

Deliverable 7.3

# **Stakeholder analysis**

WP7 – Dissemination, exploitation and sustainability of the project outcomes

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### Authors

Name: Chiara Zocchi (CTECH)

Lead contributor	10. CTECH
Other contributors	

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### **Executive summary**

D7.3 is the main outcome of the Task 7.2 "Stakeholder scoping and mapping" (M1-M18) and of Task 7.5 "Networking activities" (M12-M48) and the exploitation activities, both led by CTECH with the participation of all other partners (section 2).

The stakeholders' followed a (technological) intelligence based on a systematic methodology by CTECH (section 3).

The main results achieved were:

- <sup>(2)</sup> The release of this deliverable with the identification of the key players for in and around ONCOVALUE value chain (section 3.4).
- The KERs table and the access rights to them during and after project implementation (section 4.2)
- The list and description of networking actions done in the reference period (section 5).

Conclusions are in section 6.

### 1. List of abbreviations and definitions

Abbreviation	Definition
AI	Artificial Intelligence
СА	Consortium Agreement
СРС	Cooperative Patent Classification
DARWIN	Data Analysis and Real World Interrogation Network
D&C	Dissemination and Communication
EHDS	European Health Data Space
GA	Grant Agreement
KER	Key Exploitable Results
НТА	Health Technology Assessment
ІСТ	Information Communication Technology
ML	Machine Learning
MRI	Magnetic Resonance Imaging
NLP	Natural Language Process
ОМОР	Observational Medical Outcomes Partnership
PROMs	Patient-Reported Outcome Measures
QoL	Quality of Life
RCT	Randomized Controlled Trial
RWD	Real World Data
RWE	Real Word Evidence
VIP Quadrant	"Vision and Innovation Potential Quadrant ©"

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### 2. Introduction

This deliverable deals with:

- Task 7.2 "Stakeholder scoping and mapping" and focuses on the systematic stakeholder analysis and mapping, which have identified the most important organizations within and around the ONCOVALUE value chain as a common basis for the proper set up of dissemination, communication, networking and exploitation activities.
- Task 7.5 "Networking activities" and focuses on the connections with other relevant EU funded projects and initiatives, with the aim to set the base for follow-up exploitation of the project outcomes.

In M4 (March 2023), CTECH organized the online workshop #1 "*Basics of dissemination, communication and exploitation*", where all partners jointly defined and brainstormed about the relevant stakeholder categories for ONCOVALUE and defined a preliminary set of keywords useful for the stakeholder analysis. In M5 (April 2023), CTECH and all partners met again and finalized together the definition of the most representative keywords.

A mapping of the relevant stakeholders, i.e., the groups outside the project who are affected in some way by the decisions and actions of the ONCOVALUE project, was made at EU level in M6-M8 (May-July 2023) by CTECH: preliminary and final results were presented to all partners in 2 plenary meetings held in M7 (June 2023) and in M8 (July 2023).

In parallel the exploitation activities started and in M10 (September 2023), CTECH circulated among partners a preliminary list of KERs. During the project meeting held in Milano in M12 (November 2023), CTECH held the (off and on line) workshop #2 "*The Key Exploitable Results*": after the presentation, all partners had the opportunity to exercise and brainstorm on the table of the KERs. This table was then improved and finalised during the exploitation monthly meetings of M13, M14, M15, M16 (December 2023, January-March 2024) and reported in this deliverable. In line with the beginning of Task 7.5 in M11 (October 2023), CTECH and TTOP started to contact 6 funded projects emerged from the stakeholder analysis and established connections with their coordinators and D&C experts, as described in this deliverable.

2.1 Relationship with other tasks

**Task 6.1 "Stakeholder scoping and mapping"** activities were basic inputs to gather additional information about all stakeholders (internal and external) interested in the training actions.

Initial Task 7.2's activities in M1-M9 (December 2022 – August 2023) were the inputs for the definition of the key target audiences in **Task 7.1 "Co-creation of the dissemination and communication plan"** and for the structuring of the Knowledge Hub in **Task 7.3 "Develop and establish the ONCOVALUE website (Knowledge Hub, social media and branding"**.

All Task 7.2's outcomes were inputs for **Task 7.4 "Communication, workshops, and dissemination activities"**, enabling the development and implementation of targeted dissemination actions to key stakeholders and early adopters of the ONCOVALUE innovations. This includes organisation and participation to workshops/events, publications in high impact journals, posters, lectures for students, academics, professionals. In addition, they will also be the basis for starting the **Task 7.7 "Technology Trend and Market Watch"** in M18 (May 2024).

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### 3. Stakeholder identification and analysis

#### 3.1 Methodology

The stakeholders' analysis is a form of (technological) intelligence that CTECH performs with the aim to identify the main players in a specific market segment or value chain, their role in that value chain, and their contribution to innovations, inventions or business in a particular sector.

The general methodology entailed desktop research based on extended data (public but clustered in private databases) and live action support for getting in touch with the stakeholders. It followed 3 main steps shown in **Virhe. Viitteen lähdettä ei löytynyt.** and described in the next sub sections.



Figure 1. The methodology. Keywords identification

In M4 (March 2023), CTECH organized the online workshop #1 "*Basics of dissemination, communication and exploitation*", where all partners jointly defined and brainstormed about the relevant stakeholder categories for ONCOVALUE (starting from the stakeholders identified in the GA section 2.2 and the D6.1 "Document on the training and education needs based on available training courses and gaps") and defined a preliminary set of keywords useful for the stakeholder analysis. In M5 (April 2023), CTECH and all partners met again and finalized together the definition of the most representative keywords.

Keywords were defined in terms of

- *Object* = process inputs, outputs and/or intermediate products.
- *Action* = action performed by the process on the object through the tool/solution used.
- **Tool** = technologies and solutions that allow to carry out the objectives of the challenge, being them already implemented or not.
- *Properties* = additional characteristics that the final object must have.

The identified keywords were combined by CTECH to create and launch different queries in different systems and proprietary databases.

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OBJECT	ACTION	TOOLS	PROPERTIES
Breast Cancer	Analysis	Algorithm	Systematic
Cancer	Assessment	Application Programming Interface	Accurate
Cancer Treatment	Automation	Artificial Intelligence	Affordable
Clinical Benefit	CAR T-cell Therapy	Cancer Health Registries	Compatible
Clinicians	Data Collection	Clinical Notes	Cost-effective
Colorectal Cancer (later stage)	Data Harmonisation	Clinical Study	Early Stage
Comorbidities	Data Processing	CT Scan	Effective
Disease Progression	Data Transforming	Data Analysis And Real-world Interrogation Network (DARWIN)	Efficient
Drug Discovery	Decision Making	Data Infrastructure	GDPR compliant
Genomic Data	Implementation	Data Network	Robust (linked to the AI)
Health Regulatory	Integration	Data Privacy Regulation	Interoperability
Historical Data	Management And Training	Data Source	Metastatic Stage
Imaging	Manual Data Entry	Double-arm Clinical Trial	Real-time
Laboratory	Medication	Electronic Medical Record (EMR)	Safe
Lesions	Novel Cancer Therapies	EMR System	Secure
Lung Cancer	Paper-based Data Entry	Health Technology Assessment (HTA)	
Medicine Agencies	Partially Structured Data Entry	Hybrid Data Entry	
Oncology	Personalised Cancer Care	Image Annotation	
Pathology	Pseudonymisation	Longitudinal Health Data	
Pharmacology	Regulatory	Machine Learning	
Prostate Cancer (later stage)	Standardised Data Collection	Medical Images	
Quality Of Life (Qol)	Standardised Methodologies	Meta Data	
Social Care	Treatment Management	Natural Language Processing	
Metastases	Data Registration	Omics Data Interoperability	
Metastatic Stage	Structured data collection	OMOP Common Data Model	
Tumour Characteristics	Value-based care	Oncology Patient Charts	
Cost	Value-based healthcare	Patient Registry	
Adverse events	Therapy	Patient Reported Outcome Measure (PROM)	
Advanced cancer		Patient Reported Importance Measures (PRIM)	
Improved Well- being		Radiology	
		Radiotherapy	
		Randomised Clinical Trial	
		Real-world Data (RWD)	
		Real-world Evidence (RWE)	
		Repositories	



Single-arm Clinical Trial	
Software	
Structured Data	
Text Analytics	
Federated analytics	
Unstructured Data	
Cost Data	
Text annotation	
Healthcare system	
Electronic health record	
Text mining	
Federated dashboard	
Federated infrastructure	
Image analysis	
Medical image analysis	

Table 1. ONCOVALUE keywords.

#### 3.2 Funded projects: research, selection and analysis

Funded projects represent a good gaze into the latest trends in innovation, as far as public funding is concerned. The scouted actors will be referred to as the "innovators" to be classified and analysed. This phase required intensive use of the CTECH IT tool Wheesbee (www.wheesbee.com). Such tool enables clustering and organising relevant public and private data sets, possibly defining an innovation scoreboard, innovation networks and strategic trends analysis.

#### 3.2.1 Boundaries

For the analysis of funded projects, the following **boundaries** were considered:

- Projects that had started as of **01/01/2016**.
- Projects funded by the **European Commission** or by **European national entities** (Italy, Belgium, The Netherlands, France, Germany, Norway, Finland, United Kingdom).
- **Consultation of specific European portal** (FET Open, Cordis) for the identification of further funded projects.

