AIDEAS

D8.1 – Key Exploitable Results, IPR & Business Model Canvas

WP8 – IMPACT:
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ABSTRACT	This deliverable presents the comprehensive AIDEAS exploitation methodology, aimed at expediting technology adoption and advancing the developed results toward market readiness. The methodology encompasses a structured sequence of initiatives tailored to collaboratively involve consortium partners in the formulation and establishment of an actionable and sound go-to-market strategy.
	Additionally, it aims to increase awareness regarding the value of the generated Intellectual Property (IP) assets as well as securing them. This is executed through a continuous IP monitoring process. It first establishes the legal framework in relation to the marketability of AIDEAS solutions, and secondly, delves into the Freedom to Operate (FTO) analysis process, through four steps: analysis of the solutions, indicative search for patents, analysis of the results of this search, and setting up exploitation paths that minimise the risks of conflicts identified from the FTO analysis.
	In this first reporting period, partners revisited their initial business assumptions, the interrelationships between all results, partners, and demonstrating pilots, as well as understanding the different steps in the exploitation path, including continuous IP monitoring. They are now able to continue the preparatory work (exercises on defining the Value Proposition and Buyer Personas) to be ready to reach out to the market and potential early adopters through the Expression of Interest (EoI) call.

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

ABBREVIATIONS/ACRONYMS

ADR Alternative Dispute Resolution

AI Artificial Intelligence

BMC Business Model Canvas

DoA Description of Actions

EC European Commission

EoI Expression of Interest

EPC European Patent Convention

EPO European Patent Office

EU European Union

EUIPO European Union Intellectual Property Office

FTO Freedom-to-Operate

IP Intellectual property

IPC International Patent Classification

IPR Intellectual property Rights

KER Key Exploitable Result

NDA Non-Disclosure Agreement

OER Other Exploitable Result

PLC Programmable Logic Controller

RAM Random Access Memory

TLD Top-Level Domain

TRL Technology Readiness Level

USPTO United States Patent and Trademark Office

WIPO World Intellectual Property Office

Executive summary

The main purpose of the AIDEAS exploitation methodology is to facilitate the technology uptake and drive the AIDEAS results towards market readiness. This is done through a series of actions designed to engage the consortium partners in defining and refining their exploitation strategy, raise awareness of the potential of their generated intellectual property assets, as well as the engagement of potential early adopters of the AIDEAS exploitable results via the Expression of Interest (EoI) call.

This deliverable outlines the planned course of action for tasks 8.4 - Exploitation and Market Readiness, and 8.5 - IPR Monitoring and Assessment, which are a direct part of the comprehensive exploitation methodology devised. This document also provides an overview of the work carried out in the first 12 months of the project within these tasks.

As a first step in this overall process, all partners designated their respective Exploitation Managers, to ensure smooth communications with respect to exploitation matters. The second step involves sending an Exploitation Survey to all partners to prepare them for the first workshop of the exploitation methodology. This was the Key Exploitable Results (KER) Mapping workshop, which was held in February 2023. Its purpose was to revise the potential results of the project, prioritise them, clarify their interrelations, and map their exploitation-related needs. The workshop consisted of 3 parts: AIDEAS partner positioning in the exploitation landscape, KERs interrelations, and lastly, a ranking canvas. The latter provided an overview of the currently estimated market readiness and potential of each individual AIDEAS result.

As an outcome of the workshop, it was clear that all AIDEAS partners should aim to be ready with the value proposition of their individual solutions before the Expression of Interest (EoI) call is launched, since that way, they will maximise the opportunities of gathering feedback from potential early adopters and increase their market readiness. The details of such Workshop and its outcomes are highlighted in Section 4 of this deliverable.

From an Intellectual Property Rights (IPR) monitoring and control perspective, the first objective of this deliverable is to define the European Union (EU) regulatory framework for stakeholders' activities in relation to the marketability of the solutions advocated by the AIDEAS project.

The second objective consists of posing a Freedom to Operate (FTO) analysis for the evaluation of the potential conflict risks coming from the existing patents that could present similarities with the AIDEAS solutions. The FTO analysis, from a technical point of view, will be developed mainly in four stages or steps throughout the project development period: Initially, the solutions proposed by AIDEAS will be analysed from both a technical and business perspective. The second step will consist of a search to obtain, for each of the AIDEAS KERs (AIDEAS suites), a list of similar and/or competing products or technologies.

The third step involves the analysis of the documents on these products and technologies and the relevant literature with the aim of projecting how these hypothetical conflicts could affect the plans of the AIDEAS solution providers in their exploitation.

Finally, the fourth step consists of making decisions on exploitation paths that minimise the conflict risks identified from the FTO analysis. From the perspective of the AIDEAS project development and timing, this activity will be carried out in different phases: Up to M12, a first phase will consist of gathering preliminary details on the technical and business aspects of the different solutions and establishing the legal framework for implementation, while providing some initial screening results. This preliminary information will be iterated and updated in the second phase, in M24 to carry out the FTO analysis, together with an IPR evaluation analysis and the design and implementation of the initial IPR protection strategy.

Then, after the work described in this deliverable is completed, the overall exploitation process will continue through a series of activities: first, the partners will complete the survey regarding the Competitors Mapping and the Elevator Pitch, which will help in positioning AIDEAS results with respect to the market, as well as preparing them for the second workshop of the series of the exploitation workshops, the Value Proposition Workshop. Next, the process will continue with the Buyer Persona Workshop. After that, the consortium should be ready to launch the EoI, and gather valuable feedback from potential customers. This work will be reflected in the upcoming reporting period, in M24.

Finally, in the last phase of the exploitation process, the Business Model Canvas of the AIDEAS exploitable results will be refined, and, together with the supporting IPR monitoring process, it will be all consolidated before the end of the project in M36, gathering the most comprehensive exploitation plan possible.

Document structure

Section 1: Introduction: Brief introduction to the deliverable, objectives, and exploitation methodology followed.

Section 2: Exploitation Survey: Review of the first exploitation action by the consortium.

Section 3: Key Concepts in the Exploitation Methodology: Brief description of the overall key aspects of the followed methodology.

Section 4: Mapping of AIDEAS' Key Exploitable Results: Detailed view on the results of the 1st Exploitation Workshop held.

Section 5: Intellectual Property Rights: General overview of the EU regulatory framework and explanation of first stages of the FTO analysis.

Section 6: Next Steps in the Exploitation Activities: Revisit of the preliminary drafted Business Model, and overview of the upcoming steps to reach to a validated Business Model backed by both the perspective from the consortium partners (i.e., the offering party) and the potential early adopters (i.e., the customers).

Section 7: Conclusions and Final Considerations: Concluding the deliverable by summarising the main remarks and commenting on the way forward for the next iterations in M24 and M36.

1. Introduction

The AIDEAS Project develops AI technologies for supporting the entire life cycle of industrial equipment (design, manufacturing, use and repair/reuse/recycle) as a strategic instrument to improve the sustainability, agility, and resilience of the European machinery manufacturing companies. In order to support the industrial fabric formed by these companies, the AIDEAS project aims to offer a comprehensive set of 5 Key Exploitable Results (4 suites + the Machine Passport), composed of a total of 15 solutions (i.e., the Other Exploitable Results), covering the entire life cycle (4 stages) of industrial equipment (see **Error! Reference source not found.** below). The AIDEAS solutions are considered software products that can be purchased individually, solution by solution, or together in the form of suites.

AIDEAS Industrial Equipment Design Suite	AIDEAS Industrial Equipment Manufacturing Suite	AIDEAS Industrial Equipment Use Suite	AIDEAS Industrial Equipment Repair-Reuse-Recycle Suite
AIDEAS Machine Design Optimiser	AIDEAS Procurement Optimiser	AIDEAS Machine Calibrator	AIDEAS Prescriptive Maintenance
AIDEAS Machine Synthetic Data Generator	AIDEAS Fabrication Optimiser	AIDEAS Condition Evaluator	AIDEAS Smart Retrofitter
		AIDEAS Anomaly Detector	AIDEAS LCC/LCA/S-LCA
AIDEAS CAx Addon	AIDEAS Delivery Optimiser	AIDEAS Adaptive Controller	
		AIDEAS Quality Assurance	AIDEAS Disassembler
AIDEAS Machine Passport			

Figure 1. AIDEAS Solutions (OERs) and Suites (KERs)

To facilitate the technology uptake and successfully drive the AIDEAS results towards market readiness, the following comprehensive exploitation methodology is executed (see Figure 2 below).
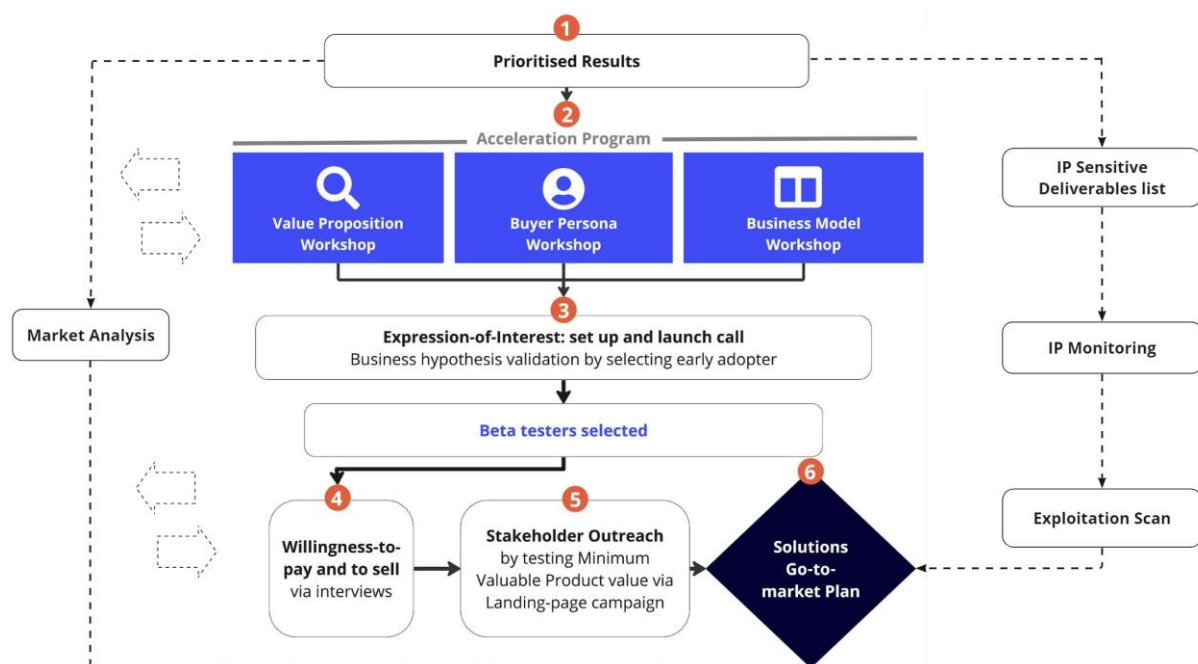
Figure 2. AIDEAS comprehensive exploitation methodology

As an introductory step to initiating the process, the partners complete a preliminary **Exploitation Survey**, to understand the commercial and non-commercial goals of all actors involved. Next, the list of exploitable results of the AIDEAS project is revisited and thoroughly analysed (**KER Mapping Workshop**) to understand the different levels of readiness of each result, the interrelationships between partners, results and the pilots, as well as the specific needs they may have. Subsequently, the partners undergo an acceleration program consisting of three steps: definition of the **Value Proposition** of each result, analysis of the **Buyer Persona**, and drafting of the **Business Model**. This will then lead to the phase of outreach to the potential early adopters from the market, through the **Expression of Interest (EoI)** campaign.

Upon **selecting** the list of potential **beta testers**, a series of business hypotheses, such as the *willingness to pay* will be validated via interviews. Lastly, a broader outreach will aim at gathering feedback on the **Minimum Viable Product** through rapid testing, such as landing pages.

In parallel, two other processes take place. First, a crucial and continuously ongoing **IP Monitoring process** makes sure the exploitable results and the generated IP assets remain secure throughout the project. This, together with a supporting **Market Analysis** effort that enables filling the potential gaps partners may identify during the course of the project, impacts the findings and outcomes at any of the exploitation stages, thereby acting as a loop that can be iterated and refined as deemed necessary.

As the ultimate goal, all of the previously explained steps of the methodology culminate into a comprehensive and actionable **Go-to-Market or Exploitation Plan**.

In this deliverable, we will review all the activities related to the exploitation and IPR monitoring carried out during the first 12 months of the project. According to Figure 2, only step 1 (prioritised results) has been covered in this first period. The activities will continue with step 2, (the acceleration program) in the next period.

2. Key concepts in the Exploitation Methodology

In the AIDEAS exploitation methodology, the following terms of reference will be used:

- **Key exploitable results (KERs):** core results identified in the AIDEAS Description of Action (DoA) covering the 5 main AIDEAS results: Industrial Equipment Design Suite, Industrial Equipment Manufacturing Suite, Industrial Equipment Use Suite, Industrial Equipment Repair-Reuse-Recycle Suite, Machine Passport (see **Error! Reference source not found.**).
- **Other exploitable results (OERs):** standalone solutions that, grouped in Suites, form each of the 5 KERs of the project (AIDEAS Suites + Machine Passport). We can see the detailed description of each OER in the following table:

AIDEAS Solutions	Code	Description
AIDEAS Machine Design Optimiser	AI^{MDO}	Toolkit to assist designers to optimally define the key design parameters in multiphysical systems, enhancing machine performance as required for each scenario, through AI.
AIDEAS Machine Synthetic Data Generator	AI^{MDG}	Toolkit for synthesising large high-quality datasets by simulations for the analysis of the machine design and for the training of the optimisation algorithms that will propose optimal design parameters.
AIDEAS CAx Addon	AI^{CAx}	Set of APIs and UIs supporting the integration of AI-assisted optimisation modules into CAx systems.
AIDEAS Procurement Optimiser	AI^{PO}	Toolkit for optimising the inventory and purchase of materials and components that are required to build a machine, and meet customer delivery dates using AI.
AIDEAS Fabrication Optimiser	AI^{FO}	Toolkit for optimising production scheduling and resource allocation by predicting production and set-up times, operations dependencies, etc. allowing a near real time response to environment changes like machine breakdowns, last minute customer orders and raw materials delays, through AI.
AIDEAS Delivery Optimiser	AI^{DO}	AI-based toolkit that is capable of optimising the storage and delivery of products. This optimisation will target storage space, storage conditions and product transportation. Additionally, this optimiser will provide optimisation for logistics scheduling and planning
AIDEAS Machine Calibrator	AI^{MC}	Toolkit for the fast calibration of industrial equipment when installed for the first time in a factory or when a re-calibration is needed. It uses AI techniques for providing the most well-suited calibration parameters.
AIDEAS Condition Evaluator	AI^{CE}	Toolkit for determining the condition of the machine as a whole or of some of its components when it is in working conditions in the factory where it is being used.
AIDEAS Anomaly Detector	AI^{AD}	Toolkit that will allow detecting anomalies at component-level or of the machine as a whole when it is in working conditions in the factory where it is being used.
AIDEAS Adaptive Controller	AI^{AC}	Toolkit to train models with measurement data and then train machine controllers with said models to accommodate the machine condition and requirements.
AIDEAS Quality Assurance	AI^{QA}	Toolkit comprising a set of AI-enabled features for manufactured product quality monitoring.
AIDEAS Prescriptive Maintenance	AI^{PM}	Toolkit for predicting remaining useful life and identifying maintenance requirements with the target of extending the overall machine remaining life.
AIDEAS Smart Retrofitter	AI^{SR}	Toolkit for smart retrofitting old machine tools to give them a second life by improving working conditions and product quality, developing a communication system and collaboration, enhancing productivity, efficiency, flexibility, and agility.
AIDEAS LCC/LCA/S-LCA	AI^{LC}	Toolkit that combines AI and Life Cycle methodologies (LCC, LCA, S-LCA) for identifying the best machine end-of-life by devising a multi-objective optimisation strategy to strike a balance between economic, social and environmental benefits.
AIDEAS Disassembler	AI^{DIS}	AI based toolkit for modelling the disassembly/recycle processes to help streamline the infrastructure needed to circulate materials focusing around the ability for AI algorithms to recognise and identify objects using cameras and other sensors.

