ESRIUM

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Deliverable 6.6
Preliminary exploitation plans

ESRIUM

SAFE AND EFFICIENT ROADS

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Abstract
ESRIUM is a multi-national project with the common goal to increase the safety and resource efficiency of mobility on the road. The key innovation will be formed by a homogeneous, accurate and recent digital map of road surface damage and road wear. Further addressed as “road wear map”, it will contain unique information, which is of value to multiple stakeholders: road operators will be able to lower the road maintenance effort by optimal planning. Further, road operators will be able to lower road wear and increase traffic safety especially for heavy vehicles: considering the market introduction of partly automated truck fleets and platoons, the precise track of these vehicles can be adjusted by communicating precise routing recommendations in- and cross-lane. Truck fleet operators following these recommendations can receive tolling benefits, and increase the general safety for their vehicle fleet. Especially with the increasing levels of autonomy, systems will utilize infrastructure support to handle the requirements of the automated driving task and additional external requests. In ESRIUM, these opportunities are addressed by utilizing C-ITS infrastructure and EGNSS based localization in planning the trajectories of such automated vehicles. Key to the ESRIUM innovation is a precision localization service, which provides reliable locations of road damages and of the vehicles using the roads. Considering a European-level business-case, only Galileo may provide such a service in homogeneous quality, even at very remote locations on the European continent.

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EXECUTIVE SUMMARY

The aim of ESRIUM is to increase the safety and resource efficiency of mobility on the road through providing an accurate and continuously updated road wear map. Such innovation will decrease the road maintenance efforts and timing by enabling road operators to make optimal planning and will take road operators a step closer to the digitalization of the road infrastructure.

The objective of WP6 is to effectively spread knowledge and information about the project research and innovation outcomes and results. This WP consists of three tasks: communication and dissemination activities, engagement activities, standards and collaborations, and exploitation management and IPR strategy. Regarding the management of ESRIUM innovations, according to the Grant Agreement (GA), the key objectives are to:

- analyses and follow relevant market developments, assessing the market potential for ESRIUM solutions.
- develop and validate new business models based on ESRIUM outcomes.
- drive technical developments towards business-relevant solutions, by providing coordinated feedback on business models viability and market take-up strategies to the other WP.
- develop and support implementation of the Exploitation Plans for the ESRIUM solutions and technologies based on the Business Plan previously developed.
- support the exploitation of knowledge assets developed in the project by the interested scientific and industry communities

To achieve these objectives, T6.3 (exploitation management and IPR strategy) is further divided in two subtasks; commercial exploitation and knowledge exploitation. According to the GA, commercial exploitation (ST6.3.1) will be based on the business plan previously developed. This subtask prepares and plans for exploitation of the ESRIUM assets and knowledge, including:

- Participation in venture capital events to present the ESRIUM solutions to attract further funding after the completion of the project and reach our solution.

The knowledge exploitation subtask (ST6.3.2) prepares the exploitation of the valuable knowledge generated in ESRIUM for further research, consultancy, education, and policy decision-making. As part of this task, we have done the following activities.

- Design and assemble a comprehensive inventory of ESRIUM knowledge, including knowledge generated during implementation, specifications, and other results from the technological research activities. This activity will proceed throughout the project, inventorying the contents of relevant Deliverables as they are released.
- Involve all partners in the discussion, and final agreement, on which content in the knowledge inventory will be open for consultation and use by external parties. The partners' decisions on specific knowledge assets will comply with the IPR policy in the Consortium Agreement and will be consolidated at the end of the project.

ENIDE has developed an exploitation handbook based on its previous experience leading the exploitation task in other EU funded projects, which can be used as a guideline by partners to define their exploitation strategy and develop both individual and joint exploitation plans, as described in ST6.3.1. The handbook is included as an annex since it contains theoretical information about the methodology, examples of channels for knowledge and commercial exploitation, and suggestions for managing IP. It is important that the reader has gone through the manual before reading the main content of the report.

Multiple workshops with partners have been conducted to explain the methodology employed and discuss the product offering and define the business strategy that can be used for exploitation of

joint results. Partners have established first individual exploitation plans and we have proposed some strategies for the joint exploitation of outcomes as a result of these workshops. Nevertheless, it is a work in progress and partners need more time to evaluate the commercial viability of the ESRIUM solution.

This deliverable summarizes the outcomes of our activities and the status of ESRIUM's exploitation at month 18, as well as the various assets and knowledge generated so far during the project's implementation. Also, it contains information about the next steps for the uptake of the ESRIUM solution by different stakeholders after the project ends. This is the initial version, which will be updated on a regular basis during the project and the last version will be reported at M36.

Note that this document is the public version of the deliverable and that within the consortium there exists an elongated version (containing a lot of confidential information) approved by the external reviewer.

Exploitation Handbook

SECTION 1: INTRODUCTION

In collaborative R&D&I projects, exploitation of project results often gets less attention than it deserves. It often gets neglected, and significantly less efforts and resources are committed to exploitation of the project results, compared to efforts committed to create those results in the first place. This disbalance creates a possibility and a risk that results produced in the project stay within the consortium and close circle of partners around them and does not reach the relevant stakeholders that could make further use of them. In order to avoid and mitigate this risk, the key is developing good exploitation strategies for all project results, independent of what is the nature of the result.