#### 3.2.2 Selection and analysis

**27** different queries were defined and trained in Wheesbee and as preliminary results:

- Almost all projects are related to « access to medical data platform (52 projects), assistance in performing diagnosis and prognosis (51 projects), collection and extraction of structured and unstructured data (49 projects), RWD (45 projects), big data (44 projects), AI (43 projects), RWE (43 projects), cancer treatment (41 projects), medical images data source (41 projects), AI-based medical image analysis (40 projects) »
- About half of the projects are related to « breast cancer (23 projects, 9 of which include the metastatic form), RCT (23 projects), Federated data network (22

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projects), NLP to process and pseudonymisation of clinical notes (22 projects), patient perspective data such as QoL, PROMs, and exit surveys (21 projects) »

- **Few projects** are related to « lung cancer (17 projects, 5 of which include the metastatic form), prostate cancer (14 projects, 4 of which include the metastatic form), drug development (14 projects), AI-based text analysis (12 projects), and colorectal cancer (11 projects, 7 of which include the metastatic form) ».
- **Very few projects** are related to «cancer screening (6 projects) and cybersecurity (2 projects) ».
- Almost all of the projects mentioned « *the possibility of exploiting other forms of unstructured health data outside the one specified in the projects* (50 projects) ».
- Possible fields of use: *Other types of cancer* (10 projects, 2 of which are directly related to female reproductive cancer), *radiomics* (5 projects), personalised medicine (4 projects), cancer registry (3 projects), skin cancer (2 projects), and rare cancer (1 project).

Some examples of queries are:

- ("Real World Data" OR "Real-world Data" OR "Real World Evidence" OR "Real-world Evidence") AND "Cancer"
- (("Breast Cancer" OR "Lung Cancer" OR "Metasta\* Cancer") AND ("Analysis" OR "Assess\*") AND ("Artificial Intelligence" OR "Machine Learning") AND ("Robust" OR "Cost"))

Based on these considerations, **66 EU Funded Projects** (including ONCOVALUE) were identified, out of which 28 are still ongoing. The corresponding total received funding was more than  $42 \text{ M} \in$  in the period 2016-2024.

Figure 2 shows the trend of the identified funded projects: the maximum peaks are in 2020 and 2021, with 30 projects with similar topics to ONCOVALUE, indicating the potential maturity of the innovation and technology sector. **European funding** got the most significant share with 26 funded projects in the selected timespan. For the national funded projects, **Norway** leads with 14 projects, while the UK and the USA funded 5 projects each: this data helps to circle in the geographical information of the source of funding, and might be helpful if at the end of the project, there is an idea to continue the development of the ONCOVALUE technology with other public funded projects.



Figure 2. A) Trend of the funded projects related to ONCOVALUE. B) Source of funding.



More specifically, 17 and 7 projects were funded within **H2020** and **HEU** programmes, see Figure 3.



Figure 3. Funding programmes distribution.

Top five participating countries, counted by the number of organisations partners of the selected public funded projects are (Figure 4): Norway (21), Germany (20), Spain (19), Belgium (19), The Netherlands (17), Italy (15).



Figure 4. Countries where partners from the selected funded projects are located.

The identified projects were further evaluated and ranked according to:

- Type of disease:
  - (Must have) Breast cancer, lung cancer, metastatic stage.

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- (Optional) Colorectal cancer, prostate cancer
- AI tools:
  - Medical image analysis
  - Text analysis
  - Collection / Extraction of Structured & Unstructured data
- Data source:
  - o RWD
  - o RWE
  - o RCT
  - o Image
  - Patient's perspective about QoL, PROMs, surveys...)
  - Other unstructured data
- Supporting aspects of:
  - Data connectivity: access to medical data platform / Federated data network / Queries & Analyses, OMOP
  - Data safety: NLP to process & pseudonymisation of clinical notes
  - Function: help with Assessment, Diagnosis, Prognosis.
- **Other features,** such as drug development.

Table 2 shows the **levels of correlation** (colored circles) between the identified projects and ONCOVALUE:

- Unrelated: the property is not considered in the project.
- Might be related to: the property is mentioned in the project but is not in the main scope of.
- Related: the property is a key factor considered in the project.

Based on these further grouping, **22 EU Funded Projects (excluding ONCOVALUE) were selected** as the most related to ONCOVALUE, out of which 17 are still ongoing.



PROJEC	T NAME			USE	CASES			DATA	TECHNOLOGY PROVIDED																		
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A multimodal Al-base	INCISIVE	0	0	0	0		-	Image annot		0	0	0	0		0	0	1	0	0	0		0		0	-	6	181,71
A mainframe solution	BIGMED			0			Rare dis	Genome ana					0				)							0		6	153,14
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A European Cancer I	EuCanimage	0		0	Q		Liver, D	t Cancer imag											0	0			_	0	-	6	137,62
DATA-LAN - The He	DATA-LAN						Children	Lancer datas															12	0		9 1	131,19
European Health Dat	EHDEN						Inflamm	Data standar					0							0		0	-	0	-	6	128,57
Uptimal treatment for							Persona	a HWU, Uynar		-													-		-	6	121,00
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Integrative science, Ir	I JLUNG						Metasta	Immunother										-							-	8	112,86
Integration and analy	IASIS			-			Dement	Platrorm, Big								-									-	8	110,29
Real-World-data Enac							LUPD,	4 Synthetic da															-		-	0	103,30
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Table 2 Identified projects: relations with ONCOVALUE.

Among the selected projects, the 15 more related projects were further grouped, according to the similarity of the cancer types and the technology developed in the projects (Figure 5): *INCISIVE "A multimodal AI-based toolbox and an interoperable health imaging repository for the empowerment of imaging analysis related to the diagnosis, prediction and follow-up of cancer"* is the most related one, followed by OPTIMA, ASCAPE, EuCanImage. CTECH started the networking activities with the project coordinators of these top ranked projects (see section 1).





Figure 5. Top 15 projects related to ONCOVALUE.

Some organizations have >3 participations in the selected funded projects (**Virhe. Viitteen lähdettä ei löytynyt.**). The "*Erasmus University Medical Center Rotterdam (NL)*", the "*European Cancer Patient Coalition (BE)*" and the "*Karolinska Institute (SE)*" are the organizations with the highest number of participations.



Figure 6. Organisations with at least 3 project participations.

The **project network analysis** (Figure 7**Virhe. Viitteen lähdettä ei löytynyt.**) shows the cooperation among the project participants of the selected projects. It is divided into several focus themes according to the organisation types and position in the ONCOVALUE value

ONCOVALUE - Implementing value-based oncology care at European cancer hospitals: An AI-based framework for assessing real-life effectiveness of novel cancer therapies in real-time (Project 101095245)





chain. The organizations of Figure 6 are in the center of the nodes, showing their connections to others.





Figure 7. Network analysis of the selected innovators (participants in the selected funded projects)

The number inside the circle describes the rates of project participation of the organization, while the number near the line means the frequency of the collaboration with other organizations. For example, *Erasmus University Medical Center Rotterdam* has 5 projects in its portfolio (cloud) and has collaborated twice with Maastricht University.

This information can be used to see which organisation plays a vital role in communication and influence, which organisation has experienced in research collaborations, etc.

ONCOVALUE - Implementing value-based oncology care at European cancer hospitals: An AI-based framework for assessing real-life effectiveness of novel cancer therapies in real-time (Project 101095245)

#### 3.3 Patents: research, selection and analysis

#### 3.3.1 Boundaries and selection

For the analysis of patents, the following steps were considered in a preliminary **funnel approach** on data (Table 3). The patent offices used as sources are Europe, USA, China, Japan, International.

Funnel	Description	#
		patents
Queries	<ol> <li>The chosen query must cover:         <ol> <li>Main Disease Focus – the query should be aligned with the key diseases being studied in the project. It should be specific enough to gather detailed information but not too narrow to miss related conditions that could provide valuable insights.</li> <li>Technological Functionalities – the query must consider the technology used and leverage it without overwhelming the system with irrelevant information.</li> <li>Economic Point of View – the query should display a cost-effective preference for the technology and the very problems it wants to solve.</li> <li>summary, the query should be general enough to encompass a comprehensive dataset that includes all relevant information for the diseases of interest. At the same time, it should be specific enough to exclude data that does not contribute to the understanding or treatment of these diseases, thereby avoiding the collection of unnecessary data that can lead to increased costs and inefficiencies. The balance between these two aspects is crucial for effective data-driven decision-making in healthcare.</li> </ol> </li> </ol>	8.452
Publication	1 Jan 2013 – 16 Mar 2023	4.976
Date from/to	a national family comprises a set of national applications that portain to identical	2 705
family	or comparable technical subject matter. The applications within this family are interconnected through priority claims.	3.705
Focus on Human	by prioritising human-centric approaches, we impose a constraint on patents that exclusively target treating human diseases with technological applications. Consequently, other patents that employ similar technologies but concentrate on their application in non-human mammals are excluded.	1.123
CPC selection	A61B (DIAGNOSIS; SURGERY; IDENTIFICATION); G06F (ELECTRIC DIGITAL DATA PROCESSING); G06N (COMPUTING ARRANGEMENTS BASED ON SPECIFIC COMPUTATIONAL MODELS); G16B (BIOINFORMATICS, i.e. INFORMATION AND COMMUNICATION TECHNOLOGY [ICT] SPECIALLY ADAPTED FOR GENETIC OR PROTEIN-RELATED DATA PROCESSING IN COMPUTATIONAL MOLECULAR BIOLOGY); G16H (HEALTHCARE INFORMATICS, i.e. INFORMATION AND COMMUNICATION TECHNOLOGY [ICT] SPECIALLY ADAPTED FOR THE HANDLING OR PROCESSING OF MEDICAL OR HEALTHCARE DATA); G06K (GRAPHICAL DATA READING (image or video recognition or understanding G06V); PRESENTATION OF DATA; RECORD CARRIERS; HANDLING RECORD CARRIERS); G06T (IMAGE DATA PROCESSING OR GENERATION, IN GENERAL [2006.01])	203
Top 10%	the patents were ranked according to their total value, which is calculated	37
Focus on	Dased on the lagged LFUS The previous 37 patents were further analysed and three of them were	34
related	determined to have an unrelated disease focus and were subsequently filtered	Эт
diseases	out.	