Figure 3. AIDEAS Other Exploitable Results (OERs)

- **Additional results:** any new knowledge that partners will use after or outside the project within their organisation or beyond and is not directly one of the predefined OERs. Some examples of additional results could be the following:
    - Potential new product or device based on partner's work on the project.
    - Improvement to an existing product.
    - Design improvement that will be used in other works, products or projects.
    - New process or process improvement.
    - Advance in scientific understanding which could lead to new research.
    - Lessons learnt.
    - New generic approaches.
    - New standards.

- **Expression of Interest (EoI)**: An Expression of Interest is a straightforward online form where the user (a potential early adopter of the results of the project, external to the consortium, as opposed to the pilots) has the possibility to apply for testing new innovative technologies for free. It's an opportunity to meet with experts and access new solutions that could improve their company's processes. From the point of view of the partners (owners of the results), it is a streamlined way of connecting with potential end-users to verify the assumptions of their business case as early as possible, maximising the chances of success when entering the market.

3. Exploitation Survey

An **exploitation survey**, composed of questions related to the exploitation of the KERs, OERs and additional results (see Appendix I for further details) was sent and filled in by each partner. The questions asked were related to their perspective on commercial and non-commercial exploitation of the results and were oriented towards understanding how market-driven the results are. The results of the survey were used as a basis to organise the first exploitation workshop, which is described in Section 4.

3.1 Commercial vs. Non-Commercial Exploitation

The project partners were requested to provide their perspective on the exploitation of the results, to better understand whether they intend to exploit the results commercially or not, and in each case requesting them to be more precise on the type of exploitation they envision. The results of the question (out of the fifteen answers collected) regarding commercial exploitation are shown in Figure *4*. The options the partners were given were the following:

- Approach customers directly with the results of the project.
- Find individual partners to help me exploit my results (e.g., a larger service provider)
- Integrate my results into my organisation's existing product portfolio.
- Use the project results in follow-up commercial R&D activities.
- Adopt results within my organisation.
- Support results and partners indirectly with the core services of my organisation (legal, standardisation, biz development etc.).
- No Commercial Exploitation.

Commercial exploitation Please list the activities that your organization will undertake, during and after the end of the project:

15 responses
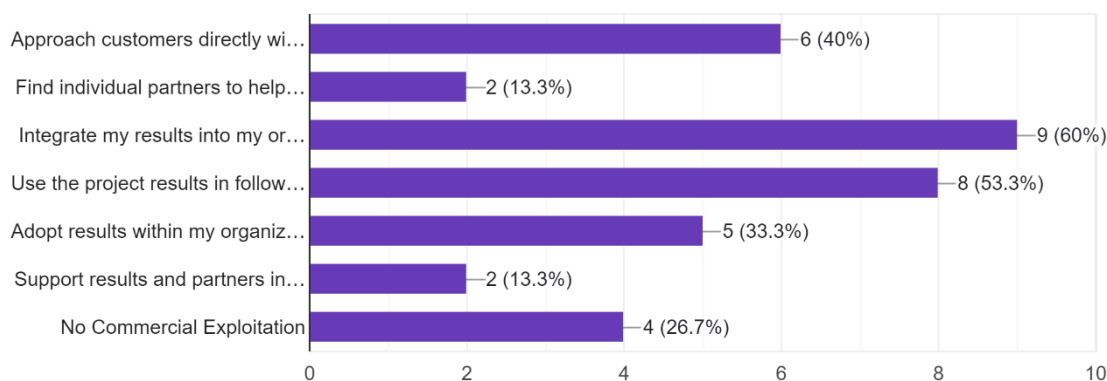
Figure 4. Commercial Exploitation questions on the Exploitation Survey shared among partners.

A general conclusion is that most of the partners plan to integrate the developed results into their organisation's existing portfolio, as well as use the project results in upcoming commercial R&D activities. Interestingly, a good number of partners are willing to approach customers directly with these results, which is in line with the exploitation approach proposed by FundingBox, whose focus is to accelerate the customer and market readiness of the project results by directly benchmarking with potential customers and early adopters.

Hence, the following question in the survey, which deals directly with the pool of potential customers the partners have, led to a positive outcome. A considerable number of partners either already have identified clients or could potentially have (see Figure 5). Interestingly, one partner, Multiscan indicated this is not applicable to them, which may arise from the fact that they are one of the pilots, and hence an "internal early adopter" that will benefit from the developments of AIDEAS. This will help in the upcoming stages of the Exploitation methodology of AIDEAS, particularly when launching the EoI to try and probe the market interest in the developed solutions.

Market-driven Do you have clients (or potential ones) interested in the results you're working on within AIDEAS?
15 responses
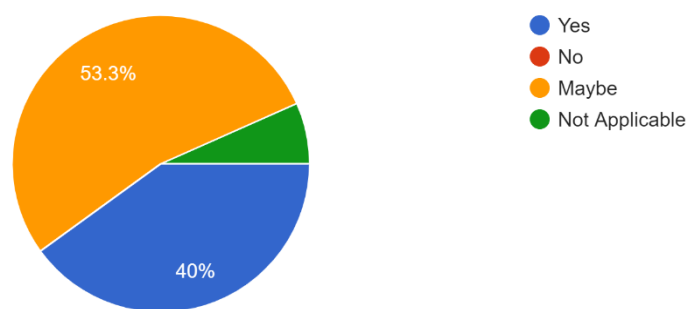
Figure 5. Analysis of the current knowledge of potential clients in the portfolio of the AIDEAS partners

Lastly, partners also indicated their non-commercial interests in the project results. A majority of the partners will use these results as part of non-commercial research activities (see Figure 6), and therefore their strategy for following-up on these results is to find more public funding to reach a higher TRL, meanwhile contributing to the research and scientific community.

Non-Commercial exploitation Please list the activities that your organization will undertake, during and after the end of the project:
15 responses
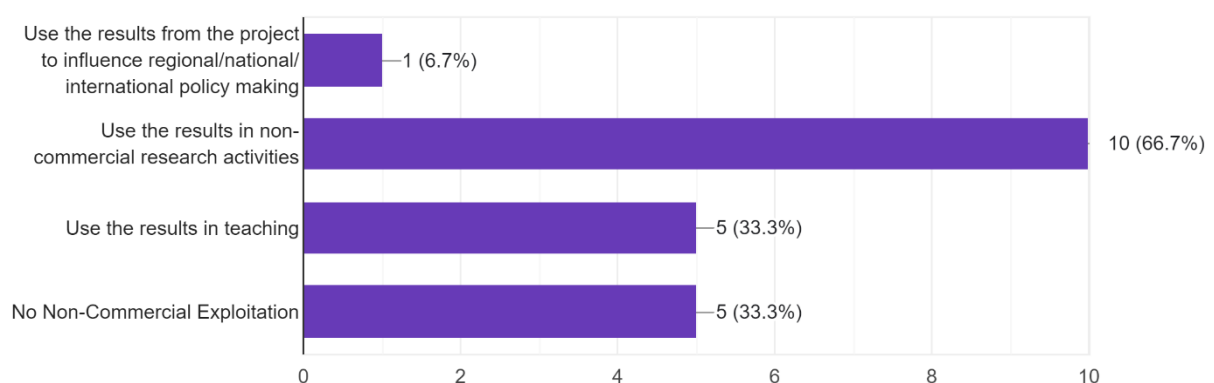
Figure 6. Non-commercial exploitation intentions by the partners

4. Mapping of AIDEAS' Key Exploitable Results (1st Exploitation Workshop)

After the preparatory work with the exploitation survey was completed, the partners gathered online to carry out the 1st Exploitation Workshop: The KER Mapping Workshop. This workshop was hosted online, on February 22, 2023, using the online collaborative tool MIRO (all results are accessible in the following [MIRO board](#)). It allowed partners to jointly revise the results of the project, prioritise them and clarify their interrelations. The goals of the workshop were the following:

- Initiate the discussion among partners regarding the AIDEAS exploitation methodology.
- Position partners on the AIDEAS exploitation landscape.
- Visualise the interdependencies between OERs and partners and align their objectives.
- Prioritise the AIDEAS results based on their market readiness and business potential.
- Develop a timeframe and scope of which solutions will be ready before the Expression-of-Interest call (planned to be launched before M22).

All the steps addressed in the workshop and its outcomes are described in the next subsections.

4.1 Exploitation landscape

4.1.1 Joint vs. individual exploitation

The first action was oriented to position the partners on the exploitation landscape based on their interest towards joint or individual exploitation and their interest in investing in commercialisation activities going forward after the end of the project (Figure 7). The answers provided by the partners were generic, not based on a specific result, and had the objective of visualising the level of involvement of each partner towards the AIDEAS results. The following concepts were addressed:

- **Joint Exploitation:** defined as working towards licensing or creating a startup with various partners involved.
- **Individual Exploitation:** defined as commercial or non-commercial exploitation of the results of the project (publications, policy recommendations, standards, etc.) involving one partner.

- **Interested in Investing:** defined as in-kind or monetary contributions to the future commercial activities of the result to support it in its development.
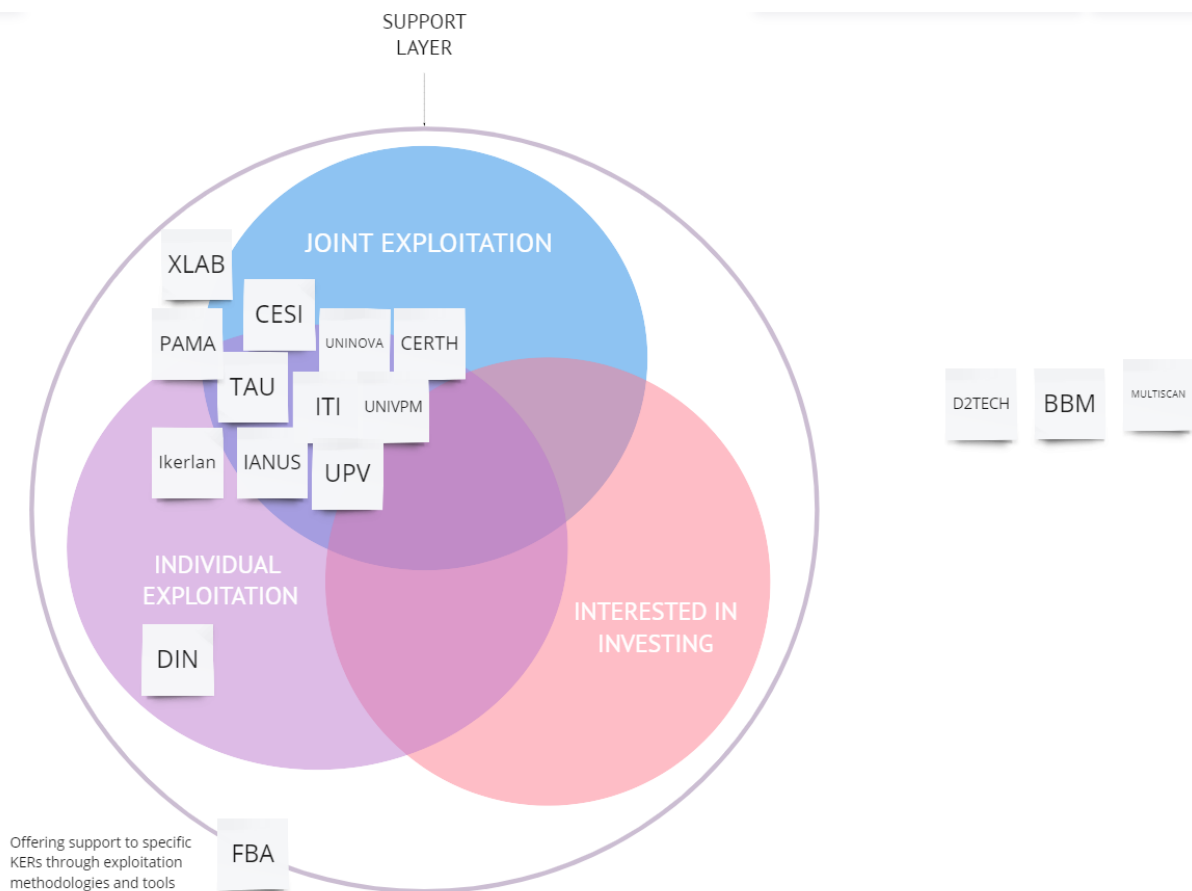
Figure 7. AIDEAS partner positioning on the exploitation landscape

Based on the inputs obtained, the partners can be divided into 3 main groups:

- Partners interested in both, joint and individual exploitation, but not yet ready to invest (depending on the outcomes of the results): TAU, CESI, UNINOVA, CERTH, UNIVPM, UPV, IANUS, ITI, PAMA, and XLAB.
- Partners interested only in individual exploitation, but not yet ready to invest (depending on the outcomes of the results): IKERLAN, and DIN.
- Supportive partners: companies that usually are not the owners of the IP, but rather are supporting the consortium with services such as standardisation, legal, market analysis, exploitation methodologies and other tools. The supportive partners are:
  o **FBA:** they will support partners in the dissemination and exploitation path of AIDEAS.
  o **DIN:** even though they expressed their interest in individually exploiting the results of the project, they play a crucial transversal role. Their task is to assist with all the activities related to standardisation (in particular, under Task 8.7, which will be reflected in D8.2 and D8.5), which are essential to guaranteeing a successful exploitation of the project results.

