Novel Strategies to Fight Child Sexual Exploitation and Human Trafficking Crimes and Protect their Victims

H2020 – 101021801

www.heroes-fct.eu

D10.20 Exploitation Plan – V3

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Abstract (for dissemination)
This deliverable presents the description of the selected key exploitable results as well as the exploitation strategy for each KER, the partners involved, the exploitation schedule and the management of intellectual property rights.

Keywords	Exploitation plan, exploitation strategy, exploitation calendar

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1.0	15/01/2024	Luis Javier García Villalba (UCM)	Final Version

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Executive summary

This deliverable highlights the exploitation strategy of the HEROES project, focusing on the identification and prioritization of Key Exploitable Results (KERs). A thorough analysis of partner contributions has been carried out, prioritizing results according to their impact, contribution to objectives and technical feasibility. Exploitation planning has been refined, detailing adoption strategies, effective communication channels and the definition of key messages for each KER. The exploitation calendar provides a detailed view of the actions scheduled to be taken by each partner to meet their exploitation objective. In addition, Intellectual Property Rights (IPR) management has been added to ensure effective protection and maximize the value associated with the KERs.

Abbreviations

AB	Advisory Board
API	Application Programming Interface
CA	Consortium Agreement
CSA/CSE	Child Sexual Abuse/ Child Sexual Exploitation
DoA	Description of the Action, Annex 1 of the Grant Agreement
EC	European Commission
LEAs	Law Enforcement Authorities
IMA	Instant Messaging Application
IPFS	InterPlanetary File System
NER	Named Entity Recognition
NGO	Non-Governmental Organization
OSINT	Open Source Intelligence
THB	Trafficking in Human Beings
TRL	Technology Readiness Level
WP	Work Package
IPR	Intellectual Property Rights

1. Introduction

Deliverable D10.20 aims to ensure future viability, planning, evaluation and strict control of the most important aspects of the project. Moreover, it aims, to ensure the self-sustainability of the outcomes of HEROES, with the generation of scalable strategies. Another objective is to explore other niche markets, while considering the commitment of the consortium with IPRs and knowledge sharing – open-source solutions, public deliverables, open publications and reports dealing with recommendations, access to research data, etc. Common guidelines will be defined at the beginning, paying attention to end-user needs and the marketplace while being coherent with the strategy, interests, and rights of the involved partners – the Project Coordinator will collaborate with the consortium contacts, technology transfer offices and public relations departments of the partners. All these aspects will be reflected in the exploitation plan (D10.9), which will be periodically updated (from M06 to M36 in D10.19, D10.20 and D10.21) to incorporate the latest changes and advances in the state-of-the-art, trends and competitors among others.

2. Exploitable outputs and partners' exploitation

2.1. Key concepts

Exploitable outputs for the HEROES project comprise the potential exploitation of non-commercial and commercial oriented results.

- Non-commercial oriented results include the technological and methodological solutions created by HEROES. It will be oriented to knowledge transfer, policymaking and training activities towards the scientific community, LEAs, Multi-Stakeholders. and especially society to address THB and CSA/CSE crimes. Much of the knowledge will be transferred through training, conferences and periodic publications or briefings.
- Commercial-oriented results are solutions aimed at reaching the market in the short/medium term depending on the corresponding TRL. These results will feed the current product and service portfolio of the consortium partners. Others will be analyses in depth by the NGOs to choose the most appropriate exploitable action (e.g., licenses, partnerships, spin-offs, etc.).

HEROES will emphasize turning technological developments and research outcomes into value-creating products and services. The modularity of the proposed solution will allow partners to assess complementary strategies based on the flexibility of the results to be used in other systems and sectors. Figure 9 shows the TRL and SRL (actual and final) of each component of HEROES.