Table 3 CTECH funnel approach in the analysis of patents.



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As preliminary result, CTECH identified 3,705 patents grouped by family: the number of published patents peaked in 2019 with a total of 916 patents. Most of the patent application is registered in the USA.



Pubblication date Figure 8. Identified patents by publication date.

The following heatmap reports the distribution of the patents based on the CPCs (Figure 9): the top 3 CPCs emerged are:

- a. G06F Electric Digital Data Processing, (computer systems based on specific computational models G06N).
- b. G16H Healthcare informatics, i.e. Information and communication technology [ICT] specially adapted for the handling or processing of medical or healthcare data.
- c. C12Q Measuring or testing processes involving enzymes, nucleic acids or microorganisms (immunoassay g01n33/53); compositions or test papers therefor; processes of preparing such compositions; condition-responsive control in microbiological or enzymological processes.

<b>423</b>	<b>345</b>	<b>277</b>	<b>212</b>
G01N	G06T2207/20081	G06T7/0012	C12Q2600/118
<b>429</b>	<b>353</b>	<b>305</b>	<b>239</b>
C12Q	G06N	A61B	G06T2207/30096
<b>468</b>	<b>386</b>	<b>335</b>	<b>249</b>
G16H	G06T	G06К	C12Q1/6886
<b>577</b>	<b>394</b>	<b>340</b>	<b>251</b>
G06F	C12Q2600/158	G16B	G16H50/20
1	0	577	1

Figure 9. Heatmap of the patents by CPCs.



#### 3.3.2 Analysis of selected patents

The 34 selected patents (Table 4) have more correlation with respect to the technology developed and diseases under investigation by ONCOVALUE.

NO	Title (en)	ld	DISEASE	Priority	Publication	IPC	СРС	A61B	G06F	G06N	G16B	G16H	G06K	G06T	Category	Inventors	Applicants	Number of	Number of	Family
			FOCUS	claim date	Date	Classifica	Classifica											cited	citing	size
						tions	tions											patents	patents	
1	AUTOMAT	USA1/US20200085382	Neutral	30/05/2018	19/03/2020	A61B5/05,	G06N, G06	Х		Х		Х	Х	Х	Graphic, Diagnosis	AXERIO-CI	ARTERYS			1
2	SYSTEMS A	WOA1/2019104003	Neutral	21/11/2017	31/05/2019	G06N3/06	G06N3/08		Х	Х		Х		х	Data	KANG, AN	BETH ISRAEL DEACONESS	2	5	2
3	PREDICTIC	USA1/US20170193175	Neutral	30/12/2015	06/07/2017	G06T7/00,	G06N, G06		Х	Х		Х	Х	Х	Graphic	VELCHETI	CASE WESTERN RESERVE			1
4	DISTINGUI	USA1/US20190357870	Related	24/05/2018	28/11/2019	G06T7/00,	G06N, G06	Х		Х		Х	Х	Х	Graphic, Diagnosis	VAIDYA PF	CASE WESTERN RESERVE			1
5	PREDICTIN	USA1/US20190087532	Related	15/09/2017	21/03/2019	G06T7/00,	G06N, G06		Х	Х		Х	Х	Х	Graphic	VAIDYA PF	CASE WESTERN RESERVE			1
6	COMPUTE	USA1/US20170200270	Neutral	28/09/2009	13/07/2017	G06T7/00,	H04L, G06	Х	Х			Х	Х	Х	Graphic, Diagnosis	TRAMBER	D R SYSTEMS			1
7	RULES-BAS	USA1/US20170200269	Neutral	28/09/2009	13/07/2017	G06T7/00,	H04L, G06	Х	Х			Х	Х	Х	Graphic, Diagnosis	REICHER N	D R SYSTEMS			1
8	RULES-BAS	USA1/US20170200064	Neutral	28/09/2009	13/07/2017	A61B5/00,	H04L, G06	Х	Х			Х	Х	Х	Graphic, Diagnosis	TRAMBER	D R SYSTEMS			1
9	MULTIPLE	WOA1/2020182710	Neutral	12/03/2019	17/09/2020	G06T7/00,	G06T2207		Х	Х	Х	Х		Х	Data	GILDENBL	F. HOFFMANN-LA ROCHE	2	8	5
10	PREDICTIN	WOA1/2020131746	Related	17/12/2018	25/06/2020	G06K9/60,	G06T2207	х	Х	Х		Х		Х	Data, Diagnosis	GERTYCH,	GEORGIA STATE UNIVERS	3		2
11	Method ar	USA1/US20200066407	Neutral	23/02/2017	27/02/2020	G06T7/00,	G06N, G06		Х	Х		Х	Х	Х	Graphic	LIU YUN -	GOOGLE			1
12	METHOD A	WOA1/2018156133	Neutral	23/02/2017	30/08/2018	A61B8/08,	G06T2207,		Х	Х		Х		Х	Data	STUMPE, I	GOOGLE LLC	3	21	6
13	VIRTUAL S	WOA1/2019172901	Neutral	07/03/2018	12/09/2019	G06K9/00	G06T2207			Х		Х	Х	Х	Graphic	STUMPE, I	GOOGLE LLC	5	11	4
14	BREAST CA	USA1/US20190340756	Related	15/08/2017	07/11/2019	G16H40/6	G06T2207	Х	Х			Х	Х	Х	Graphic, Diagnosis	MEDINA R	IBM			1
15	BREAST CA	USA1/US20190057500	Related	15/08/2017	21/02/2019	G16H40/6	G06T2207	Х	Х			Х	Х	Х	Graphic, Diagnosis	MEDINA R	IBM			1
16	Automated	USA1/US20200160510	Neutral	20/11/2018	21/05/2020	G06T7/00,	G06N, G06		Х	Х		Х	Х	Х	Graphic	RICHMON	IBM			1
17	HANDPRIN	USA1/US20180082419	Neutral	20/09/2016	22/03/2018	G16B20/00	G06N, G06			Х	Х	Х	Х	Х	Graphic	FETZER ST	IBM			1
18	SYSTEMS A	USA1/US20190236782	Neutral	30/01/2018	01/08/2019	A61B5/05,	G06N, G06	Х	Х	Х		Х		Х	Data, Diagnosis	HADAD ON	IBM			1
19	Handprint	USB2/US10515448	Neutral	20/09/2016	24/12/2019	G16B20/00	G16B20/0		Х	Х	Х	Х		Х	Data	FETZER, ST	INTERNATIONAL BUSINE	13		2
20	Systems ar	USB2/US10580137	Neutral	30/01/2018	03/03/2020	A61B5/05,	G06T2207	Х	Х	Х		Х		Х	Data, Diagnosis	AMIT, GUY	INTERNATIONAL BUSINE	10	1	2
21	METHOD,	USA1/US20160012316	Neutral	10/07/2014	14/01/2016	G06T7/00,	G06T2207,	Х	Х			Х	Х	Х	Graphic, Diagnosis	GHOUTI L	KING FAHD UNIVERSITY O			1
22	SYSTEMS,	USA1/US20170358079	Neutral	13/08/2013	14/12/2017	A61B5/05,	G06T, A61	Х	Х			Х	Х	Х	Graphic, Diagnosis	PLEVRITIS	LELAND STANFORD JUNI			1
23	SYSTEMS,	USA1/US20160203599	Neutral	13/08/2014	14/07/2016	A61B5/05,	G06T, A61	Х	Х			Х	Х	Х	Graphic, Diagnosis	PLEVRITIS	LELAND STANFORD JUNI			1
24	ANOMALY	USA1/US20180033144	Neutral	21/09/2016	01/02/2018	G06T7/52,	G06N, G06		Х	Х		Х	Х	Х	Graphic	CHEN SEA	REALIZE	-		1
25	SYSTEMS A	WOA1/2018232388	Neutral	16/06/2017	20/12/2018	A61B5/05,	A61B6/524	Х	Х	Х		Х		Х	Data, Diagnosis	KRUGER, I	RENSSELAER POLYTECHN	3	6	9
26	CONTENT	USA1/US20170308656	Neutral	10/03/2016	26/10/2017	G06T15/00	G06N, G06		Х	Х		Х	Х	Х	Graphic	COMANIC	SIEMENS HEALTHCARE			1
27	CONTENT	USA1/US20170262598	Neutral	10/03/2016	14/09/2017	G06F, G06	G06N, G06		Х	Х		Х	Х	Х	Graphic	COMANIC	SIEMENS HEALTHCARE			1
28	IMAGE-BA	USA1/US20170357844	Neutral	09/06/2016	14/12/2017	G16H30/0	G06T2207,		Х		Х	Х	Х	Х	Graphic	COMANIC	SIEMENS HEALTHCARE			1
29	METHOD A	USA1/US20190221304	Neutral	12/01/2018	18/07/2019	G06T7/00,	G06N, G06		Х	Х		Х	Х	Х	Graphic	IONASEC F	SIEMENS HEALTHCARE	-		1
30	Image-bas	USB2/US10282588	Neutral	02/05/2017	07/05/2019	G16H50/5	G06T2207,				Х	Х	Х	Х	Graphic	COMANIC	SIEMENS HEALTHCARE G	7	7	4
31	AUTOMAT	WOA1/2018222755	Neutral	30/05/2017	06/12/2018	A61B5/05,	A61B5/055	Х	Х	Х		Х		Х	Data, Diagnosis	SALL, SEAN	TAERUM, TORIN, ARNI - J	8	30	4
32	DETERMIN	WO2020198380A1	Neutral	26/03/2019	01/10/2020		G06T2207,			Х	Х	Х	Х	Х	Graphic	YIP, STEPH	TEMPUS LABS, INC.	4	7	8
33	SYSTEM M	WOA1/2019104221	Related	22/11/2017	31/05/2019	G06T7/00	G06T2207,	Х	Х	Х		Х		Х	Data, Diagnosis	HA, RICHA	THE TRUSTEES OF COLUN	2	6	6
34	JOINT ANA	USA1/US20190362809	Neutral	08/07/2016	28/11/2019	G06N20/0	G06N, G16		Х	Х	Х	Х	Х		Data	OKIMOTO	UNIVERSITY OF HAWAII -			1

Table 4. Selected patents.