It should be noted that, at the moment, no partner shows willingness to invest in any result of the project, besides the already committed effort. Additionally, as can be observed in the figure,

there are three partners which should still decide along the project execution where to position themselves in the exploitation landscape. This is natural, and some changes are expected as the project evolves, as the interests of each partner will solidify. An updated version of the partner's positioning will be presented in further reviews of the Exploitation Plan (in the upcoming deliverables D8.3 and D8.4).

4.2 Results and partner interdependencies

The next action was intended to clarify the exploitable results of the project and the partners' interdependencies within these results. The purpose of this exercise was to confirm which partners are the leaders of each result's development (therefore also consequently the main IP owners) and the partners they need to collaborate with.

For this exercise, the partners were divided into 4 groups, one for each of the KERs defined, except for KER 5 – AIDEAS Machine Passport, which has no associated OERs (although due to its transversality to all project results, it was analysed in all four groups):

- **KER 1 – AIDEAS Industrial Equipment Design Suite**
- **KER 2 – AIDEAS Industrial Equipment Manufacturing Suite**
- **KER 3 – AIDEAS Industrial Equipment Use Suite**
- **KER 4 – AIDEAS Industrial Equipment Repair-Reuse-Recycle Suite**

4.3 Business Potential Assessment of AIDEAS results

The prioritisation of AIDEAS results is essential to track the most promising results of the project in terms of commercialisation and exploitation. The goal is to understand which results are the most promising and clarify their integration in the AIDEAS exploitation strategy towards their market fit.

The first actions related to the mapping of the results described in sections 4.1 and 4.2 helped to understand the involvement of the partners and to analyse in detail the different KERs, OERs and additional results of the project. The next step was to prioritise the results by addressing three main aspects:

- **Market Readiness**, which answers the question of the expected readiness of the results during and by the end of the project (section 4.3.1).

- **Market Analysis**, which answers the question of the partners' understanding of the current and future market and how the market should be approached (section 4.3.2).

- **Experience**, which answers the question of what the partners' experience is in bringing a new product to the market (section 4.3.3)

The outcomes of this business potential assessment are analysed in Section 4.3.4.

4.3.1   Market Readiness

To define the market readiness of the results, a set of criteria was defined according to the AIDEAS exploitation methodology (Figure *8*). The criteria were the following:

- Client in place.

- Time to demonstration.
- Can be used or sold as a stand-alone product.
- Technology readiness by the end of the project.

Based on these, all 15 OERs were analysed and scored during the first exploitation workshop with partners divided into break-out rooms per KERs and discussing each of the above-mentioned criteria.
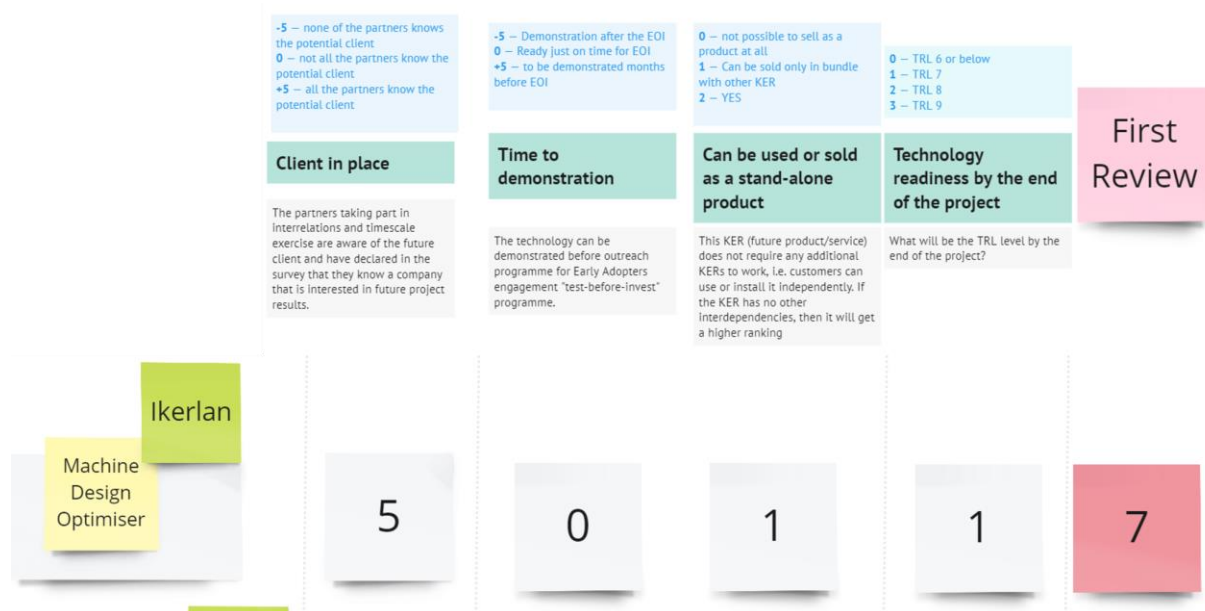
Figure 8. Example of "Market Readiness" in the ranking canvas with the OER "Machine Design Optimiser"

The scoring is generally provided as a consensus of all the partners involved in the development of the said solution. In Figure 8, it is illustrated that IKERLAN took the lead in filling in this content, as they are the leading technical developers of this solution (and they have clearly identified potential clients interested in the solution). In this section, the tendency seen is that (as observed in Section 4.2) all results aim to be ready before the EoI, the majority of them indicate they can be used as standalone solutions, and they will all be above TRL7 by the end of the project, with only one case indicating it will be above TRL8. Hence, the similarity in the scoring for all the results in this first review.

4.3.2   Market Analysis

To define the market understanding of the results, a set of criteria was defined according to the AIDEAS exploitation methodology (Figure 9). The criteria were the following:

- Barriers to entry.
- Market need.
- Market trends.
- Market size.
- Competitive advantage.
- Length of sales cycle to customer.
- How easy is it to protect IP?
- Further investment needs to achieve market readiness.
- Team in place that can take this KER to market.

In the same way as with the Market Readiness before, all 15 OERs were analysed and scored based on the above-mentioned criteria (see scoring guidelines for each criterion in Figure *9* below).

Figure 9. Example of "Market Analysis" in the ranking canvas with the OER "Machine Design Optimiser"

In this case, the answers provided by the participants are very homogeneous. They tend to be cautious or realistic but were also provided from an optimistic perspective. These assumptions are subject to changes during the course of the project, especially when the developments enter a more mature stage. In any case, it is understandable and realistic that these assumptions change during the project, and this exercise precisely serves to identify weak points or knowledge gaps that we, as the leaders of exploitation may try to fill by completing the picture through our resources (e.g., EoI or external market analysis, to name a few).

4.3.3   Experience

The last section of the numerical evaluation had to do with the experience of each partner on product development and bringing a product to the market (see example in Figure *10*. The following questions were addressed to the partners:

- Hardware: 'Is there specific hardware (sensors, optics, PLC, etc.) to implement AIDEAS solutions or does it have to be custom developed?'
- Clients: 'How many of your current clients would be interested in implementing AIDEAS solutions? 1-5 clients. 6-10 clients. >10 clients.'
- Experience: 'Have you worked on custom solutions where manufacturing data are integrated?'
- Algorithms: 'Have you developed or worked with manufacturing data analytics algorithms in industrial fields?'
- Other Industries: 'Have you implemented similar solutions in other industrial areas than those defined in Industrial Pilots?'
- Industrialisation: 'What is the period of industrialisation of the AIDEAS in which you are working? A) Less than 6 months. B) Less than 1 year. C) Less than 2 years. D) More than two years.'

Hardware	Clients	Experience	Algorithms	Other Industries	Industrialisation	Third Review
0 — Custom Developed 1 — Partly custom partly out-sourced 2 — Existing	0 — None 1 — 1-5 clients 2 — 6-10 clients 3 — More than 10	0 — No 2 — Yes	0 — No 2 — Yes	0 — No 2 — Yes	0 — More than 2 years 1 — Less than 2 years 2 — Less than 1 year 3 — Less than 6 months	
Is there specific hardware (sensors, optics, etc.) to implement AIDEAS solutions or does it have to be custom developed?	How many of your current clients would be interested in implementing AIDEAS solutions?	Have you worked on custom solutions where manufacturing data is integrated?	Have you developed or worked with manufacturing data analytics algorithms in industrial fields?	Have you implemented similar solutions in other industrial areas than those defined in Industrial Pilots?	What is the period of industrialization of the AIDEAS suites in which you are working?	
2	1	2	2	0	1	34

Figure 10. Example of "Experience" in the ranking canvas with the OER "Machine Design Optimiser"

These insights helped to establish a ranking, by knowing which OER is the closest to the market, with clients awaiting results, and it demonstrates a first step towards the market readiness of some of AIDEAS results.

4.3.4 Ranking Outcomes

Based on the scores obtained in the above-described actions, an initial ranking outline was elaborated. Figure 11 showcases the ranking matrix and contains in brackets the scores received for each of the OERs during the market viability and readiness assessment. The categorisation of the Ranking Canvas is divided into the following groups:

- **Low readiness results** – OERs that have the lowest business potential.
- **Moderate readiness results** – OERs that showed some business potential.
- **High readiness results** – OERs that have the most potential in commercial activities going forward.
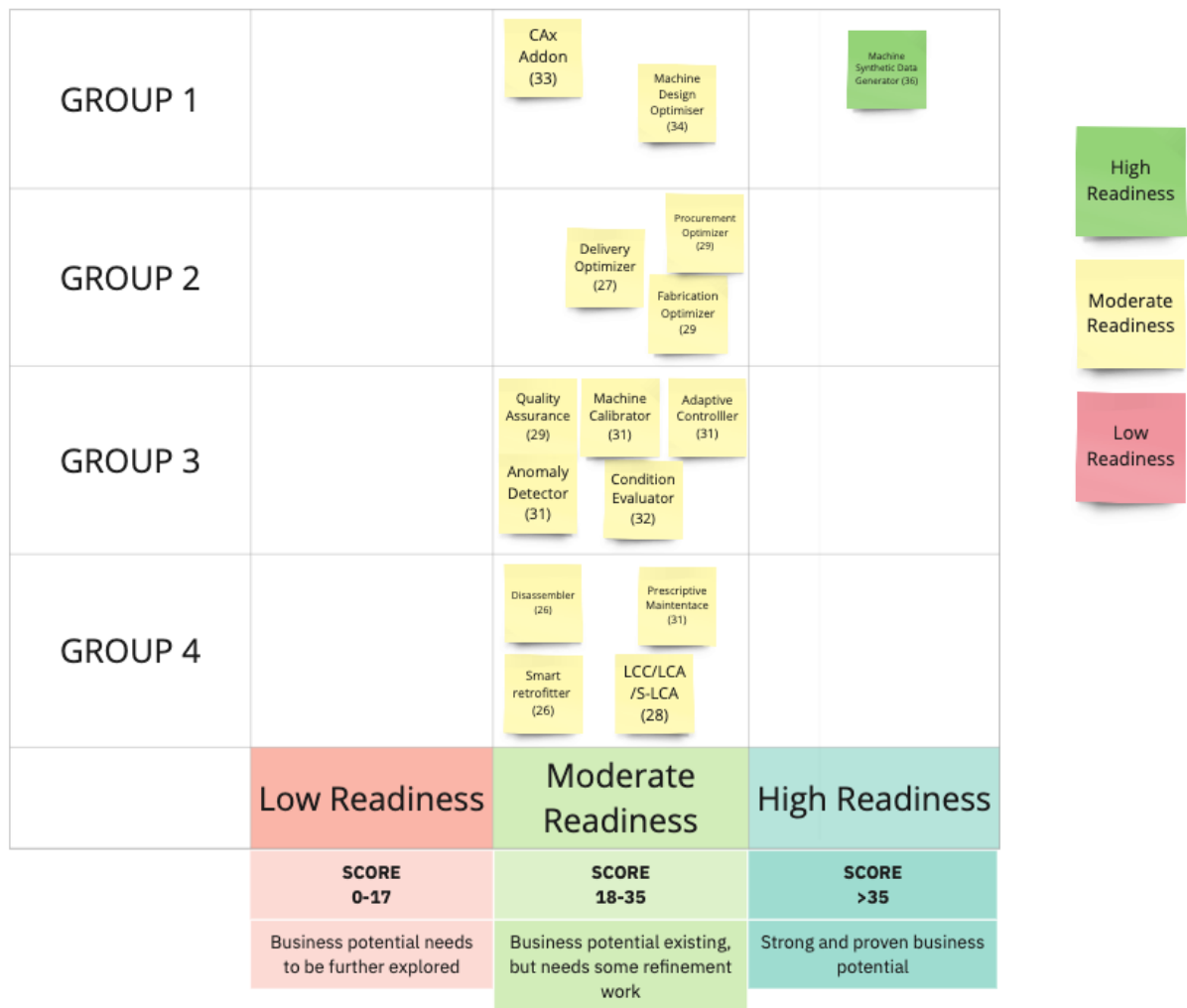
Figure 11. Ranking canvas summarizing the results of the workshop.

The following conclusions can be drawn from the outcomes illustrated in Figure 11:

- Almost all the OERs have some already identified business potential, with a somewhat defined target market and a clear path forward. This is great news from the project exploitation perspective since it allows for a better and more refined strategy to approach potential early adopters within the EoI.
- There is one result, Machine Synthetic Data Generator, which has a clear path forward, with identified potential clients interested in it. This can serve as an example to lead other solution owners to devise a successful development strategy, taking into account as early as possible the feedback from the potential market, and pivoting where necessary.
- Besides following the example of the above-mentioned result, it is clear that there is still room for improvement and for advancing the market readiness of all project results (all of the OERs, except Machine Synthetic Data Generator, are within the *Moderate Readiness* results). The proposed methodology devised in this deliverable will help in achieving that, more specifically, by bringing potential clients interested in the solutions through the EoI, the partners will be able to effectively validate the assumptions here indicated and move closer to the market. Other ways of successfully moving forward towards market readiness

may imply carrying out a thorough FTO analysis that will ensure the chosen path forward is not obviously threatened by any IP infringement or an identified relevant competitor in the field. In that sense, there will also be a continuous effort of trying to reinforce the knowledge of the industry and market, with the aim of completing the picture of each solution's exploitation plan.

It should be noted that the ranking canvas will evolve throughout the exploitation process. Thus, the next steps in the exploitation methodology will focus on the revision of this first ranking exercise to identify any eventual updates.

5. Intellectual Property Rights

Promoting innovation to support the economic advancement of society requires effective protection of IPR. The competitiveness of organisations is strongly linked to this efficiency, as it is the guarantee that the goods and services developed and marketed to the public are genuine and innovative, so that broad sections of the consumer sectors benefit. To achieve this guarantee, the economic sectors must be provided with a high-quality and cost-effective system of intellectual property (IP) protection that monitors the legal recognition, registration and use of IPR. Here, the legislative framework makes the difference. Legislation on IPR is an instrument that enables safer investments in research, innovation and creativity and, therefore, leads to greater competitiveness of the economic sectors, especially the industrial sector and the service sector. The case of the information and communications technology sector, the case of AIDEAS solutions, is especially unique in this regard, as it is one of those with the greatest innovative component and, therefore, is especially sensitive to insufficient or inadequate protection of IPR. Not only that legislation matters, but the way in which individuals or entities that lead innovation make use of the legislation is fundamental so that the levels of protection are maximised and, therefore, the risk of conflict minimised.

