experis provides unique and innovative solutions for talent and technology to be the change lever our clients company.
Market Overview	Manpower is an international company dedicated to human resources where the occupational health department is key. In particular Experis Solution operates in 54 countries
Exploitable results & knowledge	Health and Wellbeing solutions that will be used internally. Additionally we have acquire knowledge in Reach Native, a recommender algorithm and a dynamic clustering modules that could be offered as services or solutions to Experis current customers.
Business objectives	Increase our knowledge and expertise in React Native, AI technologies, , in order to include this technologies among the innovation solutions offered by Experis to its customers. Also to exploit the solution internally and open the door licensing it to other companies in the future.
Exploitation Strategy	Train our commercials and developers in new technologies to be able to exploit the results obtained and promote them. Include the results in our portfolio and offer them as an additional service to our current and future clients.
MEDIDA	
Organization Background	MEDIDA is a University of Porto spin-off, dedicated to Medicine, Education and R&D that started in 2007 within CINTESIS (Center for Health Technology and Services Research), a research unit based at Porto University Medical School. It is a small company that aims to (i) improve the quality of healthcare through R&D&I and (ii) to improve the quality of life of patients with respiratory and allergic diseases by providing personalized healthcare services and solutions. MEDIDA received recognition by the Portuguese government agency for innovation (ANI), within the SIFIDE (Tax Incentive System for Business R&D) Program, as a credited company for research and development services in the domains of health and of information and communication technologies applied to health. MEDIDA develops, evaluates and delivers services and products for patients with chronic diseases, especially for respiratory and allergic diseases. It holds several innovative products, such as ENO.VIS, CARAT, and INSPIRERS (Inspirermundi and ARCADE apps). ENO.VIS is a web-based decision support system to help with the interpretation of exhaled nitric oxide at the point of care (a version of the tool is still available at feno.med.up.pt). Two very successful projects of development, evaluation and dissemination of patient-reported outcomes (PRO) are CARAT (Control of Allergic Rhinitis and Asthma Test) and CARATkids (for children between 6 and 12 years old). MEDIDA holds the

	<p>rights of these PRO, representing its authors. These PRO have been cultural-adapted and implemented in more than 20 countries in 4 continents. Since 2012 MEDIDA has developed and launched five mobile apps for patients (currently two available) and collaborated in the design or evaluation of four other mobile health projects (for asthma, rhinitis, diabetes and rheumatoid arthritis). Currently, INSPIRERMUNDI, an app for improving the adherence to inhaled treatments using image processing technology and gamification concepts is the company’s showcase of mobile technologies. Since 2009, MEDIDA provides clinical services at CUF Porto Hospital and Instituto that remains the primary activity of the company. MEDIDA is responsible for the respiratory physiology labs and allergy care services at these leading private healthcare providers in Porto, Portugal. It has the collaboration of 8 doctors, 3 respiratory physiologists and one pharmacist. At these services, MEDIDA has been able to participate in clinical research projects, 9 from pharmaceutical industry, 2 from academia and 3 led by MEDIDA.</p>
Market Overview	<p>Currently, the management and treatment of different diseases only comprises ¼ of the existing mHealth applications and CORD related mHealth applications represent less than 10% of the total number of apps available in medium to high income countries. Most of the available apps in the context of CORD management are either informative/educational or serve as guides towards healthcare professionals and just a few allow screening of current health condition. Related to asthma, the proportion of applications aligned with international orientations is low (around 25%) and most only provide basic information related with the disease (50%) or diary-like functionalities (24%).</p>
Exploitable results & knowledge	<p>Reference architecture for interoperability of data sources , New FHIR experience, CORD specific rules for clinically based recommendations, mobile technologies for CORD monitoring</p>
Business objectives	<p>To license technology for self-monitoring using smartphone with no external devices and to propose an implementing healthcare services using the integrated system</p>
Exploitation Strategy	<p>The airdoc technologies will of being used in: (short-term) 1) an app for severe asthma to be used in Astrazeneca Portugal initiatives; 2) an app for blood pressure monitoring of a Portuguese study on hypertension; (long-term) Mask-air app and other international consortia</p>