The **technology focus** of the selected patents is **quite distributed** among the categories (Figure 10).



Figure 10. Selected patents distributed by technology focus.

The selected patents are filled in by **18 applicants** (Figure 11): one of them, *Siemens Healthineers*, is one of the ONCOVALUE partners.



Figure 11. Applicants of the selected patents.

The applicant organisations were further classified (Table 5) according to their country of origin, turnover of year 2023 (whenever applicable), number of patents in the sector, type and expertise (position in the value chain). The predominant proportion of patent applicants is represented by **universities** (40%), followed by large corporations (25%). Although a

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significant majority (70%) of the patent applicants are based in the **United States**, there exists the potential to monitor their corresponding business activities in Europe. Given the dynamic nature of this document, updated and reports on additional potential stakeholders will be progressively incorporated throughout the project's lifecycle.

Applicant	Туре	#Patents in the Sector	Turnover (M€)	Country
ARTERYS	SME	3	7.40	USA
CASE WESTERN RESERVE UNIVERSITY	University	20	0.00	USA
<b>COLUMBIA UNIVERSITY</b>	University	10	0.00	USA
D R SYSTEMS	SME	3	21.20	Canada
IBM	Large Industry	53	57,190.00	USA
REALIZE	Start-up	3	0.70	USA
RENSSELAER POLYTECHNIC INSTITUTE	University	3	0.00	USA
SIEMENS HEALTHCARE GMBH	Large Industry	18	21,780.00	Germany
<b>UNIVERSITY OF HAWAII</b>	University	2	0.00	USA
ARTERYS	SME	3	7.40	USA
CASE WESTERN RESERVE UNIVERSITY	University	20	0.00	USA
<b>COLUMBIA UNIVERSITY</b>	University	10	0.00	USA
D R SYSTEMS	SME	3	21.20	Canada
IBM	Large Industry	53	57,190.00	USA
REALIZE	Start-up	3	0.70	USA
RENSSELAER POLYTECHNIC INSTITUTE	University	3	0.00	USA
SIEMENS HEALTHCARE GMBH	Large Industry	18	21,780.00	Germany
SNR ANALYTICS	SME	2	0.50	USA
<b>UNIVERSITY OF HAWAII</b>	University	2	0.00	USA

Table 5. Applicant organizations of the selected patents.

During the September monthly meeting with CTECH and partners, the 34 selected patents were analysed and further filtered (Table 6) considering the technologies applied and the diseases under considerations, providing additional scores (high, medium, low).



NO	Title (en)	Applicants	Score by
			ONCOVALUE
			partners
1	AUTOMATED LESION DETECTION, SEGMENTATION, AND LONGITUDINAL IDENTIFICATION	ARTERYS	high
2	SYSTEMS AND METHODS FOR AUTOMATICALLY INTERPRETING IMAGES OF MICROBIOLOGICAL SAMPLES	BETH ISRAEL DEACONESS	low
3	PREDICTION OF RECURRENCE OF NON-SMALL CELL LUNG CANCER	CASE WESTERN RESERVE	low
4	DISTINGUISHING MINIMALLY INVASIVE CARCINOMA AND ADENOCARCINOMA IN SITU FROM INVASIVE ADENOCARCINOMA WITH INTRATUMORAL AND PERI-TUMORAL T	CASE WESTERN RESERVE	high
5	PREDICTING RECURRENCE IN EARLY STAGE NON-SMALL CELL LUNG CANCER (NSCLC) WITH INTEGRATED RADIOMIC AND PATHOMIC FEATURES	CASE WESTERN RESERVE	medium
6	COMPUTER-AIDED ANALYSIS AND RENDERING OF MEDICAL IMAGES	D R SYSTEMS	medium
7	RULES-BASED PROCESSING AND PRESENTATION OF MEDICAL IMAGES	D R SYSTEMS	low
8	RULES-BASED RENDERING OF MEDICAL IMAGES	D R SYSTEMS	low
9	MULTIPLE INSTANCE LEARNER FOR PROGNOSTIC TISSUE PATTERN IDENTIFICATION	F. HOFFMANN-LA ROCHE	low
10	PREDICTING DCIS RECURRENCE RISK USING A MACHINE LEARNING-BASED HIGH-CONTENT IMAGE ANALYSIS APPROACH	GEORGIA STATE UNIVERS	low
11	Method and System for Assisting Pathologist Identification of Tumor Cells in Magnified Tissue Images	GOOGLE	low
12	METHOD AND SYSTEM FOR ASSISTING PATHOLOGIST IDENTIFICATION OF TUMOR CELLS IN MAGNIFIED TISSUE IMAGES	GOOGLE LLC	low
13	VIRTUAL STAINING FOR TISSUE SLIDE IMAGES	GOOGLE LLC	low
14	BREAST CANCER DETECTION	IBM	medium
15	BREAST CANCER DETECTION	IBM	medium
16	Automated Patient Complexity Classification for Artificial Intelligence Tools	IBM	medium
17	HANDPRINT ANALYSIS TO PREDICT GENETICALLY BASED TRAITS	IBM	medium
18	SYSTEMS AND METHODS FOR DETECTING AN INDICATION OF MALIGNANCY IN A SEQUENCE OF ANATOMICAL IMAGES	IBM	medium
19	Handprint analysis to predict genetically based traits	INTERNATIONAL BUSINE	medium
20	Systems and methods for detecting an indication of malignancy in a sequence of anatomical images	INTERNATIONAL BUSINE	medium
21	METHOD, SYSTEM AND COMPUTER PROGRAM PRODUCT FOR BREAST DENSITY CLASSIFICATION USING FISHER DISCRIMINATION	KING FAHD UNIVERSITY O	low
22	SYSTEMS, METHODS AND DEVICES FOR ANALYZING QUANTITATIVE INFORMATION OBTAINED FROM RADIOLOGICAL IMAGES	LELAND STANFORD JUNIO	low
23	SYSTEMS, METHODS AND DEVICES FOR ANALYZING QUANTITATIVE INFORMATION OBTAINED FROM RADIOLOGICAL IMAGES	LELAND STANFORD JUNIO	low
24	ANOMALY DETECTION IN VOLUMETRIC IMAGES	REALIZE	medium
25	SYSTEMS AND METHODS FOR INTEGRATING TOMOGRAPHIC IMAGE RECONSTRUCTION AND RADIOMICS USING NEURAL NETWORKS	RENSSELAER POLYTECHN	medium
26	CONTENT-BASED MEDICAL IMAGE RENDERING BASED ON MACHINE LEARNING	SIEMENS HEALTHCARE	low
27	CONTENT-BASED MEDICAL IMAGE RENDERING BASED ON MACHINE LEARNING	SIEMENS HEALTHCARE	low
28	IMAGE-BASED TUMOR PHENOTYPING WITH MACHINE LEARNING FROM SYNTHETIC DATA	SIEMENS HEALTHCARE	medium
29	METHOD AND SYSTEM FOR EVALUATING MEDICAL EXAMINATION RESULTS OF A PATIENT, COMPUTER PROGRAM AND ELECTRONICALLY READABLE STORAGE MEDIUM	SIEMENS HEALTHCARE	low
30	Image-based tumor phenotyping with machine learning from synthetic data	SIEMENS HEALTHCARE G	high
31	AUTOMATED LESION DETECTION, SEGMENTATION, AND LONGITUDINAL IDENTIFICATION	TAERUM, TORIN, ARNI - J	high
32	DETERMINING BIOMARKERS FROM HISTOPATHOLOGY SLIDE IMAGES	TEMPUS LABS, INC.	low
33	SYSTEM METHOD AND COMPUTER-ACCESSIBLE MEDIUM FOR DETERMINING BREAST CANCER RESPONSE USING A CONVOLUTIONAL NEURAL NETWORK	THE TRUSTEES OF COLUN	medium
34	JOINT ANALYSIS OF MULTIPLE HIGH-DIMENSIONAL DATA USING SPARSE MATRIX APPROXIMATIONS OF RANK-1	UNIVERSITY OF HAWAII -	medium

Table 6. Further ranking of the selected patents by ONCOVALUE partners.

#### 3.4 Key players identification

The most relevant organisations emerged from the analysis of funded projects and patents were grouped in the *Stakeholder list* and positioned in the *VIP Quadrant*. The 4 criteria applied for their selection are as follows and the stakeholders emerged from the analysis are **research and clinical (cancer) hospitals, HTA organizations, companies**.