Before going any further with classification of project results and identifying suitable exploitable strategies, it is crucial to understand what exploitation is in the context of EU funded projects. European Commission (EC) **defines exploitation** to be ¨*The utilisation of results in further research activities other than those covered by the action concerned, or in developing, creating, and marketing a product or process, or in creating and providing a service, or in standardisation activities*¨ [1]

At this point, the distinction between the dissemination and exploitation should be made, since the difference is very often not as obvious, especially since there are slight overlaps between the two, and both activities often form part of the same Work Package within the project. According to EC developed scheme, that refers to definitions created in the Model Grant Agreement, the main differences are:

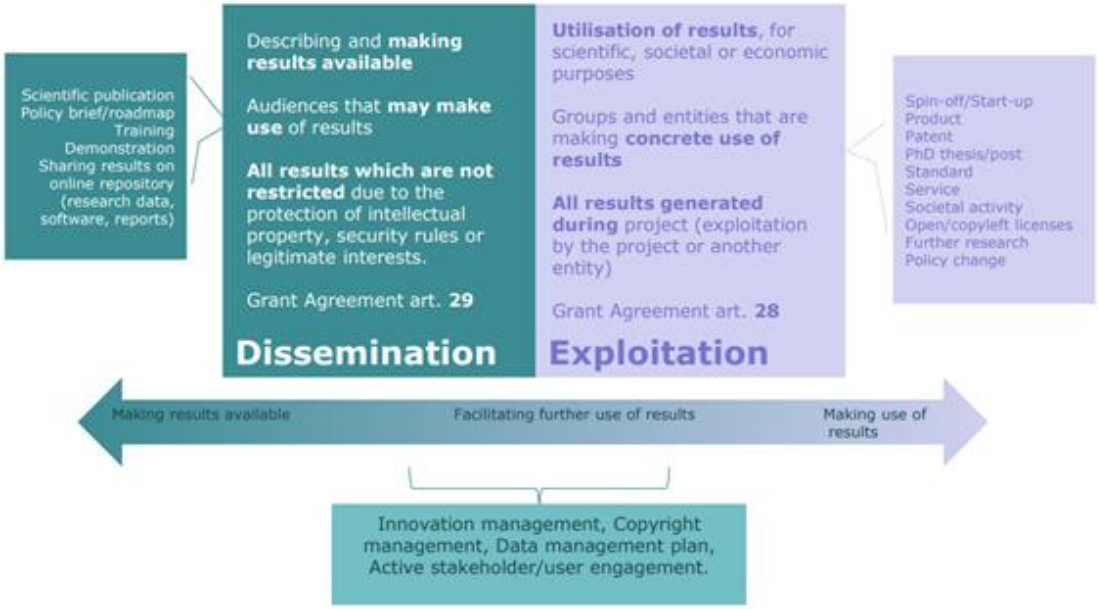

Figure 1: Dissemination & Exploitation activities in Horizon Europe: Differences, Similarities, and Overlaps. [2]

In the figure 1, the differences between dissemination and exploitation are clearly stated, with main goal of Dissemination to ¨make results available¨, while Exploitation serves the goal of ¨Making use of results¨. Additionally, various examples are listed for both categories.

In **ESRIUM** project, the **goal of exploitation** is to ensure the sustainability of the project's results beyond the project lifespan, where enhanced exploitation is seen as the strategic mean towards the success of significant economic, social, and environmental impact. Finally, the **aim of this exploitation handbook** is to provide guidelines to support the ERIUM partners in preparing, discussing, and presenting plans for the exploitation of the project's solutions and results.

SECTION 2: METHODOLOGY

2.1. IPR Management Methodology

In a knowledge-intensive, highly creative, or brand-driven businesses, a organization's well-managed IP may be worth more than its tangible assets. ENIDE provides a five-step technique for improving IP management (figure 2).

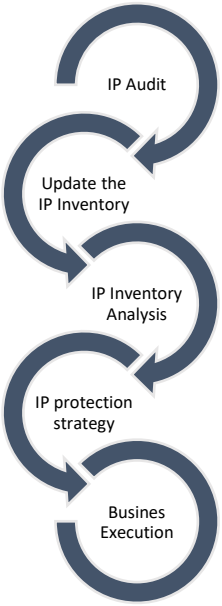

Figure 2: Proposed IP Management Methodology.

An intellectual property (IP) audit, according to WIPO, is a technique for identifying an organization's prospective IP assets in order to i) determine ownership of these assets; ii) detect any connected threats, such as IP infringement, and iii) identify underused assets.[1]

ENIDE encourages partners to conduct an IP audit at least 2 times per year during the period the organization is engaged in an EU funded project to identify the assets and knowledge the partner develops in the project and the background IP that is used. ENIDE will analyze the foreground IP inventory and will support partners in defining the strategy for protecting their rights and developing a plan for the exploitation and the use of generated IP during the project.

2.2. Exploitation Methodology

Exploitation methodology utilised in ESRIUM is based on the proven methodology developed by ENIDE within previous H2020-funded projects, updated and adapted to specific needs of ESRIUM project, taking into account the consortium composition, the scope of the project, as well as the nature of the results to be produced. The methodology used to produce the ESRIUM exploitation handbook follows the overall methodology utilized in this deliverable.

ESRIUM utilizes the 7-step exploitation methodology over the lifespan of the project, briefly presented in the Figure 7 below:

[1] World Intellectual Property Organization, retrieved from: Intellectual Property Audits (wipo.int)

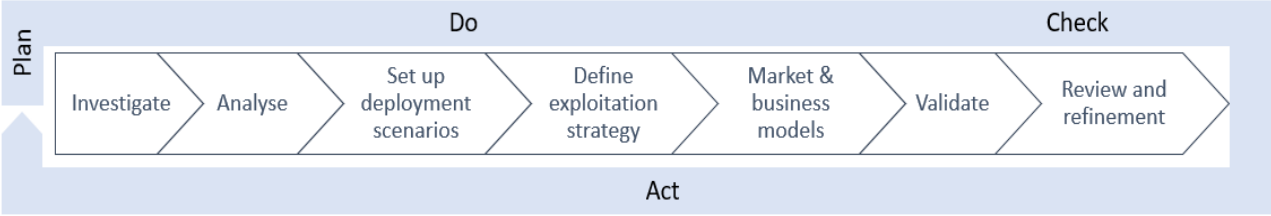

Figure 3: ESRIUM Exploitation Methodology.