### CINTESIS

Organization Background	<p>CINTESIS – Center for Health Technology and Services Research is Research &amp; Development Unit (R&amp;D) whose mission is to find answers and solutions, in the short term, to relevant health problems, without ever losing sight of the cost-benefit ratio. Hosted at the University of Porto, its multicenter, decentralized and flexible nature grounded in 46 partner institutions (29 Higher Education institutions, 12 hospitals/health institutions and 5 health companies) and 8 Higher Education institutions acting as hubs, namely, 5 universities (University of Porto, Nova University of Lisbon, University of Aveiro, University of Algarve, University of Madeira) and 1 Polytechnic Institution (Nursing School of Porto). Altogether, the center aggregates over</p>
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	500 researchers, in 24 research groups working in 3 main thematic lines: Preventive Health and Societal Challenges (TL1), Clinical and Translational Research (TL2), and Health Data and Decision Sciences & Information Technologies (TL3). The mission is to promote and integrate basic, clinical, and applied research, with the objective of accelerating the cycle of translation research, namely through the improvement of technology transfer to health and /or healthcare innovation sectors.
Market Overview	Health services companies (pharmaceutical, device manufacturers, software companies) that can required contracted research or consulting services.
Exploitable results & knowledge	Reference architecture for interoperability of data sources, New FHIR experience, Anonymized Respiratory sounds database from CORD patient
Business objectives	Contracted research and consulting services. Enhancing Human Resources, production of master/ PhD thesis, Publishing and Presenting articles in full text scientific meetings.
Exploitation Strategy	Include in the working team students of several levels, propose thesis in the framework of the project, organize and participate in events allowing dissemination to several publics and attracting possible clients.

#### IDEWE

Organization Background	<p>Group IDEWE is the largest external service for prevention and well-being at work in Belgium. From 11 regional offices and with more than 870 qualified employees, we support more than 35,000 employers and 750,000 employees in creating a healthy and safe working environment.</p> <p>Vision and mission statement. "The IDEWE Group wishes to contribute to people's physical and psychological integrity, to prevent harming their living and working environments.</p> <p>In this way IDEWE and IBEVE want to create an important social added value by working towards greater employability for the adult population, reducing losses for the employer and society as a whole, improving the working climate and personal development of each individual employee, while controlling the various forms of environmental damage. The group acts in the conviction that reducing the number and scope of incidents contributes to the welfare of a society which places great value on improving the quality of life. Particular attention is paid here to the qualification, training and welfare of the organisation's own staff."</p> <p>ISO 9001 certified. To implement this quality policy, the IDEWE Group uses a quality management system in accordance with ISO 9001:2008. Where necessary and/or required, working methods to be applied are established in procedures. Because the employees are involved to the maximum here, they consider it their personal responsibility to know these procedures and apply the relevant standard documents.</p> <p>Services. Setting up a prevention policy involves more than just occupational medicine. It also covers the fields of safety, hygiene, psychosocial aspects, ergonomics and the environment. Together with you, the customer, the IDEWE Group offers the services that best meet your needs and wishes in</p>
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	<p>the context of the overall scenario. A high-quality package of services is then compiled, tailor-made to the customer, which covers different domains simultaneously in an integrated manner. In addition to support and advice, the IDEWE Group also offers training in all disciplines of health and safety at work. This training is provided at the customer's premises or in one of the IDEWE Group's regional training centres.</p> <p>The scientific research conducted by our KIR department (Knowledge, Information and Research) forms the foundation of our services. Insights resulting from past research projects offer inspiration for new studies. This allows us to guarantee our clients a constant flow of innovation.</p>
Market Overview	<p>IDEWE is most strongly represented in sector healthcare (22%), education (15%), offices (14%) and logistics &amp; retail (14%). Other sectors are: industry &amp; cleaning (13%), food (5%), government (4%), construction (4%), railways (4%); emergency services (2%), agriculture and horticulture (2%), rest (1%).</p>
Exploitable results & knowledge	<p>Knowledge and insights on prevention policy to reduce or prevent work accidents and occupational risks and to improve the general well-being of employees: risk analysis, risk management, company inspections, participation in the Committee for Health and Safety at the Workplace, policy support, management systems, safety-related behaviour, measurements, training, scientific, practice-based research and documentation</p>
Business objectives	<p>To create an important social added value by working towards greater employability for the adult population, reducing losses for the employer and society as a whole, improving the working climate and personal development of each individual employee, while controlling the various forms of environmental damage.</p> <p>Innovative, validated services. Scientific and practice-based research. Medical supervision, health promotion, psychosocial welfare, ergonomics, hygiene</p>
Exploitation Strategy	<p>Bringing the new and innovative service on pain monitoring and management to the market (clients from different sectors suffering from pain and physical complaints). The new service will be integrated in our current services and systems. PhD thesis in the framework of the project. Organise, participate, and publish scientific outputs in conferences and meetings.</p>