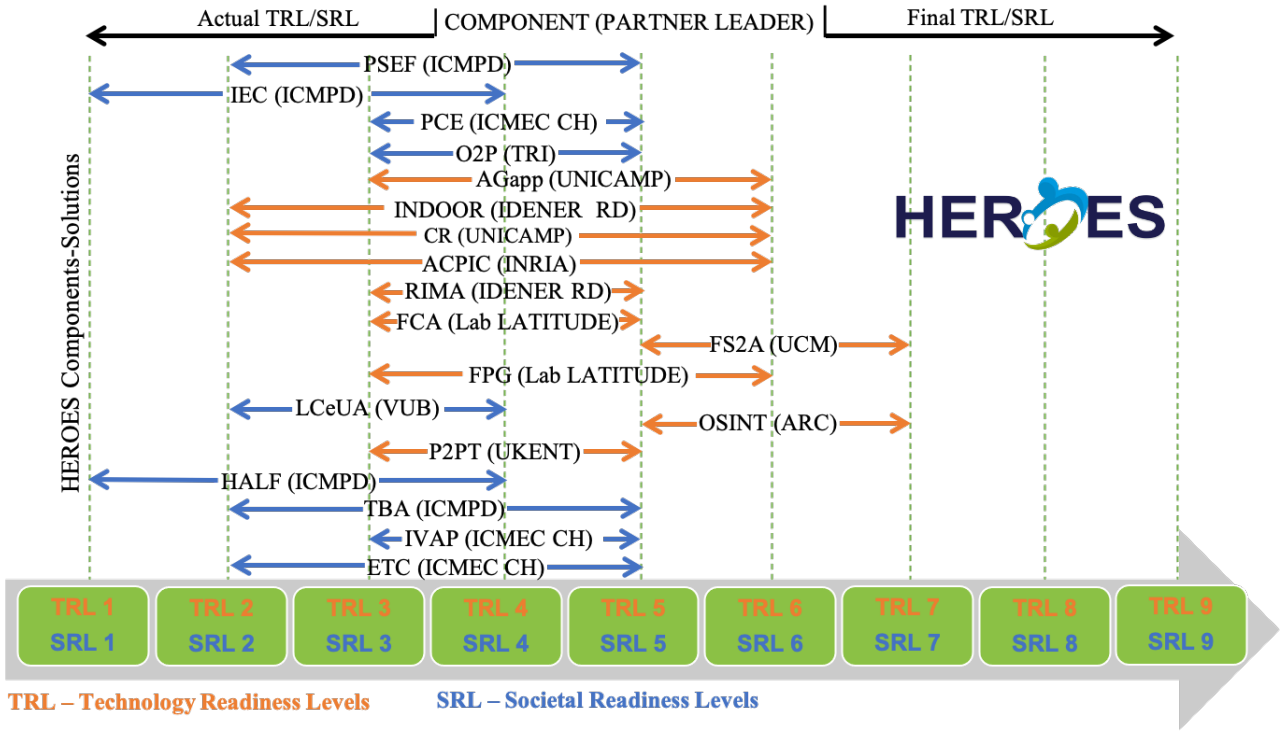

Figure 1. Actual and final TRL/SRL of the components to be developed in HEROES.

2.2. Roadmap

The Exploitation will be divided into a several phases:

- **Planning phase (M6 – M12)**: First Exploitation deliverable (overview of exploitation strategies).
- **Awareness raising phase (M13 – M24)**: Progressing and tracking exploitation activity.

- **Preliminary results and ongoing activity (M25 - M36)**: Analysis and assessment of impact and success of exploitation activities against key performance indicators, further refinement of exploitation strategies.
- **Final results and exploitation (M30 – M36):** Extensive public disclosure of final project results and outputs, analysis and assessment of impact and success of exploitation activities against key performance indicators, development of final exploitation plan.
- **Post-project phase (2 years post project):** Analysis and assessment of impact and success of exploitation activity, further engagement with another European programme to identify best practices to disseminate and exploit widely the added value of assets generated after the programme.

The more promising strategies will be updated and refined during the project, guaranteeing the compliance with the described guidelines and foreseeing a realistic approach as a complement to joint exploitation strategies and the possible business models outlined in the following sections.

3. Market analysis

The increasing crime rates and the sophistication of crimes across the world have further emphasized interest in developing advanced technology and intelligence as a solution to solve crimes. In fact, the growing interest in improving technological strategies has been one of the primary factors in forensic technologies' market growth. Forensic technologies are vital in criminal investigations, as rising numbers of criminal cases increase the backlog of pending cases. During the last few decades, THB, especially when involving sex trafficking, has grown dramatically with the introduction of new technologies THB includes a variety of forms of exploitation such as CSA. [1] A model applied in the UK identified important limitations about the gathering of data and processing of cases. Nevertheless, it is very important to build a solution that can include an evidence-informed approach of the victims. It is argued that technologies may be employed at each phase of the trafficking process. Additionally, a limited budget of LEAs avoids a better approach to mitigate this kind of threat [2]. Technology should improve our comprehension of how people find themselves in exploitative conditions. It is necessary to investigate how technological advancements can guide us with the difficulties of THB practices. Moreover, LEAs need to know if their interventions against counter-trafficking impact the victims [3].