In this sense, the main objective of this section is threefold. Firstly, it aims to outline the EU regulatory framework for stakeholders' activities in the commercialisation of AIDEAS solutions, mainly backed by software and databases. Second, it sets out the first step in conducting a technical FTO analysis to identify comparable and competitive technologies that are currently protected by patents or pending patents. This involves analysing and extracting the main technical and business aspects of the various AIDEAS solutions, from the perspective of their IP, as a mean of carrying out a first screening in this regard. Thirdly, it briefly reports on the procedure put in place for the monitoring of IP-sensitive deliverables.

5.1 EU regulatory framework

The purpose of this section is to provide a non-exhaustive overview of the legislative framework in terms of IP protection, as well as to provide authoritative information with which to delimit the IPR that apply, in general, to software products and associated databases, and in particular, within this technological space, to the 4 suites of 16 solutions of the AIDEAS project.

The current EU regulatory framework for IPR aims to harmonize the fundamental rights of creators. By unifying the approach to IPR within the EU, these regulations close the gaps between national laws and provide adequate protection to encourage innovation and investment. The parties involved in the commercialisation of the AIDEAS suites and solutions are established and operate within this EU framework and, therefore, substantially simplifies the scope and complexity of the applicable legislation.

5.1.1 Software regulations

The EU Software Directive, also known as "Directive 2009/24/EC," [1] is a key piece of IP legislation that governs the legal protection of computer programs within the EU. Adopted on April 23, 2009, this directive harmonizes copyright protection rules for computer programs across

EU member states, aiming to establish a coherent and uniform legal framework to foster innovation and development in the software industry.

The Software Directive addresses various aspects related to the protection of computer programs and sets out the conditions under which programs can be protected by copyright. According to this directive, computer programs are considered "literary works" and are therefore automatically protected by copyright from the moment of their creation. This protection covers the expression of the program, including both the source code and object code, as well as the program's architecture, structure, and organisation.

The Software Directive, in accordance with Article 2, recognises that authorship of a computer program can be attributed to individuals or groups involved in its creation. Additionally, national legislation may allow companies or legal entities to claim authorship. In collaborative efforts, all participants share exclusive rights, each considered an IPR holder. Regarding programs created by employees under contractual agreements, the employer holds exclusive rights to the software. IP regulation depends on the specific agreement between the employer and the employee as outlined in the contract. Copyright ownership may remain with the employer, even if the employee created the program in their own time and using personal resources, provided the contract mandates the development of similar software for the employer. Clear contractual agreements between employers and employees are essential to define IP ownership for software created during employment. By clarifying each party's rights and responsibilities, potential disputes and uncertainties surrounding copyright ownership can be mitigated, fostering a harmonious working relationship.

For a computer program to be eligible for copyright protection under the Software Directive, it must meet certain requirements. Firstly, it must be original, meaning it should be an intellectual creation of its author and not a mere copy or compilation of pre-existing ideas. Secondly, the program must be expressed in a form that is perceptible visually or audibly, which includes both the source code and object code.

The Software Directive also sets forth certain limitations to copyright protection for computer programs. Specifically, the directive excludes protection for ideas and principles underlying any element of the program, including the program's interfaces. Copyright protection only extends to the specific expression of the ideas within the program, rather than the ideas themselves. Regarding the protection of "essential interfaces", the directive ensures that copyright protection does not extend to the specifications of interfaces that are necessary for the interoperability of a computer program with other software. This provision allows developers to create compatible programs that can work seamlessly with existing software.

In addition to establishing copyright protection for computer programs, the Software Directive also addresses the issue of software licenses. It allows the rightful acquirer of a copy of a computer program to observe, study, or test the functioning of the program to determine its ideas and principles, provided such actions do not infringe on the copyright holder's exclusive rights.

The EU Software Directive emphasises the principle of the "first-sale doctrine," which allows the lawful acquirer of a copy of the computer program to resell it or transfer its ownership to others. This means that once a software program is legally acquired, the copyright holder's control over

the program is exhausted, and the acquirer has the right to resell the copy without any further permission.

Moreover, the directive addresses the issue of "decompilation" of computer programs. Decompilation is the process of reverse engineering a program to understand its code and functionality. Under certain circumstances, the Software Directive allows decompilation without the copyright holder's authorisation. This exception is permitted when it is necessary to achieve interoperability between independently created computer programs or for debugging purposes. In cases where decompilation is carried out, the person performing the decompilation must observe certain conditions. For instance, they must have lawful access to the program, and the information obtained through decompilation should not be used to create a program that is substantially similar in expression to the original program. Additionally, decompilation should only be performed to achieve interoperability, and the information obtained should be kept confidential.

Furthermore, the Software Directive addresses the issue of temporary acts of reproduction that occur during the execution of a computer program. Temporary copies made in the normal course of executing a program are exempted from copyright protection. This exemption ensures that temporary copies created in a computer's RAM or cache memory during program execution do not infringe on copyright.

In conclusion, the EU Software Directive plays a significant role in harmonizing copyright protection for computer programs within the EU. By providing a consistent legal framework, the directive encourages innovation, ensures fair compensation for creators, and promotes a thriving digital economy. The directive strikes a balance between protecting the rights of copyright holders and allowing for the legitimate use and development of software products, fostering a competitive and dynamic software industry within the EU.

5.1.2 Database regulations

The EU Database Directive, also known as Directive 96/9/EC [2], is a significant piece of legislation that governs the legal protection of databases within the EU. Adopted on March 11, 1996, this directive aims to harmonize the rules regarding the copyright and related rights of databases across EU member states, creating a consistent legal framework to promote the development of database-related industries and foster innovation.

The Database Directive defines, in its Art. 1, a database as a collection of independent works, data, or other materials that are systematically or methodically arranged and individually accessible by electronic or other means. It distinguishes between two types of rights applicable to databases: copyright (Art. 3) and the sui generis database right (Art. 5, Art. 7).

Copyright protection under the Database Directive is granted to the structure of a database, reflecting the substantial investment in the selection and arrangement of its contents. This means that the original arrangement and organisation of data within a database are protected by copyright, preventing unauthorised copying and use of the database's structure.

Additionally, the Database Directive introduces the sui generis database right, which provides a separate and distinct form of protection. The sui generis right grants the maker of a database exclusive rights over the extraction or re-utilization of the database's contents. Even if the

selection and arrangement of data do not meet the threshold of originality required for copyright protection, the database maker can still claim protection for the substantial investment in obtaining, verifying, and presenting the database's contents.

For a database to be eligible for sui generis protection, it must be the result of substantial investment, either in terms of quantity or quality, and the maker must be an EU member state resident or a resident of a country that has an agreement with the EU providing reciprocal protection.

It is important to note that the sui generis right only protects against unauthorised extraction or re-utilization of the database's contents. It does not grant exclusive rights to the actual data or facts within the database. Users are still free to access and use the data independently, as long as they do not extract substantial portions of the database without permission.

The duration of individual rights to the contents of a database is subject to the duration of copyright protection for the individual works or materials contained within the database. The duration of copyright protection varies depending on the type of work and the applicable national copyright laws or other EU copyright directives. It is essential to note that the EU Database Directive does not grant a separate or fixed duration for copyright protection to the structure of a database itself. Instead, the protection for the structure is intertwined with the individual works or materials it contains, and the duration of protection for those works applies accordingly.

In terms of exceptions and limitations, the EU Database Directive includes provisions to promote access to information while safeguarding the rights of database makers. One notable exception is the "lawful use of the contents," which permits users to access and use the contents of a database for personal, non-commercial purposes, even if the database is protected by copyright or the sui generis right. The directive also allows for the extraction and re-utilization of insubstantial parts of a database for the purpose of interoperability. This provision enables users to exchange data between different software applications and services seamlessly. Furthermore, the EU Database Directive acknowledges the importance of public access to certain types of information contained in databases. It allows Member States to create specific exceptions to the rights of database makers to ensure access to public sector information. This supports the principle of open data, enabling citizens, businesses, and researchers to access and utilise publicly available information.

The Database Directive has played a significant role in promoting the development of database-related industries within the EU. By providing a standardized legal framework for copyright and database rights, it encourages investment in the creation of databases and incentivises innovation in data-driven technologies and services. This directive plays a pivotal role in the dynamic digital landscape, driving economic growth and technological advancement in the EU.

5.1.3 Types of Intellectual Properties for Software and Databases

Software products within the EU are subject to various legal mechanisms that aim to protect the rights and interests of creators and innovators. These mechanisms provide robust IP protection, incentivising software developers to invest in and commercialise their creations. Key legal figures for software and database protection in the EU include copyright, patent, trade secrets, and trademark laws. This section will provide an overview of these figures.
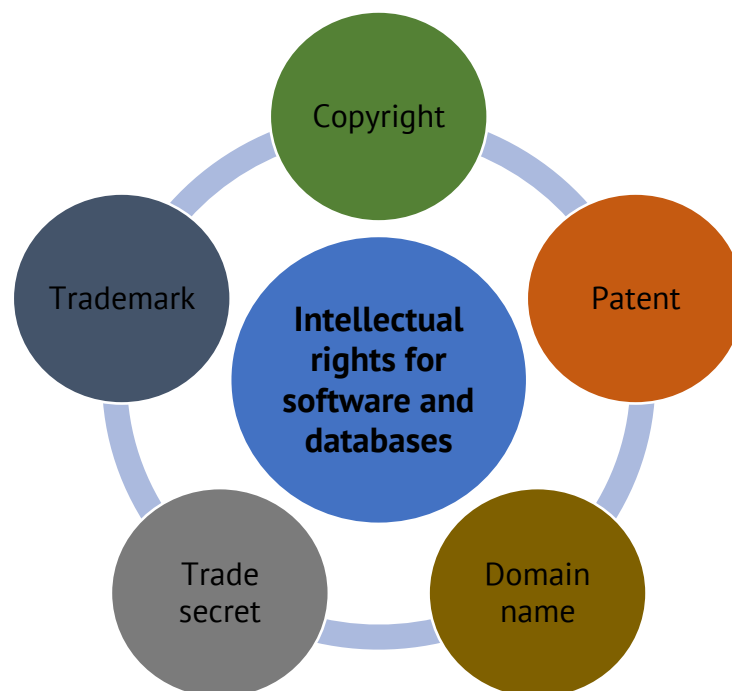
Figure 12. Key legal figures for software and databases protection

- **Copyright Protection:**

Copyright protection is a fundamental aspect for software and is governed by a range of laws and directives at both the EU and national levels. Several international legislative provisions, including the Berne Convention, the Rome Convention, the WIPO Copyright Treaty, the WIPO Performances and Phonograms Treaty, the Beijing Treaty, and the Marrakesh Treaty, protect copyright in various capacities. At the EU level, there are more than 15 legislative acts, such as Regulations and Directives, that address copyright protection.

Within the AIDEAS project, the Software Directive (Directive 2009/24/EC) [1], the Information Security Directive (Directive 2001/29/EC) [3], and the Database Directive (Directive 96/9/EC) [2] are the most significant legislative acts concerning copyright protection in relation to software. The Software Directive specifically focuses on the legal protection of computer programs and ensures their copyright protection across the EU. These legislative acts provide the legal framework for copyright protection, harmonizing the regulations for software copyright across member states.

Under the Software Directive, software products are considered literary works, granting them copyright protection. The Directive encompasses all forms of computer programs, providing exclusive rights to the creators or owners. Copyright protection is automatic upon the creation of a software program, without the need for registration. This protection enables software creators or owners to exercise control over the use, reproduction, distribution, and communication of their software to the public.

It is essential to note that copyright protection for software covers the expression of ideas within the program, rather than the underlying principles or functionality. Ideas and principles underlying any element, including the interface, are not protected under the

Directive. However, the Directive grants protection to all eligible natural or legal persons based on national copyright legislation that applies to literary works.

Regarding authorship, the Software Directive outlines that the IPR of a computer program generally belongs to the developer or group of developers who created it. The rights remain in effect for 70 years after the developer's death or the last surviving developer, in the case of a group creation. In situations where a computer program is developed within an employment relationship, the employer typically holds the sole rights, unless otherwise specified in a contract.

In summary, copyright protection is a crucial mechanism for safeguarding software products, and the Software Directive, along with other related legislation, provides the legal framework for such protection. By granting exclusive rights to creators or owners, copyright protection encourages innovation, ensures a fair return on investment, and promotes the continued development of software within the EU.

- **Patent Protection:**

The protection of software products through patents is an important aspect of IPR. Patents safeguard technical inventions related to software by granting inventors exclusive rights over their creations. In the European context, software patents are governed by the European Patent Convention (EPC) and other relevant legislation within the EU.

The decision to pursue a software patent for a software product depends on various factors and considerations. While patents provide exclusive rights and potential advantages, it is essential to evaluate whether obtaining a patent is appropriate and beneficial for a software product.

One primary factor to consider is the nature of the software invention itself. Patents are suitable for software inventions that offer technical solutions or improvements, go beyond mere computer programs or algorithms, and provide a technical effect or solve a technical problem. If the software product meets these criteria, pursuing a patent may be advantageous.

By obtaining a patent, the inventor or company gains exclusive rights to their software invention, providing a competitive advantage in the market. Patents can prevent others from using, making, selling, or importing the patented software without authorisation. This exclusivity allows the patent holder to capitalise on their innovative software product and potentially generate revenue through licensing or commercialisation.

Furthermore, patents can act as a defensive mechanism in the software industry. In a competitive landscape where numerous software products exist, having a patent can deter potential infringement claims and litigation from competitors. It provides a solid legal foundation to protect the software product from unauthorised use or imitation.

However, it is important to note that the process of obtaining a software patent can be complex, time-consuming, and costly. Patents require a detailed application describing the invention and undergoing examination by the European Patent Office (EPO). The examination process involves assessing the novelty, inventive step, and industrial applicability of the software invention. Additionally, maintaining a patent over its lifespan

may involve paying maintenance fees and ensuring compliance with patent regulations. Because of this, in some cases, alternative forms of protection, such as copyright or trade secrets, may be more appropriate for software products. Copyright automatically protects the expression of ideas within software, while trade secrets can safeguard valuable and confidential software information. These forms of protection may offer certain advantages, such as simpler registration processes or longer durations of protection. Ultimately, the decision to pursue a software patent should be made based on a thorough assessment of the software product, its potential value, the competitive landscape, and the overall business strategy.

In short, while patents can provide exclusive rights and advantages for software inventions, their use requires careful consideration that evaluates the nature of the software invention, the competitive landscape, and the overall business strategy.