<b>KU Leuven (HCI)</b>	
Organization Background	<p>KU Leuven is a university, located in the centre of the historic town of Leuven in the Flemish part of Belgium. With more than 60.000 students during the academic year of 2019-2020 (<a href="http://www.kuleuven.be/prodstudinfo/50000050/dash.html">http://www.kuleuven.be/prodstudinfo/50000050/dash.html</a>), KU Leuven is the largest university in Belgium and the low countries. KU Leuven has a very long tradition as a centre for learning. Today, it is Belgium's largest and highest-ranked university and, founded in 1425, one of the oldest and most renowned universities in Europe. As a leading European research university and co-founder of the League of European Research Universities (LERU), KU Leuven offers a wide variety of international bachelor and master's</p>

programmes, all supported by high-quality, innovative, interdisciplinary research. The university boasts 14 campuses, spread across 10 cities in Belgium. KU Leuven will be hosting over 58,340 students in the academic year 2019-2020. It has Erasmus contracts with more than 400 European universities and international contracts all over the world.

The Augment Human-Computer Interaction (HCI) research group (<http://augment.cs.kuleuven.be>), involved in this project, is embedded in the computer science department of the KU Leuven. Research in the HCI group focuses on how people interact with information, relying on language technology, visualisation and computer graphics, and artificial realities. The group has an affinity for prototype-driven research methods and the user-centred design (UCD) process. Its research studies how end-users interact with personalised systems, such as recommender systems, personalised search, and targeted advertisement. The objective is to enable end-users to understand the rationale of such systems and to enable them to steer the personalisation process with input and feedback. The focus is on visualisation and interaction techniques, using the full spectrum of hardware from small mobile devices to large multi-touch displays. Application areas include learning analytics, precision agriculture, healthcare, media consumption, and digital humanities. While the group accommodates international researchers of diverse educational backgrounds, its engineering foundation colours its research profile as solution oriented. This explains the regular interaction with diverse industry partners, co-innovating recently in learning analytics, precision agriculture, healthcare, media consumption, and digital humanities.

Market Overview	Research and development focusing on how people interact with recommender and information systems in the domains of learning analytics, precision agriculture, healthcare, media consumption, and digital humanities.
Exploitable results & knowledge	Expertise in visualisation and personalised systems focusing on usability, user engagement and trust.
Business objectives	Innovation and research. Higher education. Publication and communication.
Exploitation Strategy	PhD theses in the framework of the project. Organise, participate and publish scientific outputs in conferences, meetings, and public demonstrations. Trainings in higher education courses.