Criterium	Stakeholders list
Strategic Stakeholder Selection Based on Patent Proximity: Stakeholders are selected from a list of patent applicants where the technology protected in the patents exhibits medium to high proximity to the technology developed in ONCOVALUE. This ensures stakeholders bring relevant intellectual property insights that align with the project's technological trajectory.	Arterys, Case Western Reserve University, Columbia University, D R Systems, IBM, Realize, Rensselaer Polytechnic Institute, Siemens Healthcare Gmbh, SNR Analytics, and the University of Hawaii.
CentralNodePositioningforEnhancedCollaboration:Stakeholders are identified for holding central nodeswithin the network map, highlighting their significantinfluence in fostering collaborative efforts. Theircentral positioning underscores their ability to drivesynergies and coordinate resources across thenetwork effectively.	Barcelona Supercomputing Center, CERTH, Erasmus MC, European Cancer Patient Coalition, Fundacio Clinic Per A La Recerca Biomedica, Karolinska Institutet, Oslo Universitetssykehus HF, and Universiteit Maastricht.
<b>Engagement-Driven Stakeholder Inclusion:</b> The selection process prioritises organisations that have actively participated in > 3 funded projects. This engagement indicates a commitment to advancing research and development, contributing to the collective progress of initiatives.	Erasmus MC, the European Cancer Patient Coalition, and Karolinska Institutet.
<b>Technological and Use Case Alignment with</b> <b>ONCOVALUE:</b> Stakeholders are also sourced from participants involved in projects that closely parallel ONCOVALUE's technological framework and practical applications: the INCISIVE project. This ensures familiarity with the technological landscape and proficiency in handling use cases pertinent to the project's objectives for future networking purposes.	Adapt It AE, Aristotelio Panepistimio Thessalonikis, Barcelona Supercomputing Center, Centro Regionale Information e Communication Technology Scarl, Certh, Elliniki Antikarniki Etaireia, Ethniko Kai Kapodistriako Panepistimio Athinon, European Dynamics Luxembourg SA, Fundacio Clinic Per A La Recerca Biomedica, Fundacio Ticsalut, Helsingin Yliopisto, ICCS, Incelligent, Kingston University, Linac-Pet Scan Opco Limited, Maggioli SPA, Visaris, Medtronic Iberica SA, Pagkyprios Syndesmos Karkinopathon Kai Filon 1986, Squaredev, Technologiko Panepistimio Kyprou, Thridium Limited, Time.Lex, Universita Degli Studi Di Napoli Federico II, Universita Degli Studi Di Roma Tor Vergata, Univerzitet U Novom Sadu, and White Research SRL.

Table 7. Stakeholders list.



#### The VIP Quadrant - "Vision and Innovation Potential Quadrant ©" enables to:

- Define the general framework of noticeable organizations working on a particular technology topic.
- Evidence those key smaller/emerging players with a very specific knowledge of the analysis subject matter.

This quadrant-based grouping allows for a structured analysis of stakeholder roles and their potential impact on the project's trajectory.

The analysis is intended to be qualitative but based on quantitative weighted measurement of a mixed scoreboard (Figure 12). More in detail,

- **Innovation Vision and Specific Knowledge** (x-axis) This considers both the R&D capacity in the field (including funding and IP) and a specific Affinity Index, which weights the proximity to the specific project technology at the centre of the analysis (NOTE that in this case the Affinity was also defined by considering TRL).
- **Investing Capacity** (y-axis) This considers the capacity and structure to invest (e.g., turnover), including the nature of the organisation.

The analysis categorises stakeholders into four distinct quadrants, each representing a unique role within the ecosystem:

- **Buyer** This quadrant encompasses stakeholders who primarily engage as purchasers within the market. They are characterised by their transactional relationships and their influence on demand for the technology. Several known companies (*IBM, Maggioli SPA*) are populating this quadrant, which creates possibilities of movements in market trends and technology adoption rates. These big players are followed by universities with venture capital support (*Universiteit Maastricht, Helsingin Yliopisto*), potentially leading to commercialisation partnerships or spin-off ventures.
- **Follower** Stakeholders in this quadrant are typically characterised by their observational role. They may adopt technologies based on prevailing trends and are influenced by the actions of other market players. Most of the stakeholders are placed in this quadrant, showing the need for technological disruption and boosting for the adoption of said technology in the market. Strategies could be implemented to transition these stakeholders from followers to early adopters or even innovators, thereby accelerating market evolution.
- **Incumbent** These stakeholders are established entities within the industry, often holding significant market share or influence. Their actions can set industry standards, and they are vested in maintaining the status quo. Within this quadrant, *Siemens Healthcare GMBH* stands out as the exclusive proprietor, indicating its dominant position and the substantial role it plays in shaping industry standards. This prominence underscores the company's capacity to influence technological trends and maintain a steady course in the market landscape.
- **Tech Provider** The final quadrant is reserved for stakeholders who supply the technological solutions. They are innovators and drivers of technological advancement, providing the necessary tools and services that fuel the development of projects. The current analysis reveals an absence of stakeholders within this





quadrant, which contrasts sharply with the populated Follower quadrant. This disparity suggests a potential gap in the market for technology providers, indicating an opportunity for new entrants or existing companies to establish themselves as key innovators and fill this void. It also reflects a possible need for initiatives that encourage the emergence of tech providers to balance the ecosystem and drive technological growth.





Figure 12. VIP Quandrant.

### 4. ONCOVALUE Exploitation

#### 4.1 The exploitation strategy

The exploitation strategy was preliminary prepared in the ONCOVALUE proposal with the goal of raising the consortium's awareness for the exploitability of the tangible and intangible results, to provide a basis for internal discussions and to increase the chances of the exploitation of the project KERs after the project's end. The consortium gives significant importance to the exploitation activities, both individually and by the consortium in a joint action. The exploitation planning activities started with Task 7.2 "Stakeholder scoping and mapping" and will continue throughout the project lifecycle with Task 7.7 "Technology trend and market watch" to link the technology trends to the market and Task 7.8 "Development of a sustainable business model" to analyze, define and fine-tune a long-term successful exploitation.

Regarding the individual exploitation plan, in the current stage, tangible and intangible assets were listed with a brief asset and access right description in section **Virhe**. **Viitteen lähdettä ei löytynyt**., then during the next months, information about partners involved, market sectors, end users and envisaged form of exploitation will be gathered. Nevertheless, the long-term objective is that every partner should enrich the description already reported in this deliverable with more details about functionalities, value proposition, commercial feasibility of each asset, planned actions and time frame, expected benefits and opportunities each partner is expected from the use and integration of the ONCOVALUE results.

The joint exploitation strategy will have to consider the several heterogeneous entities which compose the consortium: experts from within AI technology (particularly in deep learning and machine learning), e-health, clinical medicine sociology, psychology, ICT, education, communication and dissemination, innovation management. In fact, according to the heterogeneity of the project partners, exploitation strategy could include, for instance, activities like:

- Further analysis of the KERs
- Publication of articles, case studies in scientific\industrial journals and magazines
- Commercial exploitation of the ONCOVALUE solution (total or partial)
- Exploitation of the experience gained with the support about market demands, dissemination activities, technology trends.

The exploitation strategy is relying on the following milestones:

- *Intellectual Property Rights* will address ownership of the project results (foreground knowledge); licensing of pre-existing know-how (background knowledge); transfer of the knowledge gained within the project; confidentiality of project results and dissemination strategy.
- *Background knowledge:* the partners will update their background knowledge that they will put at disposal within the project, whenever needed during the project implementation.

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- *Initially map and describe the project tangible and intangible results* for each partner and their access right during and after the project duration.
- *Selection and characterization* of the KERs and related *Map of Risks*, performed with respect to sales opportunities, customer availability, attraction, technology, legal aspect, IPR and partnership (in Tasks 7.7 and 7.8).
- *Realisation of a Business Plan* (in Task 7.8) aimed at exploring the marketability of the proposed solutions and drafting the main strategies for future deployment and commercialisation. The business plan will include a market survey as well as an evaluation of the market size and competing technologies on the identified market(s). To this end, an Exploitation Roadmap will be developed, analysing potentially attractive applications for the ONCOVALUE solution. Value Proposition Canvas and the Lean Canvas will be prepared for the overall solution and for partners own KER. The business plan will also incorporate the evaluation of the Costs and Financials, definition of the business models and value proposition, production plan and a SWOT analysis.
- 4.2 The KERs

ONCOVALUE is generating several outcomes that can be promoted and test-marketed during the project and will be exploited by the consortium and/or partners at the end of the project. These outcomes consist of both **tangible and intangible results**, such as demonstrated training and learning methodologies and approaches. Some of the results will have potential for joint exploitation, while for others the partners of the consortium will maintain the option for pursuing individual exploitation, according to their IPR.

At this stage, the consortium foresees the development of results that could be exploited as a whole or individually. In addition, other results related to technologies, new products etc. may arise during the project's execution. Furthermore, the partners aim to identify (for some of them) other sectors of application in which they may be transferred, thus expanding the market; the approach could be to find connections between these results and market demand or what is receiving interest in other R&I initiatives at the European level.

The expected **intangible results** or **know how** will allow the consortium partners to develop a business of service provisions or strengthening their position in their research field or providing new trainings:

- Networking with Stakeholders: commercial partners (SHS, IQV, BCP, CTECH, TTOP, ELH) will continue to nurture their client base by providing their products and consultancy services, i.e., spanning from ICT-related solutions to healthcare as well as innovation consultancy. Clinical and research partners (HUS, NKI, RHP, IPOP, IRST, RIJN) will exploit the collaborations to generate new research ideas, joint projects and academic initiatives.
- **Scientific knowledge transfer and know-how**: clinical and research partners will strengthen their position within the key research areas of RWD, RWE versus cancers. New knowledge is disseminated to the research community by scientific publications and presentations at conferences.

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• **Training**: ELH will use the knowledge and developed training as part of their educational courses.

In M10 (September 2023), CTECH circulated among partners a preliminary list of results. During the project meeting in Milano in M12 (November 2023), CTECH held the (off and online) workshop #2 "*The Key Exploitable Results*": after the presentation, all partners had the opportunity to exercise and brainstorm on the selection of the KERs. A **KER** is an identified main interesting result which has been selected and prioritized due to its **high potential to be "exploited"** – meaning to <u>make use and derive benefits</u> - downstream the value chain of a product, process or solution, or act as an important input to policy, further research or education.