● **Domain Names**

Regarding domain names as a form of IP protection, they are crucial elements in identifying and accessing websites on the internet. While domain names themselves are not typically considered IP in the traditional sense, they are valuable assets for businesses and individuals, serving as online brand identities and helping establish a recognisable online presence.

In the context of the EU, domain names are governed by various regulations and policies aimed at ensuring fair and equitable usage while protecting the rights of trademark owners and users alike. The most relevant directive in this regard is the EU Domain Name Regulation (Regulation (EU) 2019/517) [4], which establishes rules for the management and registration of domain names under the .eu top-level domain (TLD), amending and repealing Regulation (EC) No 733/2002 [5] and repealing Commission Regulation (EC) No 874/2004 [6]. Individual EU member states have their own national legislation and policies regarding domain name registration and protection. Each country may have its domain name registry responsible for managing and administering domain names under the country's top-level domain. National laws may include specific provisions on trademark protection and dispute resolution, granting trademark owners special rights in domain name disputes. Understanding both EU-level regulations and specific national laws is crucial for businesses and individuals operating within the EU to navigate domain name registration effectively and protect their IPR. Compliance with diverse legal requirements ensures proper domain name management throughout the EU.

The EU Domain Name Regulation addresses issues such as eligibility requirements for registrants, dispute resolution procedures, and the prevention of abusive registrations. Domain name registrars must implement mechanisms to prevent the registration of domain names that infringe on the rights of trademark owners. Additionally, the regulation sets out procedures for resolving domain name disputes through alternative dispute resolution (ADR) mechanisms.

Apart from the EU Domain Name Regulation, other directives and regulations at the EU level also impact domain name management and protection, particularly in the context of combating cybercrime and safeguarding consumer rights online. The EU has taken

significant steps to combat online counterfeiting, piracy, and other forms of IP infringement through various legislative measures.

While domain names themselves, as said, may not be directly considered IP, their management and protection play a critical role in safeguarding the rights and interests of businesses and individuals operating in the digital landscape. The EU's efforts to regulate the registration and use of domain names aim to reach a balance between the promotion of fair competition and the protection of IPR in the online environment.

● **Trade Secrets Protection:**

Trade secret protection in the context of the EU is also of great importance for safeguarding proprietary information related to software products and databases in some specific cases. The EU's trade secret regime is primarily governed by the Trade Secrets Directive (Directive (EU) 2016/943) [7], which aims to harmonize trade secret laws across member states.

In the realm of software products, trade secrets can pertain to valuable source code, algorithms, or unique features that give a competitive advantage to their creators. Similarly, in the case of databases, trade secrets may encompass the structure, organisation, and specific methodologies used for data retrieval and presentation, all of which are critical for businesses seeking to protect commercially sensitive information.

Under the Trade Secrets Directive, a trade secret is defined as information that is not generally known, has commercial value due to its confidentiality, and is subject to reasonable measures taken by its owner to keep it secret. This definition is applicable to both software products and databases, covering any confidential and proprietary aspects that provide economic value to their owners.

To qualify for trade secret protection, the software developer or database owner must demonstrate that they have made diligent efforts to maintain the information's confidentiality. Implementing robust security measures, using non-disclosure agreements (NDAs) with employees and third parties, and limiting access to only those who need to know are some of the reasonable steps that can strengthen the claim for trade secret protection.

The Trade Secrets Directive emphasises the importance of balancing trade secret protection with other fundamental rights and interests, such as freedom of expression, access to information, and fair competition. Consequently, the directive includes provisions that protect whistleblowers and employees who disclose trade secrets in the public interest or expose unlawful activities. Such disclosures are shielded from trade secret claims to ensure that legitimate public concerns are not stifled.

In the EU, trade secret protection is enforced through civil remedies in case of unlawful acquisition, use, or disclosure of trade secrets. The directive provides for injunctive relief, damages, and other appropriate measures to prevent further unauthorised use of the protected information.

It is essential to note that trade secret protection does not involve formal registration, as is the case with patents or trademarks. Instead, protection arises automatically as long as

the information meets the criteria for trade secret status and is subject to reasonable confidentiality measures. This makes trade secret protection a valuable tool for software developers and database owners seeking to maintain control over their IP without revealing it publicly.

In summary, the Trade Secrets Directive forms a robust legal framework for trade secret protection in the EU, covering software products and databases alike. By setting common standards and remedies, the directive encourages businesses to invest in innovation and protect their confidential and commercially valuable information. It strikes a balance between trade secret protection and fundamental rights, contributing to a thriving and competitive environment for software and database development within the EU.

- **Trademark Protection:**

Trademarks serve as valuable identifiers of the origin and quality of goods and services in general and are a significant tool of IPR within the EU, as well as for software products and databases. The protection of trademarks in the EU is primarily governed by the EU Trademark Regulation (Regulation (EU) 2017/1001) [8], which establishes a harmonized framework for trademark registration and enforcement across member states.

In the sphere of software products and databases, trademarks can be used to protect names, logos, slogans, or other distinctive signs that help differentiate a product or service in the marketplace. Trademark protection offers the owner exclusive rights to use the registered mark in connection with specific goods or services, providing a competitive advantage and strengthening brand recognition.

To qualify for trademark protection in the EU, a trademark must meet certain requirements. The mark must be capable of being represented graphically, distinctive, and not descriptive of the goods or services it covers. For software products, this may include distinctive names or logos used in the user interface or marketing materials. For databases, trademarks may be used to distinguish specific database services or software platforms from others in the market.

The EU Trademark Regulation establishes a streamlined process for trademark registration, allowing businesses to apply for registration at the EU Intellectual Property Office (EUIPO) in Alicante, Spain. Upon successful registration, the trademark owner gains protection across all EU member states, offering a cost-effective and efficient solution for protecting trademarks within the EU market. Trademark protection in the EU is granted for ten years from the date of filing the application, and it can be renewed indefinitely for successive ten-year periods. This provides long-term protection and brand exclusivity in the EU market.

In the event of trademark infringement, the EU Trademark Regulation provides for enforcement mechanisms to protect the rights of trademark owners. Trademark owners can take legal action against infringers, seeking remedies such as injunctions, damages, or orders for the removal or destruction of infringing goods or materials.

In the EU, trademark protection is subject to certain exceptions and limitations. For instance, the regulation does not grant exclusive rights to trademarks that conflict with

prior existing rights or generic terms commonly used to describe a product or service. Additionally, trademark protection does not extend to signs that lack distinctiveness or have become customary in the trade.

Furthermore, the use of trademarks may be allowed in certain circumstances, such as nominative use, comparative advertising, or exhaustion of rights. Nominative use permits the use of a trademark to identify the genuine goods or services associated with that mark, while comparative advertising may use trademarks for a fair comparison between products or services. Exhaustion of rights occurs when a trademark owner cannot prohibit the further commercialisation of goods that have been lawfully placed on the market within the EU.

It is important to note that the protection of software and databases often requires a combination of several of these legal forms, be they copyrights, patents, domain names, trade secrets or trademarks. The interplay between EU and national laws may introduce variations in the scope and enforcement of these IPRs. As such, it is essential for businesses operating within the EU to be aware of the specific legal frameworks in individual member states, because IPR and their enforcement mechanisms can vary significantly among different jurisdictions. This approach ensures that software and database developers can effectively navigate the complexities of IP protection and maximise the value of their innovative solutions while complying with the applicable laws in each EU member state.

5.2 Freedom to Operate Analysis Procedure

An FTO analysis is a comprehensive and systematic process conducted to assess potential legal risks and IP conflicts associated with bringing a new product or technology to the market. The primary objective of an FTO analysis is to determine whether the intended product or technology infringes upon existing patents, trademarks, copyrights, trade secrets, or other proprietary rights held by third parties, and to identify possible obstacles that may hinder exploitation or expose the company to costly litigation.

The FTO analysis is a multi-step process that begins, in the first step, with a thorough assessment of the product or technology in development from both technical and business perspectives. This involves, on the one hand, assessing core functionalities, innovations and technical challenges to identify potential patent infringements and ensure uniqueness, and on the other hand, an assessment from a business view that considers market viability and competitive advantages. The second step is to conduct a search for patents and other IPRs in potential conflict with the product or technology under development, including a comprehensive review of global databases and sources. In the third step, the results obtained from the previous search are carefully evaluated to identify potential risks and opportunities in terms of claim scope, coverage and remaining protection, in order to guide further decision-making. Finally, an IPR strategy is established to protect and manage IP, covering registrations, collaborations and monitoring measures, and leading us through the different alternatives, such as free product or technology development, licensing, design modifications or patent invalidation, among others. This strategy should maximise the value of intellectual assets and be aligned with long-term business objectives.

Ultimately, the FTO analysis serves as a vital tool to mitigate legal uncertainties and ensure that innovative products and technologies can be brought to market without infringing on existing IP rights. Through a comprehensive and meticulous examination of the IP landscape, businesses can make well-informed decisions that support successful exploitation and protect against potential legal challenges, fostering a conducive environment for innovation and growth.
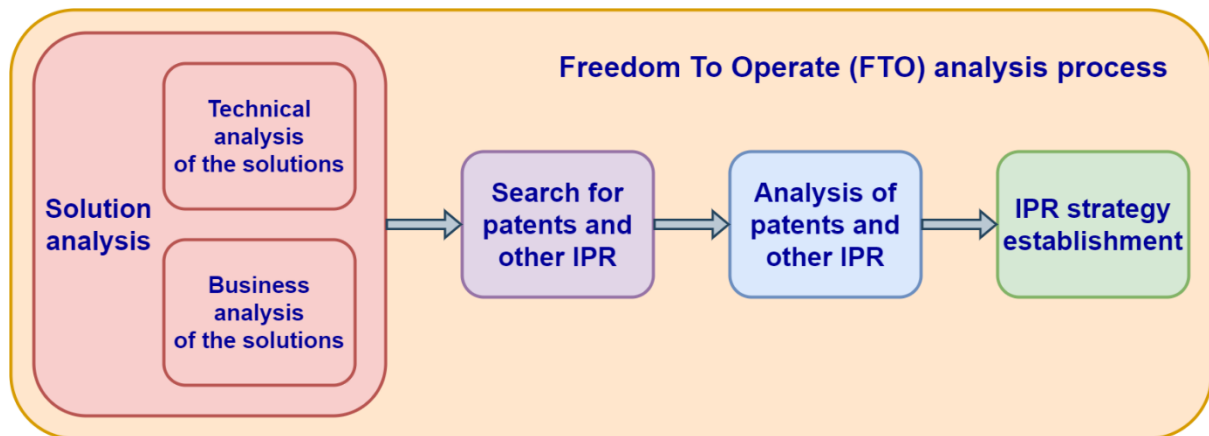
Figure 13. Freedom To Operate (FTO) analysis process.

5.2.1 Technical and business analysis of the solutions

In the first instance, it is essential to conduct a thorough assessment of the product or technology under development, both from a technical and business point of view. The technical analysis aims to delve into core functionalities, underlying innovations and technical challenges in order to assess potential patent infringements and ensure uniqueness in the market. Simultaneously, a business-oriented assessment considers market viability, competitive advantages and commercial opportunities, thereby facilitating strategic decision-making. By integrating both perspectives, organisations can make informed decisions that effectively mitigate IP risks and maximise opportunities for successful market entry. A thorough pre-search analysis establishes a solid foundation for the subsequent search for patents and other forms of IP.

5.2.2 Search for patents and other forms of intellectual property

The second phase of the FTO process is the search for patents and other forms of IP, which involves conducting a comprehensive examination across various databases and sources. The objective is to identify existing patents, trademarks, copyrights, or other relevant IPRs that could potentially impact the freedom to operate.

During this phase, specialized search tools and databases are utilised to perform an exhaustive search. Examples of commonly used databases are the European Patent Office (EPO) database, the United States Patent and Trademark Office (USPTO) database, or the World Intellectual Property Organisation (WIPO) PatentScope database. WIPO's PatentScope database is particularly noteworthy, as it provides access to a vast collection of patent documents from around the world. In addition to these widely used public databases, there are also notable private databases available, such as Derwent Innovation, Questel Orbit, PatSnap, or Clarivate's Web of Science. These private databases offer comprehensive patent and IP information, advanced search capabilities, analytics tools, and valuable insights into the IP landscape. Researchers and

businesses can leverage these databases to conduct thorough IP searches and make informed decisions regarding their freedom to operate and IP strategies. Other sources for the search include scientific publications, technical literature, product documentation, and industry-specific databases. By utilizing a combination of these resources, businesses can gather comprehensive information on existing patents and IP assets.

The search is conducted using specific search parameters and keywords related to the technology, product features, or functionalities under consideration. Different search strategies may be employed, including keyword-based searches, classification-based searches, and citation-based searches. These strategies help refine the search results and focus on the most relevant IP assets.

The results of the search have to provide valuable information about existing patents and other IP assets that may pose risks or limitations. Each identified patent or IP asset has to be thoroughly reviewed and evaluated to determine its relevance and potential impact. This examination should include analysing the scope of patent claims, geographical coverage, remaining duration of protection, and potential infringement risks. The results assist in identifying potential conflicts or areas of overlap between the developed product or technology and existing IP rights. This information helps businesses make informed decisions regarding their freedom to operate, such as considering design modifications, exploring licensing opportunities, or developing strategies to avoid infringement. It ensures that businesses can navigate the market successfully while minimising the risk of infringing on existing IP rights.

5.2.3 Analysis of patents and other IPR documents

Once the search results are obtained, a critical step in the FTO process is to carefully review and evaluate the identified patents and other forms of IP. Here the objective is to determine whether these IP assets cover the specific features, functionalities, or technologies embedded in the product or technology under consideration.

During this evaluation, a comprehensive comparison of claim scope, geographical coverage, and remaining duration of protection must be conducted. This analysis helps assess potential risks or opportunities associated with the identified patents and IP assets. Based on the findings of the evaluation, a risk assessment is derived. This assessment must outline the likelihood and severity of any potential infringement or IP conflicts that may arise if the product or technology proceeds without taking necessary precautions.

The risk assessment plays a crucial role in decision-making processes. It enables organisations to make informed choices on how to proceed with their product development strategy. For example, they may decide to pursue licensing agreements with the owners of the identified patents, modify their designs to avoid potential infringement, or even seek the invalidation of third-party patents if appropriate.

5.2.4 IPR strategy establishment

Finally, in the last phase of the FTO process, the crucial task of establishing an IPR strategy based on the comprehensive assessment of the results of the analysis is undertaken. This phase focuses on developing a tailor-made strategy to protect and manage the organisation's intellectual assets, while addressing identified risks and maximising opportunities for exploitation in the

marketplace. The IPR strategy needs to take into consideration the specific findings of the FTO analysis and should align the organisation's IP protection efforts with its long-term business objectives. It involves a series of actions and considerations to safeguard the organisation's intellectual assets and enhance their value in the marketplace.