### GECAD

Organization Background	GECAD, as a recognized entity in the scientific community, actively participates in projects aimed at creating and implementing innovative solutions and services for end users. It is the largest R&D unit established at Instituto Superior de Engenharia do Porto (ISEP) and has more than 70 researchers, 20 of whom have PhD. GECAD has relevant knowledge in the application of artificial intelligence techniques to real problems. Multi-agent systems, machine learning, data mining, intelligent interaction, ontologies
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	and knowledge representation, meta-heuristics and optimization techniques are some of the relevant areas of specialization. The recognition of GECAD is visible in several indicators, such as the more than 60 national and international R&D projects in which it participated and through dozens of annual publications of articles, as well as special issues in the most accredited international scientific journals in the areas of activity of GECAD.
Market Overview	Aware of its social responsibility, GECAD aims to assist in the research and development of "Intelligent Systems to support a Sustainable, Safe and Inclusive Society". As such, the main focus of GECAD within the PHE project is the development of intelligent technologies, in which the development of the Coaching framework is inserted, encompassing a set of diverse functionalities capable of supporting users to acquire healthier habits in their daily lives. In addition, the development of this framework also assumes the definition and implementation of a generic architecture that can cover the different use cases of PHE as well as the development of various coaching services to allow access to the implemented features.
Exploitable results & knowledge	Expertise in development of Intelligent Systems. GECAD also has the capacity and interest to disseminate all the results achieved, having already made several publications in both scientific journals and conference proceedings which are related to the development of the Coaching framework and its functionalities within the context of the PHE project.
Business objectives	Innovation and research. Generate added value to the scientific community with regular scientific publications and other dissemination activities. Contribute to education with thesis and academic projects.
Exploitation Strategy	Support research and development of Master and PhD thesis as well as support academic projects and other relevant academic works. Regular scientific contributions on indexed journals and participation in conferences, meetings, and public demonstrations.

### ARD Group

Organization Background	ARD Group Informatics is one of the largest business partners of Vodafone Corporation for the publication of the projects that they developed and on cloud services and it uses Vodafone Cloud Technologies Base, which is the greatest data center of Vodafone Group in Turkey and the sixth greatest data center of Vodafone Group in the world. All software processes of ARD Group Informatics progress in compliance with ISO 15504 SPICE Level 2 standards which is the world software processes. Furthermore, data safety is prioritized by ISO 27001 information safety and facility safety certifications. Apart from that, ARD GROUP Informatics actively operates in Smart Solutions such as Smart Health, Smart City and Public Safety, Smart Energy, etc. provides end-to-end solutions within Turkey and Worldwide projects. Also, we collaborate with the giant vendors such as HITACHI as a VAR, Service Provider and System Integrator. Within the context of "Smart Cities", ARD Group Informatics produces "Smart Environmental Security System" solutions for institutions and organizations who's internal and external area security condition at critical level. ARD Group Informatics is actively involved in the studies related to Industry 4.0 in Turkey and takes
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part in the management board at the Industry 4.0 cluster. Therefore, we have a fund of knowledge of Industry 4.0. Also, we have completed as well as ongoing projects related areas on Semantic Web and IoT experiences. ARD Group Informatics also has important accomplishments in public law and security sector in Turkey with the biggest private sector judicial network project integrated with the national judiciary informatics system of Ministry of Justice, offering informatics services in a wide judicial spectrum from all legal authorities. Furthermore, it has developed UHAP-National Law Network Project, the second largest legal platform in Turkey, and has been rendering cloud service-provider services. We are serving customers in a global scale with the solutions such as IoT, Cloud, Big Data Analytics, Industry 4.0, development of IOS & Android applications and Smart Video Analytics. Having experiences in R&D, delivery & Project management for Government Agency, in the scope of Eureka; ITEA 2, ITEA 3 project calls and in the scope of European Commission Funds Horizon 2020' projects as well as national funded TUBITAK and KOSGEB projects. In last 5 years the ARD holding has been ranked in Deloitte's Technology Turkey list in first 10(ten) and in first 20(twenty) in EMEA region list of the fast-growing technology firms ranking. ARD GROUP is a well-known Key Actor in EU Projects Consortiums in its Region and acts as driving force in its Role. As Consortium member ARD Group has participated as the Country Coordinator on various Projects in its past and today.