The seven steps as presented in the Figure 3 are:

1. **Investigation** of relevant market segments, taking into account marketing studies and socio-economic research, as well as carrying out complementary primary research where required, as well as to study background and foreground IPs.
2. **Analysis** of competing, as well as related and complementary products and services in the market and wider community, to better understand the value proposition, the problem solved and the impact on the business environment
3. **Setting** up of deployment scenarios and use cases, market and business models for individual exploitation as well as for joint exploitation, specifying collaboration roles, costs and revenue flows, thus enabling calculation of the net return over time for each type of market player, being commercial or public.
4. **Define exploitation strategy** based on the deployment scenarios
5. Conduct **market and competitive analysis** to define a proper business model for the solutions
6. **Validation** of business models and deployment scenarios within the consortium and acquiring initial customer feedback
7. Regular **review, revision** and **refinement** of partner-specific exploitation plans and joint collaborative business plans in the light of interim project results; as well as formalization of service level and other appropriate agreements for joint exploitation among partners and third parties, including possible creation of new legal entities (joint ventures), licencing, and open source, both direct and indirect commercialization [3]

Each step is related to a specific task that has been done during the evolution of the project or that will be further carried out.

SECTION 3: IP MANAGEMENT

3.1. IP Management Strategies

Only a small percentage of companies, according to Päällysaho and Kuusisto (2008), have established a formal IP management strategy. This does not preclude most businesses from employing various IP management and protection strategies in practice. Based on the literature studies we have done, there are four major IP management strategies used by organizations: i) use of formal intellectual property rights (IPRs) such as patents; ii) use of informal ways to manage IP such as secrecy; iii) use of both formal and informal IP protection methods in combination; and iv) no (conscious) use of either formal or informal IP protection methods.

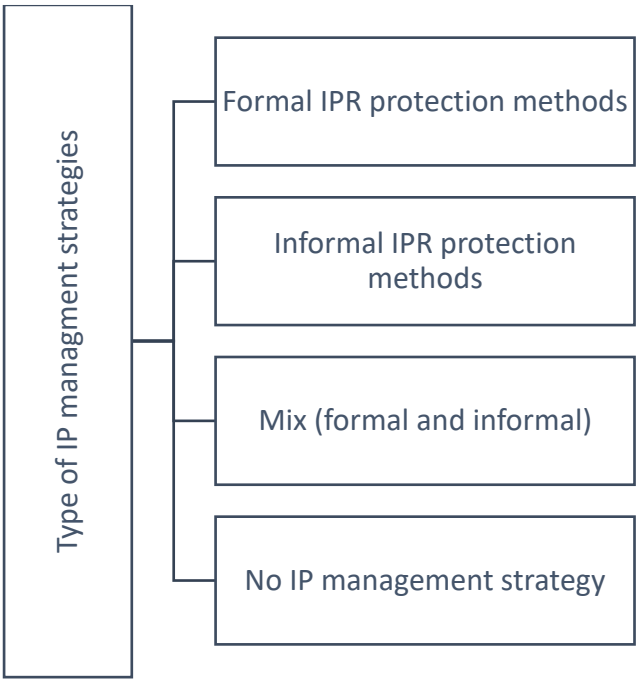

Figure 4: Types of IP Management Strategies.

Arrasvuori et al. (2015) identified 31 IP management and protection methods and classified them into three categories: formal intellectual property rights (IPRs), contracts, and informal methods and tools.

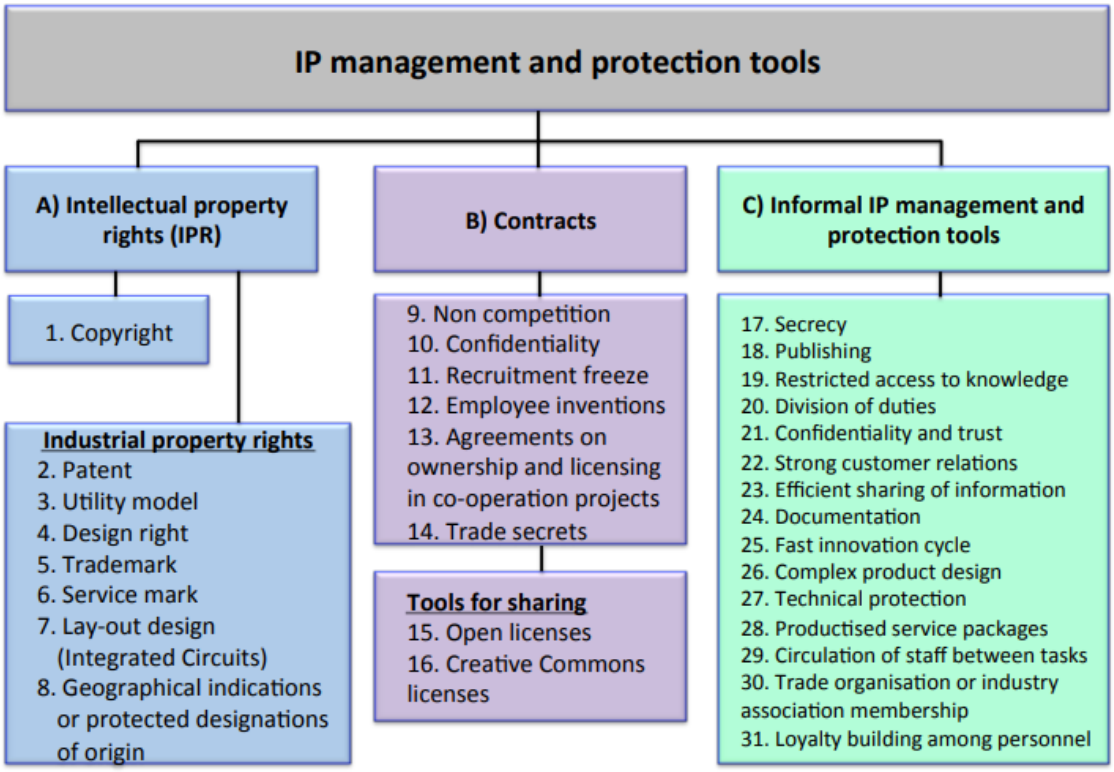

Figure 5: IP Management Tools/Channels.