The table (Table 8) was then improved and finalised during the exploitation monthly meetings of M14, M15, M16, M17 (December 2023, January-March 2024), using the following criteria:

- degree of innovation
- exploitability
- impact.

At M18 the exploitation owners of the overall ONCOVALUE solution were not yet identified.

The access right to the KERs during project implementation was confirmed as agreed in the CA, while its preliminary definition for exploitation purposes was proposed by partners (Table 9). Of course, this will be updated along the project implementation in line with technical and clinical achievements.

#### DELIVERABLE 7.3, WP7 v1.3



KER #	Description	KER Type	WP/Task and WP/Task leader	Partner that contributes to the KER development (x); partner that benefits or use from the KER (/); partner with background (B)									
				HUS	N K I	E L H	IQV	R H P	BCP	SHS	IPO P	I R S T	CTEC H /TT OP
1	Guidelines and Standard Operating Procedures (SOPs)	new standard	T1.5, HUS	x, /	/		X	x , /			/	x , /	
2	AI algorithm for quantification of disease progression in terms of RECIST from longitudinal CTs + AI- tools for images. TOOL that can run on site or clinics can send data and the tool is run in SHS.	Product	T3.3, SHS	x, B: desktop application to annotate and segment medical CT or MR images for building training datasets for neural networks and other ML development.	x			X	x, /	x, /, B: SHS will use pre- existing software parts (in object code or source code form) to build training and processing pipelines for the registration of CT images and for the detection, segmentation, and characterization of lesions in CT images.			
3	Multilinguistic AI pipeline which derives structured medical variables from clinical notes (EHR) based on annotation. (Text analytics algorithm) API+ algorithm in a product	Product	T3.4, IQV	X	x		x, /, B: Extract, Transform, Load process, including AI pipeline. Clinical Data Collector CTcue application. Clinical Data Warehouse			g			
4	RWD-based HTA framework/methodol ogy (publications / training)	Product	WP2, NKI	/	x			1			/	/	
5	Technical approach for image analysis (AI algorithm - related to KER #2)	patent	WP3, SHS							x			
6	Validation process handbook	Product	WP4, IPOP	/	/		/	/	/	/	x, /	x , /	





7	Advanced combinatory analytic algorithms	Product	WP4, HUS	x,/	/	/	/	/	/		/	/	
8	Trainings	new service	WP6, ELH	/	/	x		/			/	/	
9	Technology Market Outlook report	Product	WP7, CTECH			/	/		/	/			x, /
10	federated model architecture + dashboard (or better visualisation)	Product	BCP	x (federated model queries),/	/			/	x, B: BC RQUEST software. BC LINK software. BC INSIGHT software. BC INSIGHT	x (Dashboard from AI algorithm)	/	/	
11	overall ONCOVALUE solution	policy tool	WP1- WP5, clinical partners.	x, /	x , /		X	x , /	X	X	x, /	x , /	
12	data quality report for HTA with procedures for data collection, description of tech solutions for quality control	Product	WP5	X	/		/	/	/		/	/	
13	report on the assessment of the legal requirements for federated model and use of clinical data (recommendations)	new standard	WP5	X									

Table 8. ONCOVALUE Key Exploitable results at M18. Red text indicates the KER main owner.

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KER #	Description	Acces	ss Rights
		Implementation	Exploitation
1	Guidelines and Standard Operating Procedures (SOPs)	Deliverable report will be available and exploitable for all ONCOVALUE partners when completed in May 2024.	It would possible to use the SOPs as a new reference for update/review/substitution of procedures already in place by other cancer centers (1st target) and regulators (2nd target). Open document under common creative approach.
2	AI algorithm for quantification of disease progression in terms of RECIST from longitudinal CTs + AI-tools for images. TOOL that can run on site or clinics can send data and the tool is run in SHS.	per-timepoint analysis + longitudinal analysis. Data transfer agreement is needed. HUS owns rights for this application and it will stay in HUS ownership during and after the project (from the CA).	in the future SHS will support automation to radiologist workflow, with AI. Applicable to both retrospective and prospective data. SHS provides technology + related software. Beyond ONCOVALUE project, the application will be available for hundreds of research projects and will thus facilitate the AI development and research activities of HUS Helsinki University Hospital (from the CA).
3	Multilinguistic AI pipeline which derives structured medical variables from clinical notes (EHR) based on annotation. (Text analytics algorithm) API+ algorithm in a product	annotation part: under development and agreement with partners. D3.4 is under development	to be defined
4	RWD-based HTA framework/methodology (publications / training)	n/a	other cancer centers can benefit from the result (1st target users). Publication in open access.
5	Technical approach for image analysis (AI algorithm - related to KER #2)	n/a	part of KER2 exploitation
6	Validation process handbook	It will be used by clinical and technical partners	clinical partners can continue to use the handbook to validate the process. New involved clinical partners will use the handbook to validate the process.
7	Advanced combinatory analytic algorithms	Implemented by HUS. The current plan is to use opensource software (R or Python) for dashboard/analytical method development. Overlaps with WP1 work. Clinicians (primarily from HUS) help in planning the analytics/dashboard. Other clinical partners can give feedback during the development process.	The current plan is to use opensource software (R or Python) for dashboard/analytical method development, thus all the clinical partners can exploit the results. The planning might overlap with BCP's federated dashboard planning.
8	Trainings	The ONCOVALUE Knowledge Hub will provide a curriculum of trainings which will be made	accreditation of training has to be evaluated. ELH will continue to provide trainings





		available publicly (HTML5 /SCORM) and partially in a learning management system. The chosen system is based on A New Spring technology but will be developed system independently (SCORM). Ambassadors engaged during the project will share the ONCOVALUE value proposition and promote the ONCOVALUE solution.	
9	Technology Market Outlook report	open access publication	open access publication, as milestone in the sector. Return in brand visibility in the sector.
10	federated model architecture + dashboard (or better visualisation)	implemented by BCP and used by clinical partners. Technical data agreement with the clinical partners to collect data.	agreement about the privacy of data (negotiations with HUS still ongoing). Collection of data and sharing of data are 2 different steps. Involvement of a legal advisors are needed to agree on how to collect + share data in the future. Video for hospitals targeted to patients to clarify the data flow and the protection of data. Potentially upgraded with HTA data in addition to clinical data. Exploitation route (BCP + IQVIA): licence + maintenance of the tools.
11	overall ONCOVALUE solution	a video will support the awareness raising towards patients, health authorities, highlighting the social benefits. The ethical board will support this potential exploitation route. The ONCOVALUE project will not have an impact on the patients whose data will be used during the project, but it will impact future patients if the project succeeds as planned	clinical partners, HTA bodies and regional / national health authorities (depending on the EU country) can negotiate the costs of oncology drugs based on the results of the tool
12	data quality report for HTA with procedures for data collection, description of tech solutions for quality control	It will be used by clinical and technical partners	to be defined
13	report on the assessment of the legal requirements for federated model and use of clinical data (recommendations)	n/a	to be defined

Table 9. Access rights to the KERs during and after the project.

### 5. Networking activities

*Task 7.5 "Networking activities"* identifies the projects and initiatives related to ONCOVALUE and pursues linking, exchange of best practice and synergy with them. Based on the work done under Task 7.2 "Stakeholder scoping and mapping" and to be done in Task 7.7 "Technology trend and market watch", connections will be sought with other research, development and innovation initiatives as well as potential users with interest in the KERs, with the aim to set the base for follow-up exploitation of the project outcomes.

Networking activities are important for:

- Increase the **impact** of ONCOVALUE with:
  - Synergies across projects to enable faster progress.
  - Maximise outcomes/impact of EU-funded research.
  - Knowledge sharing and exchange of best practice.
  - Wider communication and dissemination.
- Provide **feedback** to EU commission and policies with:
  - Health cluster research policy monitoring.
  - Input to support the future developments of the Health cluster work programme.
  - EC legislative work (e.g. EHDS regulatory proposal).

Apart from creating bilateral networking with other projects and initiatives, it's possible to build clusters of projects with common interests: in this case a cluster coordinating team is created with a representative of each project or two interchangeable coordinators from the partners and is responsible for the overall development and implementation of the clustering activities. If the cluster is sponsored by the European commission staff or the Project Officers or the DG, they will supervise the smooth running of the cluster, taking parts in the joint initiatives. The budget for clustering activities is taken from the dissemination budget of the individual projects.

In principle, clusters organise annual meetings, which may be held virtually or physically (depending on available budget), maybe linked to a project event, conference, ..., and working groups on practical topics of shared interest.

5.1 The MetReal cluster

The European Commission invited ONCOVALUE project to join the cluster on "**Methods to Use Real-world and Synthetic data for regulatory purposes and health technology assessment**" (**MetReal**).

The MetReal cluster is composed of the following projects presented in Table 10, plus ONCOVALUE.