One key aspect of the IPR strategy for software products and databases may involve applying for patent or trademark registrations to secure legal protection for innovative software functionalities, algorithms, or unique database structures. This helps prevent competitors from infringing on the organisation's IP rights and strengthens its position in the market. Additionally, the IPR strategy may involve considering licensing agreements or strategic collaborations with other entities. This allows the organisation to leverage its software products or databases by granting others the right to use or access them in exchange for royalties or other mutually beneficial arrangements. Such collaborations can foster innovation, expand market reach, and generate additional revenue streams.

Furthermore, implementing monitoring measures is an integral part of the IPR strategy. This may include regular audits to ensure compliance with licensing agreements, monitoring unauthorised use or distribution of software products or databases, and staying updated on emerging technologies and industry trends. By actively monitoring and enforcing their IP rights, organisations can identify and address any infringements or unauthorised use, thereby protecting their market position and maintaining a competitive advantage.

5.3 AIDEAS solutions analysis

As mentioned above, the analysis of AIDEAS Suites and Solutions is an important component of the search strategy, since without a thorough understanding of what is to be protected, it is impossible to find out what it may conflict with. In order to gather the necessary information for this analysis, the following procedure was followed.

- **Technical analysis:** Before starting an FTO search, it is very important to thoroughly understand the technical facets of the solution. A thorough understanding of the intricacies of the system lays a solid foundation for a more effective and informed FTO search. This understanding helps to identify potential patent conflicts and ensures a smoother process towards innovation and development. To carry out this technical analysis and in order to avoid duplication of effort, the necessary information has been extracted and categorised from the information gathered to form the AIDEAS solution viewpoints: i.e., business, usage, functional and implementation viewpoints. This information describes each of the solutions, identifies the technology areas in which they fall, lists the development languages, and identifies and describes the main components.

- **Business analysis:** The main objective of this activity is to establish the key components of the FTO search, covering details regarding the solution providers' planned commercialisation strategy. This covers aspects such as target countries, expected timeframe for commercialisation and other relevant factors. In addition, valuable information is gathered on the operating model and the types of services associated with the solution. In this case, the information was obtained through the completion by the developers of a questionnaire designed for this purpose, a task organised by the technical leader of each solution, and with the collaboration of the co-leader and the rest of the collaborating partners. The following table shows the division of technical responsibilities of the partners in the development of the AIDEAS solutions and, therefore, in the questionnaire completion.

AIDEAS Solutions	CERTH	UPV	UNINOVA	IKERLAN	TAU	UNIVPM	ITI	CESI	IANUS	XLAB
AIDEAS Machine Passport (MP)	Leader	Contributor	Contributor	Vice-Leader	Vice-Leader	Vice-Leader	Contributor	Contributor	Vice-Leader	
AIDEAS Machine Design Optimiser (MDO)	Contributor			Leader	Contributor			Contributor	Vice-Leader	
AIDEAS Machine Synthetic Data Generator (MDG)	Contributor				Contributor				Leader	Vice-Leader
AIDEAS CAx Addon (CAx)						Contributor			Contributor	Leader
AIDEAS Procurement Optimiser (PO)		Contributor	Vice-Leader				Leader		Contributor	
AIDEAS Fabrication Optimiser (FO)	Contributor					Leader	Vice-Leader			
AIDEAS Delivery Optimiser (DO)					Leader	Vice-Leader			Contributor	
AIDEAS Machine Calibrator (MC)			Leader		Contributor					Vice-Leader
AIDEAS Condition Evaluator (CE)	Vice-Leader			Leader				Contributor		
AIDEAS Anomaly Detector (AD)	Vice-Leader							Contributor		
AIDEAS Adaptive Controller (AC)	Contributor			Leader	Vice-Leader			Contributor		
AIDEAS Quality Assurance (QA-2D) / (QA-3D)		Contributor		Contributor			Vice-Leader			Leader
AIDEAS Prescriptive Maintenance (PM)			Vice-Leader	Leader		Contributor			Contributor	
AIDEAS Smart Retrofitter (SR)			Contributor			Leader		Vice-Leader	Contributor	
AIDEAS LCC/LCA/S-LCA	Contributor		Vice-Leader			Leader				
AIDEAS Disassembler (DIS)	Contributor		Vice-Leader			Leader			Contributor	

Leader	
Vice-Leader	
Contributor	

Table 1. Technical responsibility in the development of the AIDEAS solutions

The fusion of technical and business analysis helps to build a targeted search for similar existing solutions, effectively narrowing their scope. This approach increases accuracy and efficiency in identifying relevant publications and documentation.

5.4 FTO Initial screening

During this phase of the project, solution developers have provided preliminary details on the solutions they are currently developing. It is important to note that this information is subject to change and, therefore, updates will be made in the coming period to reflect future developments or modifications to the solutions.

To initiate the technical FTO process, an initial search was conducted for each of the 16 AIDEAS solutions. The search was specifically conducted in the WIPO (World Intellectual Property Organisation) database called PatentScope, known for its vast collection of patents and patent-related information.

In addition, a more in-depth analysis of some of the retrieved results was carried out to shed light on the technological fields of the existing patents. This analysis serves to classify patents and utility models according to the different technological areas to which they belong, according to the International Patent Classification (IPC) scheme. Such a classification helps to understand the state-of-the-art landscape in the different technological fields, which in turn can provide valuable information during the FTO evaluation process. This analysis also makes it possible to quickly discard results whose IPC title is clearly unrelated to the AIDEAS solutions and is therefore an important first filter. As the project progresses after M12, the preliminary search results and subsequent analysis will be updated and, above all, refined, in order to ensure the complete and accurate FTO assessment of each solution. It is essential to continuously monitor and adapt the FTO process to take into account any changes in the patent landscape.

5.5 IP-sensitive deliverables monitoring and assessment.

Monitoring of IP-sensitive deliverables refers to the systematic process of tracking and evaluating the IP aspects of specific AIDEAS project deliverables or outputs. The primary objective of this monitoring is to ensure that all IP-related requirements, rights, and obligations are being adequately addressed and managed throughout the project lifecycle.

The procedure for monitoring IP-sensitive deliverables involves several steps: 1) identification of IP-sensitive deliverables, 2) collection of information on the IP-related activities of the deliverables and their monitoring, and 3) assessment of the deliverable for disclosure.

The results of monitoring IP-sensitive deliverables are twofold. Firstly, it helps to proactively identify any potential IP risks or issues that may arise during the project's execution in the deliverable disclosures. By detecting these challenges early on, AIDEAS can take appropriate measures to mitigate risks and protect its IP assets effectively. Second, monitoring contributes to the overall IP management strategy of AIDEAS, enabling it to effectively leverage and capitalise on its intellectual assets. It ensures that AIDEAS is making the most of its innovative outputs to maximise their market value and long-term impact.

In short, monitoring IP-sensitive deliverables is a crucial aspect of effective IP management because it enables proactive identification of potential IP risks and ensures compliance with legal

and contractual obligations. By closely tracking and evaluating IP aspects of project deliverables, AIDEAS can safeguard their intellectual assets, optimise their commercial opportunities, and strengthen their overall competitiveness in the market.

5.5.1 Identification of IP-sensitive deliverables

This entails identifying project deliverables that may have potential IP implications, such as software products, creative works, research findings, or database compilations. This step helps in pinpointing the specific aspects of the project that require careful IP management. In this case, the deliverables that have been selected to support this monitoring and evaluation process are those related to the development and validation of AIDEAS suites and solutions.

Deliverable Related Number	Deliverable Number	Deliverable Name	Due Date	
D3.1	D7	AIDEAS Industrial Equipment Design Suite v1	M18	31-mar-24
D3.2	D8	AIDEAS Industrial Equipment Design Suite v2	M24	30-sep-24
D3.3	D9	AIDEAS Industrial Equipment Design Suite v3	M36	30-sep-25
D4.1	D10	AIDEAS Industrial Equipment Manufacturing Suite v1	M18	31-mar-24
D4.2	D11	AIDEAS Industrial Equipment Manufacturing Suite v2	M24	30-sep-24
D4.3	D12	AIDEAS Industrial Equipment Manufacturing Suite v3	M36	30-sep-25
D5.1	D13	AIDEAS Industrial Equipment Use Suite v1	M18	31-mar-24
D5.2	D14	AIDEAS Industrial Equipment Use Suite v2	M24	30-sep-24
D5.3	D15	AIDEAS Industrial Equipment Use Suite v3	M36	30-sep-25
D6.1	D16	AIDEAS Industrial Equipment Repair-Reuse-Recycle Suite v1	M18	31-mar-24
D6.2	D17	AIDEAS Industrial Equipment Repair-Reuse-Recycle Suite v2	M24	30-sep-24
D6.3	D18	AIDEAS Industrial Equipment Repair-Reuse-Recycle Suite v3	M36	30-sep-25

Figure 14. List of deliverables subjected to IP-monitoring and assessment.

5.5.2 Collection and monitoring of IP information.

Once the IP-sensitive deliverables are identified, AIDEAS project establishes a systematic process for documenting and tracking the IP-related activities associated with each deliverable. This includes, in the first place, recording the authorship, information about past and planned disclosures, prior art, any relevant IP registrations or applications, information on technology, market assessment, commercialisation capacity, potential customers, the team behind the development, etc. Additionally, once the information is registered, it involves monitoring any changes or updates to the deliverables that could impact their IP status.

As it is possible to observe, the scheme designed to publish the results of the development of suites and solutions is based on 4 initial deliverables in month 18, one per suite, with two additional interactions in months 24 and 36, i.e., a total of 12 deliverables. This scheme focused on suites poses a problem in terms of monitoring, as each of the solutions that make up the suites has its own entity, with different purposes, different developers and operators, and even their independent commercialisation and exploitation is contemplated. For this reason, it is considered that the monitoring of each of these deliverables requires separate monitoring sub-processes for the sections of the deliverable corresponding to each solution.

For the collection of IP-relevant information in each of these sub-processes, developers have to initially fill in a questionnaire (Appendix II) covering the above-mentioned aspects. These questionnaires are completed manually and in advance to help developers consider at an early stage how to protect their results and orient them towards the market.

Subsequently, about 40 days before the submission deadline of the deliverable, developers are requested to update the information of each questionnaire, but this time through a microsite specially prepared for this purpose. Therefore, the information initially collected is updated on a regular basis in a total of 3 iterations: month 18, month 24 and month 36, although, nevertheless, the information can be updated on an extraordinary basis whenever this is considered advisable.

5.5.3   Assessment of the deliverable for disclosure

In order to assess the deliverable for disclosure once the relevant IP information has been collected, the microsite processes the information and issues a report to be used as the basis for the assessment. From there, the following process needs to be carried out:

- **Review IP-relevant information:** Ensure that all relevant information related to intellectual property aspects of the deliverable has been collected and documented. This includes authorship, disclosures, prior art, IP registrations or applications, technology information, market assessment, commercialisation capacity, potential customers, development team, etc.
- **Check for completeness and accuracy:** Verify that the collected information is complete and accurate, and that it covers all the necessary aspects required for IP management and disclosure.
- **Assess IP risks and implications:** Analyse the potential IP risks or issues associated with the deliverable. Evaluate whether there are any conflicts with existing IP rights, potential infringements, or other legal concerns that need to be addressed.
- **Compliance with legal and contractual obligations:** Ensure that the deliverable complies with all legal and contractual requirements related to IP, including any agreements with collaborators, partners, or funding agencies.
- **Evaluate potential for commercialisation**: Assess the commercialisation potential of the deliverable. Determine if it has market value and if it can be leveraged for long-term impact and competitiveness in the market.
- **Mitigate IP risks:** If any IP risks are identified, take appropriate measures to mitigate them.
- **Update IP information**: Make sure that the IP-related information for the deliverable is updated regularly, especially before submission deadlines and any significant changes to the deliverable.
- **Align with the overall IP management strategy:** Ensure that the deliverable is aligned with the broader IP management strategy of AIDEAS.

- Once the assessment is completed, a final **GO/NO GO decision** will be made, determining whether the deliverable meets the IP management requirements and is ready for disclosure. If the deliverable is approved (GO), the findings will be communicated to relevant stakeholders, especially the development team and the AIDEAS coordinators. If IP risks or issues are identified, necessary mitigation measures will be taken before proceeding with the disclosure. The GO/NO GO decision ensures that the deliverable disclosure process is robust and in line with the overall AIDEAS IP management strategy.

By following these steps, AIDEAS can effectively monitor and assess its IP-sensitive deliverables, proactively address potential risks, and optimise the commercial opportunities presented by its innovative outputs. It will contribute to the overall success of the project and the effective management of intellectual assets.

6. Next Steps in the Exploitation Activities

In this section, we will revisit the preliminarily drafted Business Model, understanding the starting point of the exploitation efforts, and we will have an overview of the upcoming steps to reach to a validated Business Model backed by both the perspective from the consortium partners (i.e., the offering party) and the potential early adopters (i.e., the customers).

6.1 Towards an Actionable and Validated Business Model

The exploitation process in the AIDEAS project started with the drafting of the preliminary Business Model, which was defined while at the proposal stage, and is incorporated into the DoA. During the project, as outlined in this deliverable, this business model will be revisited and modified according to the evolution of the developments, findings, and early adopters' feedback that will be gathered through the devised exploitation methodology. The single most important and decisive step of this methodology is the EoI, which will serve to validate all the pre-established hypotheses and assumptions. The final goal is to build an actionable and useful business model that will allow the consortium to maximise the chances of succeeding in exploiting the results of the project.

Nonetheless, it is important to revisit the starting point of the exploitation strategy by understanding the currently drafted business model. In this case, due to the high uncertainty and the many open questions appearing at an early stage of development (such as at the proposal stage), it made more sense to utilise the Lean Canvas to land all the preliminary business hypotheses. The Lean Canvas is a tool utilised by the Lean Startup methodology to devise business models of any endeavour, particularly at the earliest stages. In this case, it was built thanks to the input of all partners involved.
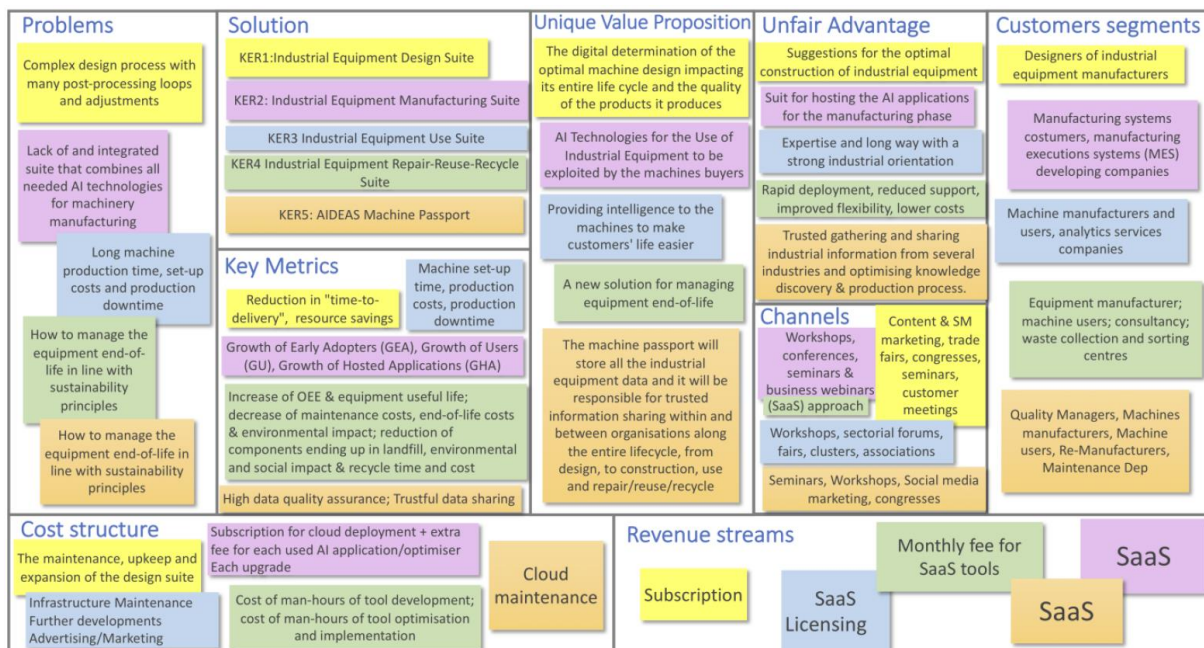

Figure 15. Complete Business Model Canvas for all AIDEAS' KERs built at proposal stage.