The mostly widely used formal IP protection channels are patents, copy right, trademarks, geographical indications which are detailed below.

3.1.1. Patent

According to WIPO, "a patent is an exclusive right granted for an invention. Generally speaking, a patent provides the patent owner with the right to decide how - or whether - the invention can be used by others. In exchange for this right, the patent owner makes technical information about the invention publicly available in the published patent document."[2] There are three types of patents; utility patent, design patent, and plant patent. Also, the protection can be at national level or international level.

Utility patent: When most people hear the word "patent," they think of utility patents, which cover a wide range of ideas. A utility patent is a technical document that describes how a new equipment, process, or system operates in great detail. It provides a strong sort of defense. A wide range of inventions, including the broom, computers, business processes, and medications, have been protected by this patent.

Design Patent: Only the aesthetic exterior or appearance of a product with practical utility is protected by design patents. The design of the invention must be both useful and unique. A subject must be new in the sense that no single, identical design exists in the previous art. It must meet the decorative requirements and be the work of the inventor or inventors seeking protection.

Plant Patent: A plant patent is an intellectual property right that prevents others from copying, selling, or using the key qualities of a new and unique plant. An inventor (or the inventor's heirs or assigns) who has invented or discovered and asexually reproduced a different and novel variety of plant, other than a tuber propagated plant or a plant found in its natural state, is issued a plant patent.[3]

3.1.2. Copyright

Copyrights protect original works of authorship, such as literary works, music, choreographic works, graphic works, sound recordings, artistic works, architectural works, and computer software. With copyright protection, the holder has the exclusive rights to modify, distribute, perform, create, display, and copy the asset. By default, a copyright exists at the moment the asset gets created. Therefore, registering a copyright is usually voluntary, but makes the asset directly eligible for rights in case it is infringed. It is worth mentioning that assets can be issued a legal means of evidence, like the date stamp provided by i-DEPOT.[4] This date stamp 26/11/2018 27 Final version proves that a specific asset was created on a specific date by a specific organization or person, and legally holds in case of an ownership or precedence dispute.[5]

3.1.3. Trademarks

A trademark is a word, phrase, symbol, or design that distinguishes the source of products or services. In order to qualify for trademark protection, the mark must be distinctive. In general, trademark laws only protect trademarks that are being used, and the rights to a trademark can be lost through abandonment, improper licensing or assignment, or genericity. Trademark rights can also be lost through improper licensing or assignment lacking in quality control or supervision by the trademark owner.[6]

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[2] World Intellectual Property Organization, retrieved from: https://www.wipo.int/about-ip/en/
[3] The US Patent and Trademark Office, retrieved from https://www.uspto.gov/patents/basics/types-patent-applications/general-information-about-35-usc-161
[4] The i-DEPOT, retrieved from: http://www.boip.int/wps/portal/site/ideas/what
[5] The US Copyright Office, retrieved from: https://www.copyright.gov/help/faq/faq-protect.html
[6] Upcounsel, Purpose of Trademark. Retrieved from: https://www.upcounsel.com/purpose-of-trademark

3.1.4. Geographical indications

Geographical indications and appellations of origin are labels applied to commodities that have a specific geographical origin and that have attributes, a reputation, or features that are fundamentally due to that location. The name of the location of origin of the goods is usually included in a geographical indication.[7]

3.2. IPR Rights based on CA and GA

According to the GA, ¨Results¨ means any (tangible or intangible) output of the action such as data, knowledge, or information — whatever its form or nature, whether it can be protected or not — that is generated in the action, as well as any rights attached to it, including intellectual property rights.

3.3. Joint Ownership

According to CA, joint ownership is governed by GA article 26.2 with the following additions.

¨Unless otherwise agreed:

- each of the joint owners shall be entitled to use their jointly owned Results for internal research, operational activities or non-commercial research activities on a royalty-free basis, and without requiring the prior consent of the other joint owner(s), and
- each of the joint owners shall be entitled to otherwise Exploit the jointly owned Results and to grant non-exclusive licenses to third parties (without any right to sub-license), if the other joint owners are given:
  - (a) at least 45 calendar days advance notice; and
  - (b) Fair and Reasonable compensation.

The joint owners shall agree on all protection measures and the division of related cost in advance. ¨

More information can be found in GA ¨Section 3: Rights and Obligations Related to Results¨.

3.4. Transfer of Results

Based on CA, the following rights apply to transfer of results:

- Each Party may transfer ownership of its own Results following the procedures of the Grant Agreement Article °30.
- It may identify specific third parties it intends to transfer the ownership of its Results (identified in attachment (3) of CA). The other Parties hereby waive their right to prior notice and their right to object to a transfer to listed third parties according to the GA Article 30.1.
- The transferring Party shall, however, at the time of the transfer, inform the other Parties of such transfer and shall ensure that the rights of the other Parties will not be affected by such transfer. Any addition to Attachment (3) after signature of CA requires a decision of the General Assembly.
- The Parties recognize that in the framework of a merger or an acquisition of an important part of its assets, it may be impossible under applicable EU and national laws on mergers and acquisitions for a Party to give the full 45 calendar days prior notice for the transfer as foreseen in the GA.
- The obligations above apply only for as long as other Parties still have - or still may request - Access Rights to the Results.