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Project	Brief description
	The project focuses on the more effective and ethical use of registry data
	to support patient-centered decisions by drug regulators and HTA
EUROPA	agencies. The project is funded by the Horizon Europe framework
	programme, the main EU fund for research and innovation.
	Real4Reg is a consortium of ten European institutions which aims to
	promote the use of real-world data (national healthcare registers and
Real4Rea	claims data) to support the regulatory decisions about medicines.
	Real4Reg will take advantage of ground-breaking technologies such as
	artificial intelligence and machine learning. The structure and approach of
	our project aim to facilitate the implementation of the effective use of real-
	world data in regulatory decision-making and health technology
	assessment.
	REALM strives to drive forward innovative solutions that improve patient
	outcomes and empower healthcare practitioners to deliver the best
	possible care. The REALM consortium envisions a future where patients
	can benefit from cutting-edge medical software that is developed and
	evaluated with a focus on safety, efficacy, and usability, thanks to the joint
	efforts of our diverse stakeholders. REALM aims to develop a collaborative
	framework through which regulatory authorities, software developers,
	healthcare professionals and policy offers can jointly create and evaluate
	innovative medical device software – for the direct benefit of patients and
	healthcare practitioners.
	Randomised controlled trials (RCT) are the cornerstone of evidence-based
	medicine. However, the digitisation of real-world data (RWD) including
	data from devices, wearables, and electronic health records in large
	national registries provides opportunities to demonstrate efficacy and
	safety of innovative technologies including drugs, devices, diagnostics, and
	digital health. These data are particularly relevant to long-term conditions
	such as diabetes mellitus, where drugs, lifestyle interventions, and digital
	technologies often work together.

Table 10 Projects of the MetReal cluster.

In M4 (6 March 2023) the kick-off meeting of the MetReal cluster was held in Brussels, with ONCOVALUE actively participating. This meeting enabled:

- To provide an overview of EU research & innovation activities relevant to RWD and synthetic data.
- To kick-off the work of the cluster that aims at optimising synergies and increasing the impact of each individual project.
- To discuss and agree on the topics of common interest for collaboration, the so-called "joint activities".
- To agree on the best way forward, including the practical organisation and a possible timeline of the next cluster meetings.
- To exchange ideas on synergies between the projects and the ongoing and future EU initiatives relevant to RWD and synthetic data (regulatory or HTA initiatives, DARWIN, EHDS, personalised medicine etc.).

The projects addressed the following points:

- a) An overview of the project objectives.
- b) The planned methodological approach.
- c) The regulatory and/or HTA questions to be addressed in the project with the use of RWD and synthetic data.

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- d) The types of methods and evidentiary standards to be applied or developed in the project to address those needs.
- e) The stakeholders/end-users that would benefit from the methods to be developed in the projects.
- 5.2 The EASiNet cluster

IRST, partner of ONCOVALUE, invited ONCOVALUE project to join the cluster "**European AI Security Network**" (**EASiNet**), composed of the following projects.

Project	Brief description
HARPOCRATES	HARPOCRATES leverages novel cryptographic schemes to advance the capabilities of Privacy Preserving Machine Learning and Federated Learning, thus enabling decentralised training, validation, and prediction on encrypted data. Such privacy-preserving services and secure computation enable users to both benefit from cloud-based machine intelligence and maintain control over data. HARPOCRATES will enable digitally blind evaluation systems demonstrated in practical application scenarios, helping build fairer, democratic, and unbiased societies.
PAROMA-MED Privacy Aware and Privacy Preserving Distributed and Robust Machine Learning	PAROMA-MED project aims to develop novel technologies, tools, services and architectures for patients, health professionals, data scientists and health domain businesses so that they will be able to interact in the context of data and ML federations according to legal constraints and with complete respect to data owners' rights from privacy protection to fine grained governance, without performance and functionality penalties of ML/AI workflows and applications.
encrypt	ENCRYPT project's vision it to go beyond-the-state-of-the-art to overcome the limitations of these Privacy Preserving technologies in several aspects. First of all, it will address the scalability issue. Second, as a way to address the drawbacks of each technology in terms of covered threats and performance, ENCRYPT will investigate the combinations of several of these PP methods. Third, ENCRYPT will address the slow computation times associated with the existing solutions for privacy-preserving technologies based on HE or SMPC. Fourth, ENCRYPT will look at the necessary methods in order to make these advanced PP technologies easier to interact with existing infrastructures and more traditional security mechanisms.
	The WARIFA project will develop a prototype of a combined early risk assessment tool that will provide individual citizens with personalised recommendations for the management of chronic conditions - such as cancer, cardiovascular diseases, diabetes and chronic respiratory diseases – which represent the leading causes of death for the citizens of the European Union. WARIFA will be available to individual citizens via a user- friendly interface on their smartphone.
Al4 meosc	The vision of the AI4EOSC project is to increase the service offer in the EU landscape by expanding the European Open Science Cloud (EOSC) ecosystem to support the effective utilization of state-of-the-art AI
	techniques by the research community . In this regard, the project will provide highly innovative services built on top of existing EOSC services, thus allowing EU researchers to efficiently exploit large and distributed datasets, following a service-oriented approach over the EOSC continuum.
CERTIFY	CERTIFY defines a methodological, technological, and organizational approach towards IoT security lifecycle management

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Clinical Knowledge for Humanity	KATY will develop an AI-empowered personalised medicine system that will greatly assist medical professionals and researchers in their daily work. Bringing easy-to-understand AI data to their fingertips, this next- generation technology will bridge the gap between AI data and medical application. It will thus become a powerful tool in diagnosing, treating and defeating serious illnesses. As a stress test, the KATY project will initially experiment with data from patients with a rare and complex form of kidney cancer.
TITAN - Trusted	TITAN will enrich the EOSC Interoperability Framework with a software
envIronments for	platform solution for confidential data collaboration and secure and
confidenTiAl computiNg and	privacy-preserving data processing. The platform will enable access to
secure data sharing	sensitive data sets from public entities and government agencies and will
	be compatible by design with the EOSC IF on the technical, semantic,
	organisational and legal layers. To promote community adoption of
	demonstrated in several vertical cross-border scenarios - notably in the
	nublic administration and healthcare sector
	FLUTE is set to revolutionize healthcare data utilization through a privacy-
	preserving approach. Our project aims to improve predictions of
	aggressive prostate cancer through AI support to physician, while
	minimizing unnecessary biopsies, ultimately benefiting patients and
	reducing associated costs.

Table 11 Projects of the EASiNet cluster.

EASiNet brings together several European funded projects to collaborate on AI and cybersecurity in different fields. The aim is to raise awareness, exchange project results, promote open science and develop common strategies for project exploitation.

5.3 Other projects and initiatives

Within Task 7.5 CTECH and TTOP started to contact 6 funded projects emerged from the stakeholder analysis and established connections with their coordinators and D&C experts. In addition, ONCOVALUE has joined forces with the PHEMS project, where HUS is a partner, to hold a joint webinar about EHDS.

Project	Brief description	Joint initiatives
Improving       cancer         diagnosis       and         prediction       with AI and big data	INCISIVE is a 42-months research project, funded under the call DT-TDS-05-2020 – AI for Health Images. The INCISIVE project aims to develop and validate an AI- based toolbox that enhances the accuracy, specificity, sensitivity, interpretability and cost-effectiveness of existing cancer imaging methods.	<ul> <li>Introductory meeting between CTECH and the INCISIVE Coordinator and D&amp;C expert on M14 (January 2024).</li> <li>synergies about data sharing, for cancer AI modelling.</li> </ul>
EUCAN <u>Towards a</u> <u>European cancer</u> imaging platform <u>for enhanced</u> <u>Artificial</u> <u>Intelligence in</u> <u>oncology</u>	EuCanImage will build and demonstrate a GDPR- compliant and scalable platform for leveraging large- scale, high-quality and interoperable cancer imaging datasets adequately linked to biological and health cancer data. The platform will integrate advanced capabilities and new standards to develop and validate integrative decision support systems for precision oncology with increased clinical trust and adoption. The project consortium is an experienced and ambitious academic-industrial-clinical partnership, with a proven track record in data management, responsible data sharing, cancer imaging research, and AI for	<ul> <li>Introductory meeting between CTECH, the EUCAN IMAGE and RadioVal Coordinator and D&amp;C expert on M15 (February 2024).</li> <li>meeting under organization with both projects.</li> <li>synergies about:</li> <li>1. Extraction of structured data from</li> </ul>

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<b>Q</b> radioval <u>Empowering</u> <u>Personalised</u> <u>Treatment of Breast</u> <u>Cancer Patients</u>	RadioVal implements the first international, clinical validation study of radiomics-based prediction of neoadjuvant chemotherapy treatment response from breast MRI. The project will develop a comprehensive and standardised methodological framework for multi- faceted radiomics evaluation based on the FUTURE-AI Guidelines, to assess Fairness, Universality, Traceability, Usability, Robustness and Explainability. Furthermore, the project will introduce new tools to enable transparent and continuous evaluation and monitoring of the radiomics tools over time.	<ul> <li>clinical reports using AI and NLP.</li> <li>2. Collection and integration of data on quality of life and clinical outcomes.</li> <li>3. Methods for combining different types of data to assess AI-driven technologies.</li> </ul>
EUCAIM <u>Building a Data-</u> <u>Driven Future for</u> <u>Cancer Care</u>	The EUCAIM project was born out of a need to advance the field of cancer diagnostics and treatment through the use of AI and medical imaging data that is available but fragmented across Europe and the globe. To achieve this ambitious goal, the project brings together five previously funded projects of the Artificial Intelligence for Health Imaging (AI4HI) project cluster, each of which was focused on a specific aspect of AI and cancer images. By pooling their resources, expertise, research efforts and real-world achievements, and adding additional key players, the EUCAIM project is uniquely positioned to create and deploy a strong and unified research infrastructure that will accelerate the development and implementation of AI-driven cancer diagnosis and treatment solutions, ultimately improving patient outcomes across Europe. This project is focused on addressing the challenges	<ul> <li>Introductory meeting between CTECH and HUS and the EUCAIM Coordinator and D&amp;C expert in M16 (March 2024).</li> <li>EUCAIM provided information and benefits of becoming an EUCAIM stakeholder and receiving updated information about the open calls.</li> <li>synergies about data sharing, imaging for cancer AI modelling.</li> <li>joint webinar in M18</li> </ul>
Pediatric Hospitals as European drivers for multi-party computation and synthetic data generation capabilities across clinical specialities and data types	posed by privacy concerns and the complexity of data sharing due to varying interpretations of the EU General Data Protection Regulation (GDPR). By developing a decentralized and open health data ecosystem, PHEMS strives to facilitate easier access to health data, thereby advancing federated health data analysis and creating services for generating shareable synthetic datasets.	(May 2024) about: - secondary use of health data in the final version of EHDS, how will the implementation go forward. - Data quality, utility and maturity label
Tackling Cancer Through Real World Data and Artificial Intelligence	The aim is to harness the power of AI to advance treatments and facilitate decision-making for physicians and patients with prostate, breast and lung cancer. The project will use the platform to drive the generation of new knowledge by developing advanced analytics and AI models to identify, prioritise and fill the main knowledge gaps in prostate, breast and lung cancer, and propose improved clinical guideline recommendations. They will develop AI-based decision support tools that can help clinicians, together with their patients, make treatment decisions based on the leading clinical practice guidelines.	Outreach is pending
I <sup>3</sup> LUNGSolving the Puzzle ofLungCancerComplexitywithArtificialIntelligence	I3LUNG is a European project funded under the framework of the H2020 call "Ensuring access to innovative, sustainable and high-quality health care". Our consortium gathers 16 partners located worldwide characterized by different expertise, with the common goal of providing better assistance and individualize treatment for patients affected by metastatic lung cancer.	Outreach is pending

Table 12. Other projects and initiatives of interest for ONCOVALUE.