Everyday LEAs makes use of several tools that help mitigate the THB and distribution of CSAM/CSEM. For the side of THB is possible to find tools designed for non-profits, companies, or government and law enforcement agencies. These tools are divided into several types such as Image Recognition, Awareness, Reporting, Data Management, and AI [4]. In [5], the European Commission carried out the evaluation of 10 commercial tools for fighting against CSA, demonstrating that there is no an integral comprehensive tool that solves this problem as a whole, and each tool provide different specific functionalities (Face detection/age estimation/context analysis among others). In addition, some tools are dependent on others, which could imply a significantly high additional license cost [6], [7], [8], [9], [10], [11], [12], [13]. Moreover, the use of all tools functionalities strongly depends on the specific legislation of each country [14], [15]. Although free tools are widely available, integrated missing.

Projects with such an impact should be globally supported by government and academic organisations, in collaboration with United Nations Agencies [16] (external expert advisor of this consortium) and child rights NGOs to be effective in the formulation of international plans of action. Therefore, it is necessary to have an integrated platform that addresses the problem as a whole at global scale and complies with current legislations. This solution should be in accordance with the short/medium/long term impacts of the international plans of action in the context of Trafficking of Human Beings and Child Sexual Abuse investigations. In this context, a broad market of technological innovation for the entire consortium will be developed, especially for LEAs and organisations that deal with this type of crime. The technological innovation market will be expanded as the implementation of high-tech methods, techniques, resources, and methodologies are developed and deployed in HEROES solution. Big-data technology will increase research capabilities, creating more opportunities to evolve and expand niche markets. According to [17], the European Parliament forecasts annual growth of 236% in data generation and 1.9% PBI growth by 2020. There are also alternatives at European level such as the European Network of Centres of Excellence in Big data which promotes cooperation between leading centers in Big data, Universities, and LEAs. Finally, OSINT tools have revolutionized the data collection market, and are currently used in all security organisations worldwide [18]. These experiences acquired by LEAs are vital to create a safe technological environment open to the international opportunities that the market demands.

4. Business model

The HEROES business model will make it possible to clearly define what the consortium wants to offer to clients (LEAs, Multi-Stakeholders and Society), how the work will be carried out and how to generate commercial opportunities. Figure 2 shows the initial business model of HEROES. For this, they use the canvas business methodology that will help HEROES to be a successful project. However, during the first months of the project, it will be improved by using other methodologies such as Lean Start-up and Disciplined Entrepreneurship. The combination of methodologies in HEROES will allow us to accurately estimate cost aspects of the services, the positioning of our product and the relationship with other open-source tools. Sustainability is evolving, and so is our model. The HEROES solution aims to promote social leadership for a sustainable future. Therefore, they will update our working model while maintaining our commitment: the integrated and responsible management of sustainability. HEROES will adopt sustainability strategies from recognised companies that develop tools for forensic analysis, cybersecurity and cyber defense (Microsoft, Griffeye, Opentext) and organisations that establish strategies to combat emerging threats (United Nations, organisation of American States, Non-governmental organisations).