[7] World Intellectual Property Organization, retrieved from: https://www.wipo.int/about-ip/en/

SECTION 4: EXPLOITATION OF PROJECT RESULTS

According to the European Commission, actions aimed at disseminating and exploiting research and innovation project findings are an essential and integrated aspect of the Horizon 2020 program. According to the Grand Agreement Article 28.1, exploitation is not only recommended, but also **an obligation of each partner**. It states:

*¨Each beneficiary must — up to four years after the end of the project — take measures aiming to ensure '**exploitation**' of its results by:*

(a) using them in further research activities (outside the action);
(b) developing, creating or marketing a product or process;
(c) creating and providing a service, or
(d) using them in standardisation activities. [8] ¨

Additionally, the above statement clearly shows that exploitation of project results is **not limited to the project lifespan** but goes **beyond the duration of the project**. It is expected that partners will keep utilizing the outcomes of the project even once the project has ended.

However, besides obligation to take measures to ensure exploitation, partners should be aware of many **benefits** of properly planned and executed exploitation actions, both within commercial and non-commercial exploitation:

- Improved access to new funding opportunities
- Expanded network of partners for further research opportunities, as well as wider international and interdisciplinary collaboration opportunities
- Potential new sources of income (in case of commercial exploitation)
- New or upgraded products, services, technologies, inventions, patents, etc.
- Marketing potential and improved visibility of the entity

Additionally, project results, both commercial and non-commercial, can be exploited jointly or individually:

I. **Joint exploitation -** typically refers to a situation when two or more partners mutually developed certain project output, and hence are entitled to sharing the rights to exploit the result. In such case, all contributors should be clearly listed, as well as end-users and potential clients. Such exercise should be done already at the early stages of the project and updated along the duration of the project. In case of joint exploitation, special attention should be paid to clearly defining and tracking IP rights. IP management is further defined in the section 6.

II. **Partner level exploitation –** refers to exploitation of results internally (in-house) by the creator of a specific output and utilizing it for further research purposes, integrating it in the existing products and/or services, or introducing it as whole new product or service. Typically, in EC funded projects, all partners are engaged in non-commercial exploitation, while some partners, especially industry partners, also focus on commercial exploitation of project results.

4.1. Classification of project results

In the light of H2020 funded projects, results can be understood as any output of the action, tangible or intangible, such as for example inventions, products and services, data, technologies, software, knowledge and any information regardless of the form of nature, or whether It can be commercialized.

Figure 6: H2020 possible Project Results. [1]

Based on EC´s exploitation guide, exploitation can be commercial, societal, political or for improving public knowledge and action. [4] Project partners can either exploit the results themselves or facilitate exploitation by others.

Having exploitation of project results as the key criteria, we can differentiate between **two main types of project results**, depending on whether the results have potential to be commercially exploited, or their exploitation is of different nature. In ESRIUM, both commercial and non-commercial exploitation of project results are taken into consideration. Accordingly, we differentiate **two types of exploitation** depending on which type of result is being exploited:

1. Commercial Exploitation
2. Knowledge Exploitation

4.2. Commercial Exploitation

Commercial exploitation is the exploitation of products and services developed throughout the project. Such products and services have commercial potential and can generate revenues to partner(s) involved if properly exploited. Those products are often referred as ¨Commercial Exploitable Results¨ or ¨Commercial ERs¨. Those results can be independent outputs/innovations/products/technologies, as well as part of the product/service that can be exploited as standalone exploitable result.

There are three main **commercial exploitation paths** that partners can follow:

[1] **Internal exploitation** - refers in-house (internal) exploitation strategy done by the partner who developed the specific result/output.
[2] **Collaboration** – includes various ways of collaborative exploitation paths, including Joint Venture, Spin-offs, Out-licencing, etc.
[3] **Assignment** – the type of exploitation where the IP rights are permanently transferred to another party by selling it.

4.3. Knowledge Exploitation

Knowledge Exploitation represents non-commercial exploitation of all project results that fall within what refers and is understood by ¨knowledge type¨ of results. Knowledge Results are all those outputs that cannot be commercialized and monetized directly or do not form part of a commercial process, but has evident positive societal, political and environmental impact and/or can be utilized for further improvement of public knowledge. In ESRIUM, knowledge is understood by any output generated through a scientific and research work within the project. It covers novel methodologies, processes, observations, lessons learnt, protocols, recommendations, new and alternative applications of previous know-how and/ or knowledge.

Knowledge management is crucial part and forms a bases of knowledge exploitation, since to be able to leverage and exploit knowledge, it must first be properly managed. Knowledge Management represents the process of generating, collecting, organizing, capturing, distributing, and finally disseminating knowledge to ensure that its availability to widest possible number of potential users. A well-defined and solid knowledge management process allows reliable, focused and impact-oriented preparation for successful dissemination and exploitation of the project´s results, as well as successful knowledge transfer. Enhancing Knowledge Transfer between public research institutions and third parties, (e.g., Industry, SMEs, and civil society organizations) has been defined, as one of the main areas for action by the European Commission [5]

Knowledge exploitation, falling predominantly into non-commercial type of exploitation is often overlooked in the collaborative projects, such as H2020 funded projects, and it often gets less attention compared to commercial exploitation. In ESRIUM, non-commercial exploitation is treated as highly important and given a special attention. There are **various ways to exploit** the non-commercial results of the project, for instance:

- Further research
- Education (e.g., newly developed courses; new Masters, PhD and Post Doc positions, etc.)
- Standardization, roadmaps and policy recommendations

When creating exploitation plans for specific project results, it is crucial to identify well the type of result, which will serve as a base for further steps of developing exploitation strategies, target groups, channels, etc. Each partner will have different exploitation strategy based on the nature and type of each exploitable result.

In section 5, the above-mentioned exploitation paths, as well as additional Strategies and Channels of both commercial and non-commercial exploitation will be further developed.

4.4. Exploitation Strategies and Channels

The importance of exploiting public research results can be justified by the fact that it would generate economic and social value and improve the competitiveness of both Industry and knowledge organisations at European level. The aim of the **exploitation strategy** is to create a blueprint that will ensure the results obtained throughout the project are both validated and viable for longer-term exploitation and ESRIUM findings sustainability. The exploitation strategy is typically elaborated at the beginning of the project and updated during its course. The core focus of the strategy is the creation and management of innovation to ensure the utilisation of the project findings and maximise the expected impact.