By having a look at the initially drafted business model, one can summarize the AIDEAS offering as follows:

"AIDEAS Suites are software toolkits based on AI technologies for supporting the entire life cycle (design, manufacturing, use and repair/reuse/recycle) of industrial equipment as a strategic instrument to improve sustainability, agility, and resilience of the European machinery manufacturing companies."

At the proposal stage, the foreseen joint exploitation strategy by the consortium was the uptake by commercial partners like IANUS, IKERLAN, CESI, UPV (via EXOS), CERTH (via INFALIA) who would bring the AIDEAS solutions to the market. The presented strategy was based on answers from a survey that was gathered from all participating project partners, specifically focusing on the owners of the KERs.

Of course, such strategy may change during the course of the project, particularly thanks to the exploitation methodology proposed, which will take into account all perspectives possible: the business interests of the partners, the IPR exploitation strategy, and the feedback from potential early adopters.

As a matter of fact, as indicated before, the ultimate goal of the proposed exploitation and IPR monitoring methodology is to obtain a useful and actionable Go-to-Market strategy, and that will materialise through the actions here related. At the moment, as explained in sections 3, 4 and 5 of this deliverable, during the first 12 months of the project, we have had the opportunity to: revisit the exploitable results, understand their market readiness, have an initial vision of the IP landscape and what results may be sensitive with respect to potential disclosures, and also start analysing the value proposition and competitive advantages of each AIDEAS result. The final Go-to-Market strategy will be composed of a Business Model (or a set of Business Models) that will encompass all of these initial findings with the results of the upcoming activities in the exploitation tasks, which are explained in detail in the forthcoming section.

6.2 Upcoming Activities

At the moment, we have gone through the initial stages of the proposed comprehensive exploitation methodology. As can be seen in Figure 16, in order to be able to compose a more mature and sensible Business Model, we first need to undertake a few further steps. The immediate next step after having completed the KER Definition/Mapping Workshop is to work together with the consortium partners in defining and clarifying the Value Proposition of each of the AIDEAS KERs.
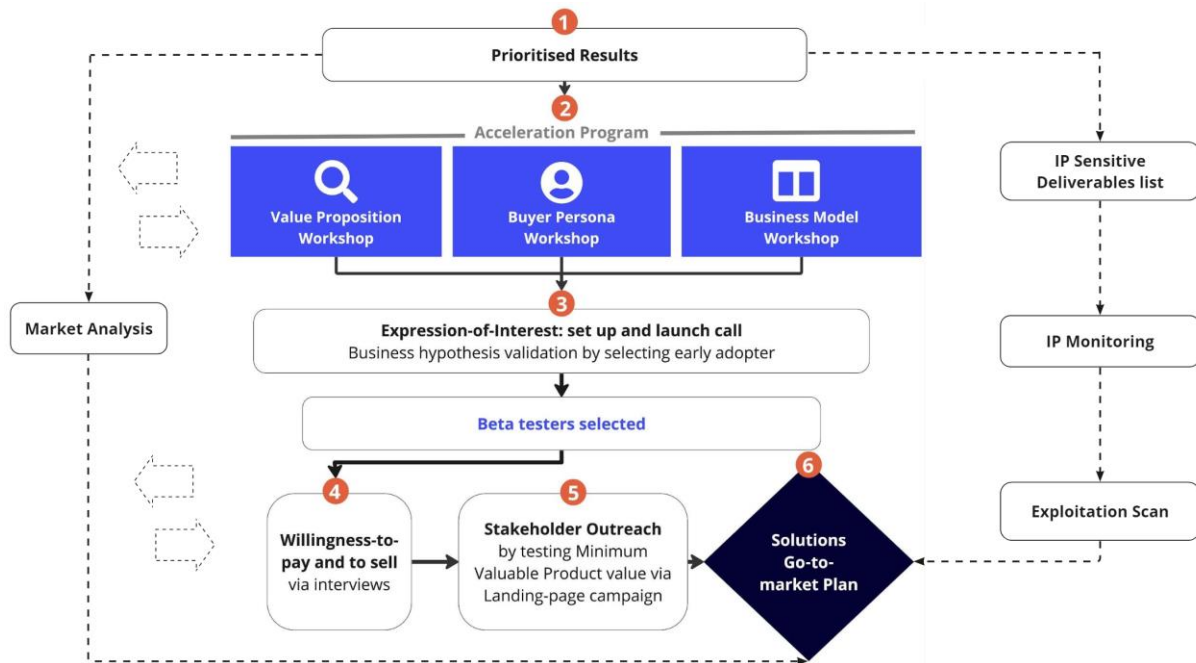
Figure 16. AIDEAS Exploitation Methodology

In practice, this is done through the Value Proposition workshop, in which the partners are collaboratively and jointly analysing the type (or types) of customer they are targeting, their tasks, pains and gains, and then, understanding how the proposed AIDEAS KER addresses those key aspects through the set of features of each offering.

In parallel, at the moment of preparation of this deliverable, the partners are completing a survey (see Appendix III in which they are asked to elaborate on a few aspects for each OER, namely: a synthetic description of the key value proposition of each result; their current competitors or alternative solutions, as well as the competitive advantage each solution brings; and finally, if already existing, a list of potentially interested customers for each solution developed. The exercise of this survey has been named "Elevator Pitch", since it aims at organizing all the key aspects and features of each AIDEAS result in a condensed, to-the-point, and understandable way.

These two upcoming actions (i.e., the "Elevator Pitch" survey, and the Value Proposition workshop), as well as the Buyer Persona & Customer Journey Workshop (the next workshop after the Value Proposition one), will help in preparing the upcoming launch of the Expression of Interest call, which aims at reaching potential early adopters that will help verify the assumptions made. By having a well-defined value proposition, a known target customer and a clear message for them, we will maximise the chances of succeeding when trying to benchmark the developed solutions with the market.

Exploitation Path
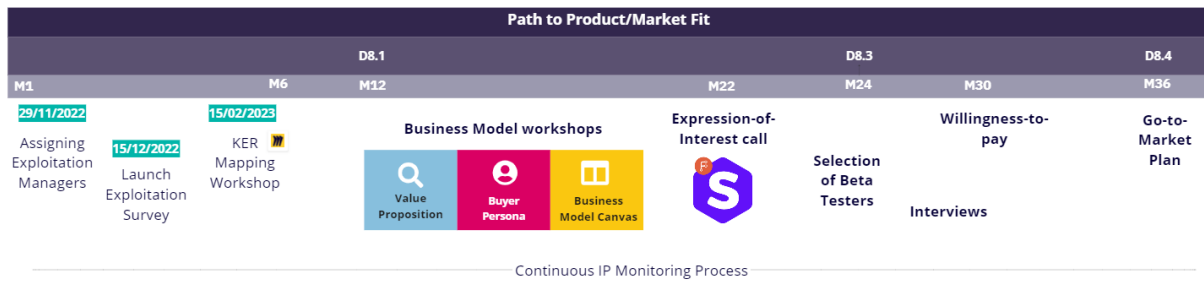
Figure 17. AIDEAS Exploitation Timeline

Additionally, it is foreseen to support such tasks by complementing, if necessary, the potential targeted market by making use of further market analysis. This may happen at any time during the exploitation process if any partner identifies a gap in market knowledge that can be reinforced by this extra activity. The final intended outcome is to have a comprehensive, solid, and actionable go-to-market strategy for the results of the project, taking into account all possible aspects within reach.

7. Conclusions and Final Considerations

A thorough and comprehensive exploitation methodology has been presented and put into place, with the ultimate goal of achieving the most successful go-to-market/exploitation plan towards the end of the project. As it has been shown, this will be achieved through a series of actions that include the perspective of the results owners (the partners), the supportive partners, and most importantly, the potential customers, with a practical and to-the-point approach. This also includes closely monitoring the resulting intellectual property generated throughout the project, so as to be able to take the necessary actions to ensure the potential exploitation paths are secured and not threatened.

In a nutshell, the following actions linked to the exploitation of AIDEAS were implemented during the first months of the project:

- A list of results with 15 OERs and a standalone KER (Machine Passport) were mapped and defined by the partners. These actions served to thoroughly describe the AIDEAS results originally listed in the DoA. Although the OERs have been sufficiently detailed to proceed with the next steps of the exploitation activities, an ongoing monitoring should be specially dedicated to elaborating on the definition of the additional results and detecting any other that may appear during the project's execution.
- Partners answered an initial Exploitation Survey where they indicated their commercial and non-commercial intentions towards the results of the project, as well as already identifying the potential customers they have in their portfolio that could be interested in each of the developed solutions.
- The first and initial exploitation workshop was held, where partners had the opportunity to further explore the interrelations of each OER, as well as to understand the readiness of such results with respect to the market.
- These market viability and readiness actions have helped the partners rank the AIDEAS results. Considering that this exercise was performed in the first 6 months of the project, this ranking could evolve as the AIDEAS results undergo the next exploitation actions. The initial scores obtained in this process will be taken into consideration in the acceleration modules, with special attention to the OERs with the lowest scores to assess their market readiness and the convenience of undergoing the next steps of the exploitation path.
- The outcomes described in this document are relevant to preparing the next exploitation steps (as indicated in Figure 17 above). One important action was to identify partners with potential clients for the AIDEAS results. The involvement of the end-users through the Expression of Interest is key in the exploitation strategy to elaborate on the AIDEAS Business Model and eventually produce a sound go-to-market plan aligned with the market needs.

- Regarding Intellectual Property Rights monitoring, the continuous internal monitoring process has been established and kicked off by distributing a questionnaire to all partners (see Appendix II). In the questionnaire, partners were asked to evaluate the sensitivity of their deliverables and results with respect to their Intellectual Property. With this methodology in place, we aim at ensuring no unwanted disclosure of critical information occurs, hence, effectively securing the exploitable assets generated during the project.
- Additionally, an initial and preliminary FTO screening has been conducted for the 16 AIDEAS solutions. To achieve this, a thorough technical and business analysis of the AIDEAS solutions was performed. Such an analysis is of the utmost importance since it allows for a very comprehensive understanding of each solution, but at the same time, detailed enough to be able to perform an FTO screening that is conclusive (the less detailed the solutions are described, the more difficult a proper FTO analysis is).

The upcoming actions in the exploitation process for the forthcoming reporting period will be especially dedicated to iterating on the Business Model Canvas originally described in the DoA and updating it according to the conclusions extracted from the next acceleration modules, as well as the feedback from the market gathered through the Expression of Interest and the interaction with the potential early adopters. Additionally, this will be complemented with the continuous Monitoring process.

References

1. Directive 2009/24/EC of the European Parliament and of the Council of 23 April 2009 on the legal protection of computer programs (Codified version). Official Journal of the European Union, L 111, pp. 16-22.

2. Directive 96/9/EC of the European Parliament and of the Council of 11 March 1996 on the legal protection of databases. Official Journal of the European Union 77, pp. 20-28.

3. Directive 2001/29/EC of the European Parliament and of the Council of 22 May 2001 on the harmonisation of certain aspects of copyright and related rights in the information society. Official Journal of the European Union L 167, pp. 10–19.

4. Regulation 2019/517 of the European Parliament and of the Council of 19 March 2019 on the implementation and functioning of the .eu top-level domain name and amending and repealing Regulation (EC) No 733/2002 and repealing Commission Regulation (EC) No 874/2004. Official Journal of the European Union L 91/25.

5. Regulation No 733/2002 of the European Parliament and of the Council of 22 April 2002 on the implementation of the .eu Top Level Domain. Official Journal of the European Union L 113, pp 1-5.

6. Regulation No 874/2004 of 28 April 2004 laying down public policy rules concerning the implementation and functions of the .eu Top Level Domain and the principles governing registration. Official Journal of the European Union L162/40.

7. Directive 2016/943 of the European Parliament and of the Council of 8 June 2016 on the protection of undisclosed know-how and business information (trade secrets) against their unlawful acquisition, use and disclosure. Official Journal of the European Union L 157/1.

8. Regulation 2017/1001 of the European Parliament and of the Council of 14 June 2017 on the European Union trademark. Official Journal of the European Union L 154, pp. 1-99.