Market Overview

ARD Group has been founded since 2006, by bringing large affiliate companies together within Turkey and the world market under an institutional identity. In the formation of Holding companies, which are gathered under the main headings of Information, Health, Defence, Energy, Construction and Consultancy. It is considered that these fields of activity are services with high threshold value, technological necessity and macro level value in Turkey. Designing projects for the state and private sector in Hacettepe University, Technocity with its two R&D offices and more than 50 expert engineers and software developers.

Exploitable results & knowledge

Secure communication techniques via mobile and web interfaces, competence in health advice systems, data analysis, storage, and data processing competence on cloud systems.

Business objectives

With the e-coaching application we have developed, we will offer suggestions that will encourage people to eat and live healthily. In this way, a structure that controls the risk of illness will be created and healthy workplaces will be obtained with an innovative approach.

Exploitation Strategy

By applying the project product to professional areas such as lawyers, thus monitoring the health of office workers and making suggestions and working more efficiently.

**MANTIS Software Company**

Organization Background

Mantis Software Company, which established in 2007 with its academic roots, adopts the principle of providing increasing added value to its customers and partners by investing in R&D for advanced technologies, innovative products, and services for the business solutions. Alongside its expertise in search

	<p>engines, information retrieval, data mining, image processing, decision support systems, social media analysis; Mantis has been specialized in the areas of software development and technical consultancy. The company has also been expanding its range of services thanks to developing international-business partnerships. Mantis aims to help build a better world by relying on creative thinking, focusing on R&amp;D, and using state-of-the-art technology in inventive projects. In addition to this, its responsibilities do not relate merely to the monetary gains. The goal of contributing to social welfare and development is part of our company ethics. Mantis coordinated and successfully completed more than 4 national projects, such as "Mantam", "Mansad", "Manses", "Mantoloji" and a Eurostars project entitled "Sakuwassa" so far. In Itea2, Mantis took place in eight labeled projects and successfully completed "DiCoMa" (Disaster Control Management) and "ViSCa" (Virtualization of Smart CARds) Projects. Mantis has set its primary objectives as a leader in system solutions based on Machine Learning, Deep Learning, and Semantic Search Technologies in the field of smart health, education, and environment. In light of this, our technology-driven company is working to be a preeminent and respectable national and international organization that provides services suitable for its partners and customers.</p>
<p>Market Overview</p>	<p>Mantis has worked with many organizations in the field of health information management during its prior healthcare projects. As a result, Mantis has accessed a number of private healthcare groups in Ankara and Istanbul. Our experience shows that the private health sector in Turkey is more willing to join R&amp;D&amp;I projects with a view to improving healthcare delivery. In this project, Mantis aims to cover the private healthcare market in Turkey, which accounts for 41.61% of the total healthcare market.</p>
<p>Exploitable results &amp; knowledge</p>	<p>Monitoring &amp; analytics architecture based on the requirements and constraints of health-care systems with intelligent data mining capabilities</p>
<p>Business objectives</p>	<p>In this project, Mantis aims to cover the private healthcare market in Turkey, which accounts for 41.61% of the total healthcare market. Out of 630 private healthcare groups, including medical schools and private hospitals, 261 groups belong to Ankara and Istanbul, accounting for 41.43% of the total private market and 17.24% of the total market in Turkey. At this point, our objective is to present Mantis smart health-care solutions for this market. In addition, Mantis' technological solutions will make it possible to conduct cross-organizational learning that is of interest to the Mantis targeting market.</p>
<p>Exploitation Strategy</p>	<p>The project is in line with Mantis' main objective of providing smart health care systems. In addition, the provision of secure data mining for health care systems in a cross-organizational manner is a challenge for Mantis and a vision for the future. Mantis aims to take advantage of all the solutions proposed in the PHE project in its ongoing/future projects and publish them in prestigious academic journals, and to highlight Mantis in the smart health community.</p>