In this handbook, we understand **channel** as a tool or a mean to effectively exploit the project findings whether there is a for profit intention behind it or not. In other words, we consider both commercial and non-commercial channels for the exploitation of ESRIUM results. To this purpose, following the classification of project results defined in section 3, different exploitation strategies or channels have been defined for both commercial and knowledge R&D results:

4.4.1. Commercial exploitation channels

Commercialising public research results is of utmost importance for the sustainability of R&D&I ecosystem at EU level. It can be justified by several reasons. On the one hand, it would generate economic and social value and enhance EU industry competitiveness. On the other, it can contribute to generate an alternative income source to fund & sustain R&D activity, being public-private cooperation a key enabler to reach such a goal.

There are three typical commercial exploitation paths; internal exploitation (use by creator), collaboration, and assignment as it can be seen in the illustration below.

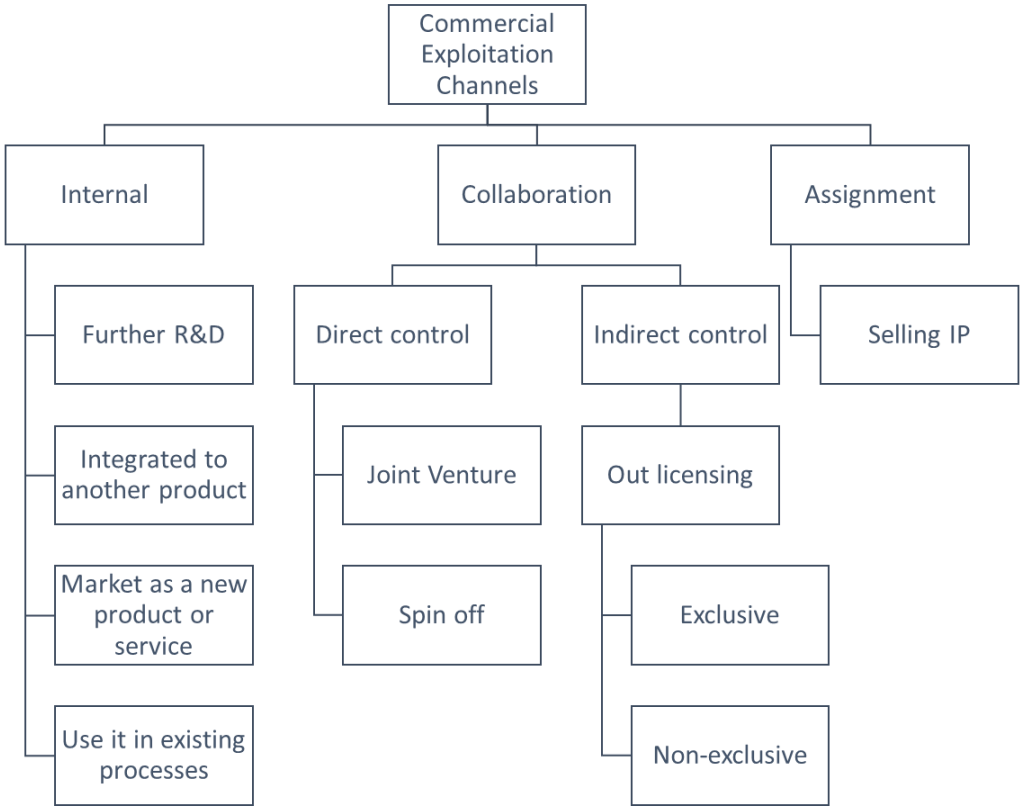

Figure 7: Different Commercial Exploitation Paths/Channels.

1. **Internal exploitation:** This strategy refers to use of results in-house (internally) by the creator for further research, integration into existing products, services, or processes, or marketing it as a new product/service.

   While using project results for further research is quite self-explanatory, integrating into existing products, services and processes means that project outputs are used to create a competitive advantage, either in the form of a cost cutting mechanism or by product differentiation. In case introducing a new product/service is the intention, a lot of effort and investment has to be put in marketing to make the commercialization a success. This strategy is mostly implemented when there is a fear of creating competition and losing critical information, or when the inventor does not have the capacity or is not willing to build/maintain relationships to enable other commercialization options.

2. **Collaboration:** There are different ways of exploiting project's outcomes in a collaborative manner. Join venture and spin-off is direct involvement and give more control over the exploitable results while out-licensing is an indirect way of commercializing and having control over the exploitable result. It is always advised to sign an NDA before engaging in any collaboration.

- **Joint Venture:** is a business alliance of at least two independent organizations to reach a certain goal together while sharing the risk and financial investment. This form of partnership is often chosen to gain access to a certain market, to gain expertise in the areas of R&D, manufacturing, marketing, and commercialization of technology, and/or to make use of untapped IP properties. Joint ventures may also be considered a good choice for organizations with financial constraints to allow them to develop new technologies and/or to market a product at a cost that would otherwise be unlikely, with a potentially faster expansion of the business.

  Usually, with a JV agreement an independent legal entity is created. Initial contributions (financial, IP background, etc.), responsibilities and obligations, as well as foreground exploitation and ownership should be decided in advance by partners. If new IPs are jointly formed, access rights to each other's IPs, as well as an acceptable management structure, termination rights and terms of entry for new partners should be agreed upon.

- **Spin-off:** A spin off is also a legal independent entity that can be established by 1 or more parent institutions. While a JV may or may not have the same business focus as the founding entities, a spin off most of the time has a different focus than the core business of parent institutions. A spin off can be established by;

  - Separation and hence direct contribution of financial, human and IP from the parent. In this case, normally the IP is transferred to the subsidiary.
  - An external agent such as a Venture Capitalist (VC). In this case, it is more common to transfer the IP through licensing to maintain some control over its exploitation.