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### 6. Conclusions

This deliverable outlines three main activities conducted between M1-M18:

- The systematic stakeholders' analysis, through the analysis of patents and funded projects of interest for ONCOVALUE. The stakeholders emerged from the analysis belong to research and clinical (cancer) hospitals, HTA organizations, companies.
- <sup>(2)</sup> The development of the exploitation strategy for ONCOVALUE and the preliminary definition of the KERs.
- The participation of ONCOVALUE in two clusters and networking with other EU funded projects.

All activities aimed at identifying the most important stakeholders for ONCOVALUE innovations and assessing their position towards the project's value chain to set up more focused engagement strategies. Based on the results, more targeted dissemination and exploitation actions will be implemented.





### 7. References

Not applicable.



### 8. Annex

#### 8.1 The List of Projects

Acronym	Title
ONCOVALUE	Implementing value-based oncology care at European cancer hospitals: An AI-based framework for assessing real-life
	effectiveness of novel cancer therapies in real-time
INCISIVE	A multimodal AI-based toolbox and an interoperable health imaging repository for the empowerment of imaging
	analysis related to the diagnosis, prediction and follow-up of cancer
BIGMED	A mainframe solution for introducing precision medicine
Coremine Vitae	Coremine Vitae - to identify personalized treatment options for cancer patients
EuCanImage	A European Cancer Image Platform Linked to Biological and Health Data for Next-Generation Artificial Intelligence
	and Precision Medicine in Oncology
DATA-CAN	DATA-CAN - The Health Data Research Hub for Cancer
EHDEN	European Health Data and Evidence Network
OPTIMA	Optimal treatment for patients with solid tumours in Europe through Artificial intelligence
RESCUER	ERA-NET: Resistance under treatment in breast cancer (RESCUER)
RESCUER	RESISTANCE UNDER COMBINATORIAL TREATMENT IN ER+ AND ER- BREAST CANCER.
I3LUNG	Integrative science, Intelligent data platform for Individualized LUNG cancer care with Immunotherapy
IASIS	Integration and analysis of heterogeneous big data for precision medicine and suggested treatments for different types
	of patients
REALM	Real-world-data Enabled Assessment for heaLth regulatory decision-Making
CLARIFY	Cancer Long Survivors Artificial Intelligence Follow Up
REBECCA	REsearch on BrEast Cancer induced chronic conditions supported by Causal Analysis of multi-source data
IMAGING -	IMAGING
AIDENCE	
PICTURES	MICA: InterdisciPlInary Collaboration for efficienT and effective Use of clinical images in big data health care
	RESearch: PICTURES
(none)	Next Generation Explainable Medical Computer Vision
PIONEER	Prostate Cancer DIagnOsis and TreatmeNt Enhancement through the Power of Big Data in EuRope
ASCAPE	Artificial intelligence Supporting CAncer Patients across Europe

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Acronym	Title
Eurostars_2020_15	Platform for Image Analysis in Oncology
TumorScope	TumorScope: Leveraging VUB and UZ Brussels expertise towards a digital health research platform. (IRP20)
(none)	Decision support system for recommending EGFR-inhibiting drugs
(none)	DL: PROVIZ - Prostate cancer visualization by MRI - Improved diagnostics using artificial intelligence
PANCAIM	Pancreatic cancer AI for genomics and personalized Medicine
(none)	SBIR Phase I: Exploring bias in Deep learning to extend its use to under-represented populations in breast imaging
EOSC4Cancer	A European-wide foundation to accelerate Data-driven Cancer Research
REVERT	taRgeted thErapy for adVanced colorEctal canceR paTients
AIDAVA	AI powered Data Curation & Publishing Virtual Assistant
RWE	Real-World Evidence (RWE) supported drug R&D through drug signal detection and oncology external control arms
ACCELERATE	
PRIMAGE	PRedictive In-silico Multiscale Analytics to support cancer personalized diaGnosis and prognosis, Empowered by
	imaging biomarkers
Euradiomics	Imaging-based Big Data for decision support systems for cancer: productization and sustainable research and
	development of Radiomics products
RadioVal	International Clinical Validation of Radiomics Artificial Intelligence for Breast Cancer Treatment Planning
(none)	Development and implementation of cooperative cross-border procedures to ensure high treatment success for cancer
	patients (Entwicklung und Einführung von kooperativen grenzüberschreitenden Verfahren zur Sicherung hoher
	Behandlungserfolge bei Krebspatienten / Opracowanie i wprowadzenie transgranicznego trybu współpracy dla
	zapewnienia wysokiej wyleczalności chorób nowotworowych)
More-EUROPA	More Effectively Using Registries to suppOrt PAtient-centered Regulatory and HTA decision-making
(none)	Deep learning for health
(none)	Precision, pulmonary disease evaluation and lung cancer detection using quantitative low-dose CT
MATRIX	Multimodal Approach Targeting treatment Refractory cancers usIng neXt generation technologies and trials
DataTools4Heart	A European Health Data Toolbox for Enhancing Cardiology Data Interoperability, Reusability and Privacy
WIML	WIML: Workflow-integrated machine learning. An innovative solution for precision imaging in radiology
(none)	Improving breast cancer screening through dynamic big data analytics of Quantitative Imaging Biomarkers
(none)	SBIR Phase II: Determination of complex outcome measures using narrative clinical data to enable observational trials
(none)	Use of deep learning and Big Data in the Norwegian Breast Cancer Screening Program

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Acronym	Title
(none)	AlforScreening: Robust and trustworthy AI for breast cancer screening with mammography
(none)	AI for Health Imaging
AICCELERATE	AI Accelerator – A Smart Hospital Care Pathway Engine
(none)	Causal Modelling with Graph Neural Networks for Personalised Medicine in Computational Pathology
REDDIE	Real-world evidence for decisions in diabetes
BigData@Heart	Big Data 4 Better Hearts - Sofia ref.: 116074
(none)	Generating RWE by using the Norwegian Cancer Registry and the INSPIRE project as a source.
INTERVENE	International consortium for integrative genomics prediction
EuroPOND	Data-driven models for Progression Of Neurological Disease
eCREAM	enabling Clinical Research in Emergency and Acute care Medicine through automated data extraction
(none)	Image Analysis Tools for mpMRI Prostate Cancer Diagnosis Using PI-RADS (part 1)
(none)	Image Analysis Tools for mpMRI Prostate Cancer Diagnosis Using PI-RADS (part 2)
(none)	Image Analysis Tools for mpMRI Prostate Cancer Diagnosis Using PI-RADS (part 3)
Real4Reg	Development, optimisation and implementation of artificial intelligence methods for real world data analyses in
	regulatory decision-making and health technology assessment along the product lifecycle
IDEA4RC	Intelligent Ecosystem to improve the governance, the sharing and the re-use of health Data for Rare Cancers
WARIFA	Watching the risk factors: Artificial intelligence and the prevention of chronic conditions
(none)	Computer models for CRLM progression assessment based on histopathological image scans
EU-STANDS4PM	A European standardization framework for data integration and data-driven in silico models for personalized medicine
(none)	Brain Tumor Detection and Classification from a Single MRI Slice Using Convolutional Neural Networks
SECURED	Scaling Up secure Processing, Anonymization and generation of Health Data for EU cross border collaborative
	research and Innovation
(none)	The sublanguage factor: Modeling term variation in clinical records
AIT4CR	AI-Powered Testing Infrastructure for Cancer Registry System
PMOHR	Probabilistic modelling of electronic health records
<b>RES-Q PLUS/</b>	Comprehensive solutions of healthcare improvement based on the global Registry of Stroke Care Quality
RES-Q+ (1st part)	
<b>RES-Q PLUS/</b>	Comprehensive solutions of healthcare improvement based on the global Registry of Stroke Care Quality
RES-Q+ $(2^{nd} part)$	

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Acronym	Title
EUCAIM	European Federation for Cancer Images
GDI	Genomic Data Infrastructure
EDITH	An ecosystem for digital twins in healthcare
TEF-Health	Testing and Experimentation Facility for Health AI and Robotics
FLUTE	Pioneering secure healthcare AI across borders
ENCRYPT	A Scalable and Practical Privacy-Preserving Framework
AI4EOSC	Artificial Intelligence for the European Open Science Cloud
Harpocrates	Federated Data Sharing and Analysis for Social Utility