AIDEAS Exploitation Survey
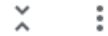
Dear Exploitation Managers of AIDEAS,

This is your **first task**: fill out this survey to give us **insights on your entities' exploitation ambitions.**

The **goal of this survey** is to update what was set in the proposal (and GA) of AIDEAS and **align with all the partners on our ambitions in terms of results and exploitation.**

It's essential to **fill-in the survey** in accordance with the **ambitions of your organisation** on the **expected results of the project.**

Image title

Which partner are you? *

1. CERTH

2. UPV

3. UNINOVA

4. Ikerlan

5. TAU

6. UNIVPM

7. ITI

8. CESI

9. IANUS

10. XLAB

11. DIN

12. PAMA

13. D2TECH

14. BBM

15. Multiscan

Overall Results of the project: also called KERs (Key Exploitable Results)   ⌄   ⋮

The KERs are the main results that are expected of the project and will involve more than one partner to be achieved. They're challenging and there is a chance of not succeeding. They are listed below. For the full description please read the [Grant Agreement](#)

Which of these results will you be working on? *

Table 10. AIDEAS Key Exploitable Results (KERs)

Key Exploitable Results (KERs)	Developed By	Commer-cialised by	How	Targeted Industry
KER1: AIDEAS Industrial Equipment Design Suite	IANUS, XLAB, IKERLAN, CERTH, CESI, UNIVPM	IANUS	SHS Plus	**Machinery and Industrial Equipment Manufacturers**
KER2: AIDEAS Industrial Equipment Manufacturing Suite	TAU, ITI, UNINOVA, UNIVPM, CERTH, UPV, IANUS	UPV	spin-off (EXOS)	**Use Cases:** Milling-boring, Stone cutting, Plastic moulding, Food sorting
KER3: AIDEAS Industrial Equipment Use Suite	IKERLAN, CERTH, UNINOVA, XLAB, TAU, ITI, UPV, CESI	IKERLAN	IKERLAN	Industrial Manufacturing Companies
KER4: AIDEAS Industrial Equipment Repair-Reuse-Recycle Suite	UNIVPM, UNINOVA, IKERLAN, CESI, CERTH	CESI	CESI	**Sectors:** Aerospace, Automotive, Ceramics, Food, Footwear, Furniture, Plastic, Stone Industry, Textile
KER5: AIDEAS Machine Passport	CERTH, IANUS, TAU, IKERLAN, UNIVPM	CERTH	spin-off (INFALIA)	

☐ KER1: AIDEAS Industrial Equipment Design Suite

☐ KER2: AIDEAS Industrial Equipment Manufacturing Suite

☐ KER3: AIDEAS Industrial Equipment Use Suite

☐ KER4: AIDEAS Industrial Equipment Repair- Reuse- Recycle Suite

☐ KER5: AIDEAS Machine Passport Suite

Individual Results of the project: also called OERs (Other Exploitable Results)   ∨   ⋮

These are individual results, i.e., what a given partner will gain from the project in terms of a new offering. It is generally an essential to-do in achieving a main result (KER).

⣿

Select which of these **offerings** (part of a main result - KER) you'll be taking part in. If you think *
nothing corresponds to your ambition please select **Other** and explain it in the next question:

☐ Machine Design Optimiser - AIMDO

☐ Machine Synthetic Data Generator - AIMDG

☐ CAx Addon - AICAx

☐ Procurement Optimiser - AIPO

☐ Fabrication Optimiser - AIFO

☐ Delivery Optimiser - AIDO

☐ Machine Calibrator - AIMC

☐ Condition Evaluator - AICE

☐ Anomaly Detector - AIAD

☐ Adaptive Controller - AIAC

☐ Quality Assurance - AIQA

☐ Prescriptive Maintenance - AIPM

☐ Smart Retrofitter - AISR

☐ LCC/LCA/S-LCA - AILC

☐ Disassembler - AIDIS

Please, describe the selected offering/s in 2-3 sentences *

Long answer text

⋮⋮⋮

Commercial exploitation *

Please list the activities that your organization will undertake, during and after the end of the project:

☐ Approach customers directly with the results of the project

☐ Find individual partners to help me exploit my results (e.g. larger service provider)

☐ Integrate my results into my organization's existing product portfolio

☐ Use the project results in follow-up commercial R&D activitites

☐ Adopt results within my organization

☐ Support results and partners indirectly with the core services of my organization (legal, standardization, …

☐ No Commercial Exploitation

Market-driven *

Do you have clients (or potential ones) interested in the results you're working on within AIDEAS?

- ⚪ Yes

- ⚪ No

- ⚪ Maybe

- ⚪ Not Applicable

---

*

Non-Commercial exploitation

Please list the activities that your organization will undertake, during and after the end of the project:

- ☐ Use the results from the project to influence regional/national/international policy making

- ☐ Use the results in non-commercial research activities

- ☐ Use the results in teaching

- ☐ No Non-Commercial Exploitation

ΛIDΞΛS

Questionnaire for IP-sensitive deliverables

WP8 – IMPACT:
Dissemination, Exploitation
and Standardisation

Task 8.6:

IPR Monitoring and
Assessment

Deliverable code

Deliverable name

AIDEAS – Questionnaire for IP-sensitive deliverables

1

Questionnaire for IP-sensitive Deliverables

Deliverable	Nº		Title	
What is your result?	Product		Service	Software	Sector

Which KER/OER is belongs to?	

Describe your result in one line below...

Describe your result in 150 words below...

Written disclosures
Please list, with dates, any past and planned written publications presenting the invention or data in this invention (journal papers/abstracts/posters/internet/other).
i) Past:
Date:
Type of disclosure:
Aspects of the invention disclosed:
Details or reference of the Journal/Conference/Seminar/Thesis:

ii) Planned:

Oral disclosures
Please list, with dates, any past and planned oral disclosures of the invention (e.g. presentations at internal or external seminars, disclosure to a company under a confidentiality agreement etc) and any demonstrations of the invention.
i) Past:

ii) Planned:

Future work
Please briefly outline any future research or development work that is planned for this invention:

Prior Art
i) Have you looked in the literature for any related articles, papers or patents? If so, please give details, listing references when possible. The information should cover the state of the art prior to your invention, and should include patent applications, key scientific literature and/or public oral communications.

ii). Please also list your own publications (including articles, abstracts, posters, www) which are in the field and which are not listed above.

If applicable, please list any third party owned materials and/or know-how that this invention uses, including the name of the third party/external collaborator that does not belong to the consortium:

Please list in descending order of importance, the features of your intellectual property that you would like to be able to stop others from making, using, or selling:

Exploitation Form
In which form you are aiming to exploit the result?

Y/N	Direct Commercialisation
	Commercialisation: deployment of a novel product/service (offered to the target markets)
	Contract research (new contracts signed by the research group with external clients)
	A new research project (application to public funded research programmes)
	Implementation of a new university - course (Note that a training course is a service)
	Indirect Commercialisation
	Assignment of the IPR
	Licensing of the IPR
	Development of a new legislation/standard
	Spin- off
	Dissemination
	Scientific publications
	Open Access repository

Section 1 – IP ownership, Protection, regulatory and investment
Have you published, patented or otherwise disclosed this invention already?
Please position your idea by placing "x" in one box below

← Already published or patented								No disclosure →	
1	2	3	4	5	6	7	8	9	10

Give details below...

Who owns this result (foreground)?

← Multiple partners								Sole inventor →	
1	2	3	4	5	6	7	8	9	10

From how many institutions? Name them...

Who previously contributed to this result (access to background)?

← Multiple inputs								Only new knowledge →	
1	2	3	4	5	6	7	8	9	10

From how many institutions? Name them…

Is your result an original, new concept or an improvement to an existing product or service?

← Improvement								Original Concept →	
1	2	3	4	5	6	7	8	9	10

Can the intellectual property of the technology be protected?

← No protection possible								Feasible IP strategy →	
1	2	3	4	5	6	7	8	9	10

Describe how your institution can finance and pursue this protection? Any legal/IP expertise on board?

How complex is the regulatory system in this area

← Not regulated								Complex regulations →	
1	2	3	4	5	6	7	8	9	10

Section 2 - Technology

What is the Technology Readiness Level (TRL)?

1	2	3	4	5	6	7	8	9	10

How many different applications can the technology be used for?

← Only one								Many →	
1	2	3	4	5	6	7	8	9	10

Is there a well-defined end-user for this technology?

← No end-users						Advanced end-users segmentation done →			
1	2	3	4	5	6	7	8	9	10

Is there a clear existing end user need for this solution?

← No need defined						Clear need defined and described →			
1	2	3	4	5	6	7	8	9	10

When will this solution be ready for market?

← Now								5 years or more →	
1	2	3	4	5	6	7	8	9	10

Will this solution have a social impact?

← No social impact								Significant social impact →	
1	2	3	4	5	6	7	8	9	10

AIDEAS – Questionnaire for IP-sensitive deliverables   4

Section 3 – Market Asessment and commercialization capacity

How well does the technology fit the existing standard production value chain?

← No fit									Perfect Fit →
1	2	3	4	5	6	7	8	9	10

What market share do you expect to take in this area in the first 5 years?

← 2.5% or less			10%		30%			50% or more →	
1	2	3	4	5	6	7	8	9	10

Is there a real, existing market need for your idea or will it have to be created by promotion?

← Promotion								Existing need →	
1	2	3	4	5	6	7	8	9	10
Give details of the real market need OR how you will create a need...									

Will commercialisation of this idea produce significant long-range benefits?

← No long range benefits					Very significant long range benefits →				
1	2	3	4	5	6	7	8	9	10
Give details of the long-range benefits below (changing the production standards, more tailor-made products, opening technology for new customers segments...)									

Will commercialisation of this idea produce significant short-range benefits?

← No short range benefits					Very significant short range benefits →				
1	2	3	4	5	6	7	8	9	10
Give details of the short-range benefits (automatization, optimization, shifting to shorter series...)									

Will commercialisation of this idea produce immediate or short-term cash returns?

← No short range returns					Very significant immediate returns →				
1	2	3	4	5	6	7	8	9	10
Give details of the gains below...									

Section 4 - Customers

Does your idea solve an existing problem?

← No problem								Perfect solution →	
1	2	3	4	5	6	7	8	9	10
Give details of the problem and how it is solved below...									

How easy will it be for customers to implement your result?

← Difficult								Easy →	
1	2	3	4	5	6	7	8	9	10

Give details of the difficulties below..(Example, needs staff resources, space,cash)...

Will changes to existing processes be needed to adopt your idea?

← Big changes								No changes →	
1	2	3	4	5	6	7	8	9	10

Give details of the possible changes below...

How strong is your market differentiator?

← Weak								Strong →	
1	2	3	4	5	6	7	8	9	10

Section 5 – The Team
The researchers have unique skills, have experience with tech transfer, and are enthusiastic about following the project through

← Disagree								Agree →	
1	2	3	4	5	6	7	8	9	10

The team has the technical skills needed to understand and develop the idea into a marketable product

← Disagree								Agree →	
1	2	3	4	5	6	7	8	9	10

The team has the business skills to develop the idea into a marketable product

← Disagree								Agree →	
1	2	3	4	5	6	7	8	9	10

The team has the marketing skills to develop the idea into a marketable product

← Disagree								Agree →	
1	2	3	4	5	6	7	8	9	10

The team has the financing skills to develop the idea into a marketable product

← Disagree								Agree →	
1	2	3	4	5	6	7	8	9	10

Section 6 – Development stage
Only limited development is required before an investor will commit

← Disagree								Agree →	
1	2	3	4	5	6	7	8	9	10

Funds are available to bridge the gap between research and the market stage

AIDEAS – Questionnaire for IP-sensitive deliverables   6

← Disagree									Agree →
1	2	3	4	5	6	7	8	9	10

Give details of the possible funding identified (private investor or other sources eg. EU funds)

The final calculation will create a brief overview of the exploitation capacity of the results/Deliverable assessed in the following way:

← Disadvantageous									Advantageous →
1	2	3	4	5	6	7	8	9	10
Weak area			*Area of improvement*			*Strong areas*			

AVERAGE WEIGHTED SCORES (example)		
IPR and regulatory	**Technology**	**Market**
4.2	7.2	9
Customers	**Team**	**Development**
7.5	6.5	3.3

Appendix III

AIDEAS Elevator Pitch of OERs

Dear Exploitation Managers of AIDEAS,

As discussed in Valencia, we would like to ask you to complete this short survey to have a better picture of the competitiveness of the results developed within the project, and how you pitch your solution to your potential early adopter / client. We have defined this as a sort of an Elevator Pitch, so we cover all the critical information in its most simplified way.

Additionally, we would like to know if you have already identified any potential client / early adopter for these results from within your network, and if yes, if you could list them. As you know, reaching out directly to the potential early adopters will give us the most valuable insights for the further exploitation of these results, and this is what we will target through the Expression of Interest call that will be launched later on during the project.

Image title

TIPS to write a killer Elevator Pitch for your solution
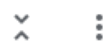
Keep it simple

The easier for people from outside your company to understand, the better. Imagine you have to explain your product to a non-technical person without knowledge in your are of expertise. How would you do it?

Focus on your ideal customer

The best product descriptions address your target audience directly and personally. You ask and answer questions as if you're having a conversation with them. You may use the words your ideal buyer uses.

What is the difference between feature and benefit?

Features are what the product or service does, describing which attributes set it apart from the competition. **Benefits** describe why those features matter and how they help the target audience. **See some examples below**.

Features vs. benefits

Product or Service	Feature	Benefit
Headphones	Wireless	No more Tangle Cards
Grocery store	Free home delivery	Save time by not having to visit the store
IT support	On-call software experts	Instant access to expertise
Smartphone	Finger sensor	Unlock your phone fast

First of all, which partner are you? *

1. CERTH

2. UPV

3. UNINOVA

4. Ikerlan

5. TAU

6. UNIVPM

7. ITI

8. CESI

9. IANUS

10. XLAB

11. DIN

12. PAMA

13. D2TECH

14. BBM

Select the Individual Results of the project (also called OERs - Other Exploitable Results) you will be working on

These are individual results, i.e., what a given partner will gain from the project in terms of a new offering. It is generally an essential to-do in achieving a main result (KER).

:::

Select which of these **offerings** (part of a main result - KER) you'll be taking part in. *

☐ Machine Design Optimiser - AIMDO

☐ Machine Synthetic Data Generator - AIMDG

☐ CAx Addon - AICAx

☐ Procurement Optimiser - AIPO

☐ Fabrication Optimiser - AIFO

☐ Delivery Optimiser - AIDO

☐ Machine Calibrator - AIMC

☐ Condition Evaluator - AICE

☐ Anomaly Detector - AIAD

☐ Adaptive Controller - AIAC

☐ Quality Assurance - AIQA

☐ Prescriptive Maintenance - AIPM

☐ Smart Retrofitter - AISR

☐ LCC/LCA/S-LCA - AILC

☐ Disassembler - AIDIS

☐ Other...

:::

First challenge: **Describe your solution** in one paragraph, one sentence, and three words. *

a. A paragraph description
b. One sentence
c. Three words

Long answer text

What is the **ideal costumer** for your solution? *e. g., type of company, sector, size, digitalisation* *
level (complete newcomer or experienced user)...

Long answer text

You have just described the ideal customer profile for your solution, so now, please, indicate *
the **list of your identified potential clients**. If possible, include company name and contact
details. We will not distribute this information and it will be used to better target the selection
of early adopters of our Expression of Interest.

Short answer text

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*

What does your product include? Explain **the main four features**:
a. Feature 1

b. Feature 2

c. Feature 3

d. Feature 4

Long answer text

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*

What are the **main benefits of your product**? Please, explain four of them:

a. Benefit 1

b. Benefit 2

c. Benefit 3

d. Benefit 4

Long answer text

Please, describe **the main competitors** there are now on the market for such OER. It would be * great if you could describe concrete features and characteristics of their offerings. If possible, include as well information about the market they target, the region they are mostly present in, as well as the market share they hold.

Long answer text

What makes your product special with respect to your competitors? *
Please, describe your **competitive advantage**, or how the OER will compare against the abovementioned competitor/s (it is always good, when possible, to indicate both qualitative but also quantitative factors, such as X% of improvement on XYZ feature)

Long answer text

Do you contribute to another OER? *

○ Yes

○ No