- **Out-licensing:** It is a contract that gives permission of the use of IP to a licensee (someone interested in using the exploitable result) in exchange for a fee. It can be a standalone agreement or an integral part of a larger partnership. While negotiating the terms for the agreement, parties should agree upon the time and rights granted, scope of rights, license restrictions, territory/ geographical area for exploitation, remuneration and calculation of royalties (percentage or fixed fee, defining the income to which the royalty applies), reports and auditing of accounts, arbitration/sublicensing, representations/warranties, infringement, confidentiality, and termination.

  Licenses can be **exclusive** meaning that only the licensee can use it, **sole** meaning both licensee and licensor can use the IP, and **non-exclusive** meaning that the licensor has the right to license the IP to many licensees. Aside from an NDA, a Material Transfer Agreements (MTAs) might also need to be signed in some cases. Licensing as other collaborations come with benefits and risks for both licensee and licensor. European Commission's IPR Helpdesk lists the following benefits and risks of licensing to the licensee and licensor.

3. **Assignment:** It is a permanent transfer of IP rights to another party by selling it. The entity that transfers the ownership losses all its rights and responsibilities towards the IP. It should be highlighted that the **EC funded projects cannot be licensed exclusively or sold to a non-European third party or the partnership is against EU's interests.**

   Some reasons behind IP assignment might be:

   - Limited resources and capabilities (Finance, HR, marketing, etc.)
   - When the owner would like to have immediate access to cashflow
   - Not in line with the business setup
   - Non-core invention and lack of commercial exploitation.

4.4.2. Knowledge Exploitation channels

As explained above, commercialisation and knowledge transfer tools are not unidirectional and cannot be completely separated, as they often converge and operate in a complementary fashion. However, while commercialisation can be connected to the monetisation of public research, knowledge transfer is more disposed to the flow of knowledge from Partners to industry, with all the benefits related to social economic growth. Although licences and spin-offs are deemed to be the most important commercialisation channels, knowledge spill-over can be achieved also by student and faculty mobility, academic consulting, and research contracts. Student entrepreneurship is also gaining importance to promote the transfer of publicly funded knowledge. These knowledge transfer tools can be translated in public-private partnerships, thanks also to the increasing practice for industry to source external knowledge to widen their knowledge base.

To this purpose, industrial organisations are increasingly engaging into co-operative R&D alliances with RTOs to access their research, following the so-called open innovation process. In a few words, open innovation is intended as the use of internal and external technology sources to accelerate internal innovation and expand the markets for external use of innovation. In this sense, companies who cannot afford internal R&D are progressively relying on external knowledge and profit from outsourced technology, by acquiring or licensing innovation (under the form of patents) from other organisations. Beside the commercialisation tools, which undoubtedly are forms of knowledge spill-over, other knowledge transfer channels are recognised as crucial in stimulating innovation:

Conferencing and networking: Alongside publications, professional conferences, informal relations, casual contact, and conversations are among the channels ranked as most important by industry for the flow of knowledge between private and public sectors. As with publications, Partners should pay attention to the information disclosed in networking, as this could hamper further IP protection of the results generated. A more comprehensive analysis of the IP issue related to publishing can be found in the fact sheet “Patenting v. Publishing “, available in the library of the European IRP Helpdesk website. Additionally, ESRIUM partner should seek advice on the organisation responsible for IPR and Data management issues within the consortium and/or the governance structure created to manage innovation within the consortium.

Consortium agreements: Collaborations between industry and Partners may take several forms. When a public-private partnership for conducting a R&D project is created, the parties usually sign a so-called consortium agreement. This agreement aims to clarify the relationship among the project partners, including the obligations between them, the organisation of the work, the management of the project and the generated IP. This partnership enables companies to gain access to new knowledge and new business relationships by establishing cross-licences between partners to the intellectual property shared and developed within the project. IP-related issues that are to be addressed within consortium agreements include at least:

- Allocation of the ownership of intellectual property, which is generated in the framework of the project,
- Identification of the intellectual property which is possessed by the parties before starting the project and which is necessary for project implementation (i.e., background),
- Access rights to the above for project execution or exploitation purposes,
- The sharing of revenues.

Personnel mobility: The deployment and flow of publicly funded knowledge can also be fostered by student and faculty mobility between different science and technology sectors. Personnel exchanges and inter-sectoral mobility can certainly increase companies’ research productivity. This may be particularly beneficial to small enterprises as they seem more likely to use personal contracts to interact with university researchers. Students’ secondment and placement are also important for

knowledge spill-over and represent major motivations for companies to engage in private-public linkages, with in this case the main benefit for academia. This may occur through, for example, joint supervision of theses, internships, or collaborative research.

Standards: A standard is a document, established by consensus and approved by a recognised body, which provides for common rules, guidelines or characteristics for activities or their results and having the purpose of achieving an optimum degree of order in each context. Various standards along the innovation chain – such as terminology, measurement, testing, and interface standards – have been identified as knowledge transfer channels. Depending on the current research stage, the standardisation activities are initiated by the various stakeholders involved – i.e., researchers in Partners in defining the terminology, and industry in the later phases of the technology development.

Further Research: After the project is completed, it is intended that the public publications be made available as downloads on a dedicated website and through scientific search engines. Their long-term open availability assures that project results are easily accessible to other scientists and researchers, and that the project outcomes serve as the foundation for future top-level stream link research. To get the most out of the results, project partners can dig deeper into the subject and contribute to the research line, or as previously mentioned, engage in knowledge transfer activities. National and European funds are available to assist the continuation of successful project research lines by funding Ph.D. and postdoc positions.

Educational material: Universities can use the knowledge acquired from the project as course material for the existing programs and subjects or can develop new courses (e.g., specialized master classes, new subjects within existing programs) or educational programs (e.g., specialized master programs, summer/winter schools).

Social Work: Knowledge results can be used to bring positive changes to the society through engagement in volunteering activities and collaborations with non-profit organizations. Also, knowledge results can be used to raise awareness about specific topic or change the behaviour of the users for to reduce the negative impact of their activities on society and environment.

SECTION 5: GUIDELINES AND TOOLS FOR PREPARATION OF JOINT AND INDIVIDUAL EXPLOITATION PLANS

5.1. Guidelines for preparation of Joint and individual exploitation plans

5.1.1. Exploitation Strategy Guidelines: an overview.

As mentioned before, exploitation can be of commercial and non-commercial nature. As a prelude to each individual partner's exploitation strategy, we have compiled a list of general exploitation guidelines to assist ESRIUM partners when drafting such a plan. We divide these guidelines into the two main group categories present in the initiative: industrial partners and Academia and Research and Technology Organisations (RTOs). Moreover, we have provided partners with an exploitation template that can be used to draft individual/partner level exploitation plans.

<u>Guidelines</u>: Industrial Partners/for profit organisations

Some proposed strategies for industrial partners include:

- Consider developing new products and services from the project results. Explore the role of third parties in commercialization or find ways to commercialize them internally in a flexible and following a win-win approach.
- Develop prototypes and assess their commercial viability.
- Use ESRIUM results to improve existing processes within the company.

- Asses the possibility of creating a joint venture/spin off with consortium members or external parties to exploit the project results.
- Use the project results to generate new funding opportunities for the company.
- Explore further areas for research based on the finding of the project.
- Use company's engagement in ESRIUM as an opportunity to position the company, engage in new alliances, and expand the market.
- Look for and develop new business models.
- Take part in technology transfer activities (e.g., with academia)
- Use project result for standardization.
- If there are any current barriers or bottle nicks to the project's successful exploitation, address them as soon as possible.
- Leverage the experience of end-users in the consortium to develop, refine and build a solid and sustainable value proposition for ESRIUM findings that meets the demand requirements.
- Do not wait for the project to end, start immediate exploitation.

Guidelines: Academic and Research Partners

Some proposed strategies for academic and research partners include:

- Offer seminars, lectures, course about the topics related to the project. Let the results of the project influence and/or improve education and training.
- Engage in non-commercial exploitation of results through academic publication Ph. D thesis and master thesis. Engage in enhanced project-based dissemination practices to present work in conferences (industrial and academic), journals, etc to increase the impact of the project results.
- Use ESRIUM results to build upon new research projects and engage in new funding opportunities.
- Engage in advising and policy consulting.
- Open new post-doc or Ph.D. positions
- Asses the possibility of establishing a spin-off or engaging in a joint venture.
- Encourage your staff to entrepreneur based on R&D findings
- Engage in technology transfer activities (e.g., licensing)
- Use the project outcomes as a tool to augment the organization's reputation, broader outreach and attract new students and further research endeavours.
- Leverage the nature of ESRIUM partnership to establish public-private alliances to attract further funding and continue joint R&D activities.
- Use the project outcomes as a tool to augment the organization's reputation, broader outreach and attract new students and further research endeavours.

Additionally, **transversal recommendations** apply to **ALL ESRIUM partners:**

- Identify the organization's contributions to the project.
- Do not forget about IPR, but make sure that your contribution is accessible.
- Consider protecting intellectual property, for example, through patents. If not, make the results of the work available as open source/Copyleft license or take into consideration the transfer of IP rights to a third party that is interested in exploiting the results.
- Evaluate the applicability of project results at local and national level.
- Early in the process, involve marketing, operations, finance, and sales divisions of the company to spot commercial opportunities.
- Identify consumer needs that are met by the ESRIUM solution and product.
- Determine what factors are critical for an effective exploitation and how they can be honed and improved.

- Make sure that policy recommendations are followed and required actions are taken.
- Identify gaps in academia or market that can be solves by ESRIUM results.
- Trigger interest in the industry for your project results
- Provide innovation in project results, ensure there are advantages compared to competitors.
- If there are any current barriers or bottle nicks to the project's successful exploitation, address them as soon as possible.
- Do not wait for the project to end, start immediate exploitation.
- Create an exploitation timeline, demonstrating how the exploitation can be arranged in stages.
- Develop financial projections and determine the capital needed to exploit the results.

5.1.2. Available tools to support exploitation of R&D results

Following the guidelines for preparation of exploitation plans from the previous chapter, this subchapter lists and reviews **valuable tools** that are available to all beneficiaries of EU funded projects, most of them free of charge, that can **help better use the potential of the results** and outcomes of their projects, and to **successfully exploit them**. The most useful tools are:

- **European IP Helpdesk** – A free of charge service developed by European Commission, to serve as a support to help European SMEs, as well as all beneficiaries of EU-funded projects to successfully manage their IP. The Helpdesk offer broad range of informative materials, as well as direct IP Support through Helpline service, and training programmes, both online and on-site. [9]
- **Innovation Radar** - A data-driven method focused on the identification of high potential innovations and the key innovators behind them in EU-funded Research and Innovation projects. Its goal is to ¨ allow every citizen, public official, professional and businessperson to discover the outputs of EU innovation funding ¨ [10]
- **Horizon Results Booster -** A service free of charge in case you would like to apply to benefit from one of these services: 1. Portfolio Dissemination & Exploitation Strategy 2. Business plan development 3. Go-to-Market Support [11]
- **Horizon Results Platform -** A public platform that hosts and promotes research results thereby widening exploitation opportunities. It serves as a repository of the Key Exploitable Results of EU funded projects and aims at promoting those results. Any beneficiary of EU funded project can use this platform, it is meant for policymakers, investors, an entrepreneur, researchers, experts in innovation, legal, business development or financing, or any interested citizens or citizen groups [12]
- **Invest EU –** A platform created with the main goal of attracting investors to projects. It serves as the database granting visibility to EU-based projects. On this platform the projects can be shared and presented to investors with the aim of achieving additional external funding. The publication of the projects is free of charge. [13]

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