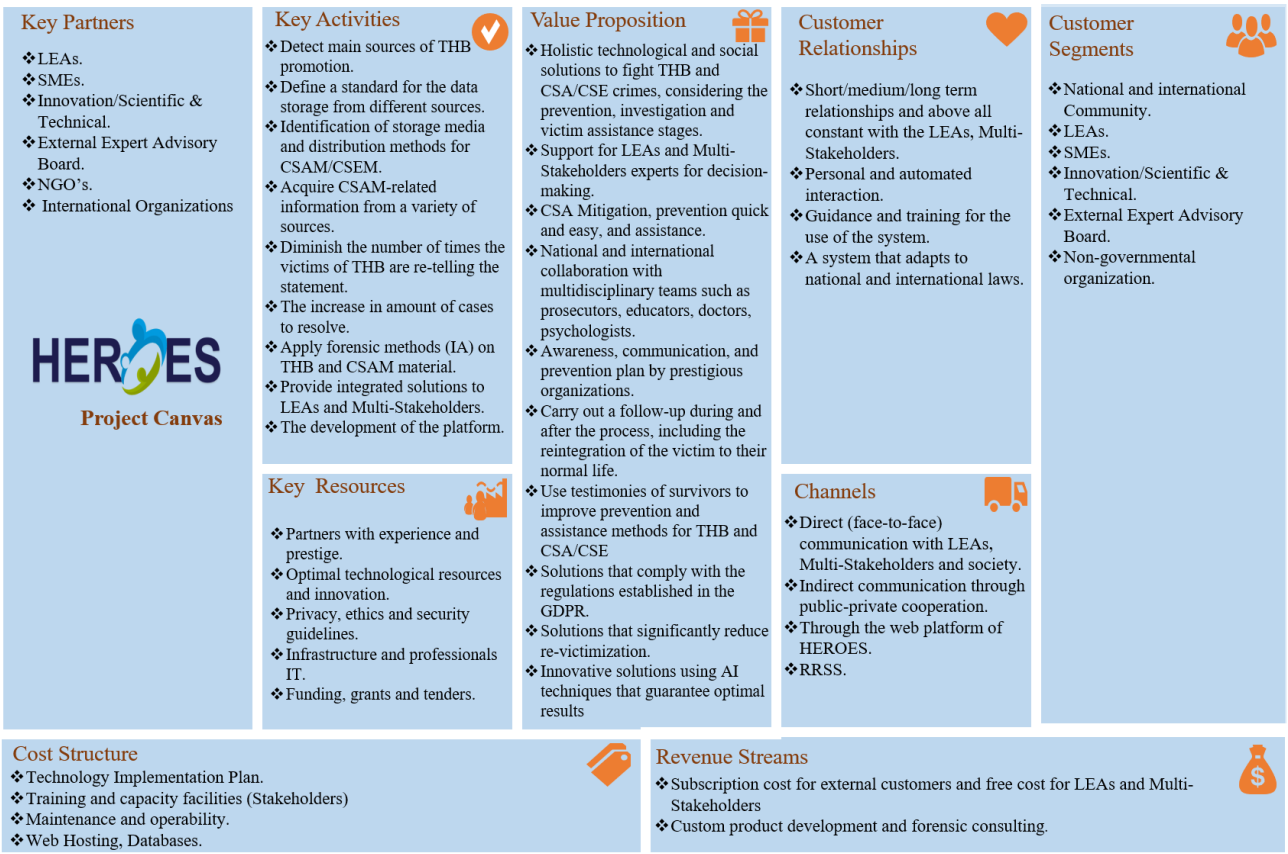

Figure 2. HEROES model canvas

5. Exploitation activities

5.1. Outputs of the project:

The HEROES project is structured as a comprehensive solution that encompasses three main components: Prevention, Investigation and Victim Assistance. Through these components, our solution aims to establish a coordinated contribution with LEAs by developing an appropriate, victim-centred approach that is capable of addressing specific needs and providing protection.

The Heroes project can therefore be divided into different modules:

- **Prevention Approach**: Regarding the proposed solutions to improve the fight against THB and CSA/CSE, the HEROES project presents different strategies that when combined can meet the objectives of (i) reducing the risk of being a victim of any form of trafficking in human beings and child sexual abuse, (ii) to increase citizen awareness and (iii) to increase and to facilitate citizen collaboration with LEAs and organisations involved in the fight against THB and CSA/CSE crimes, including victim support organisations.
- **Crime Investigation Approach**: Criminals use technologies such as social media, P2P networks, and the dark web to carry out their criminal activities to attract and exploit vulnerable people. Within the framework of the HEROES project, various tools are proposed that will help in the fight against THB and CSA/CSE, in order to catch and prosecute criminals and protect these vulnerable people.
- **Victim Assistance Approach**: As to the proposed solutions to improve victims' assistance regarding victims of THB and CSE/CSA, HEROES project will develop preventive measures to ensure adequate protection and assistance for these victims, by means of implementing training programs to LEA and multi-stakeholders practitioners, developing policies and strategies to policy and lawmakers to advance the rights of THB and CSA/CSE victims and developing a good practices book and guidelines for LEA and multi-stakeholders procedures concerning victims of THB and CSA/CSE.

5.1.1. Prevention Approach

5.1.1.1. Psychological, Social and Economic Factors that influence THB and CSA/CSE crimes (PSEF):

For early THB identification, the HEROES approach will make use of the existing research on determinants of trafficking, as well as the existing work in the anti-trafficking community on THB indicators. The innovation of the HEROES approach consists in critically analysing the understanding and operationalisation of "classical" factors determining trafficking (political, social, psychological and economic factors) and making use of results of the latest research on trafficking and CSA/CSE. Based on existing research on early identification of crime, HEROES will develop a series of studies to develop tailored methodologies/tools for early identification of THB and CSA/CSE.

The key exploitable results of this toolkit are:

- **Manual for early identification of potential victims of THB and of CSA/CSE:**

  The Manual will present a general overview of THB and/or CSA/E in the countries under study and sector-specific indicators to spot those crimes in each country. THB and CSA/E may overlap or happen simultaneously in many cases. The contexts and indicators of these phenomena are likely to be complimentary at best and supplementary at least, allowing for cross-identification.

5.1.1.2. Prevention Campaigns and Education (PCE):

HEROES will develop prevention and education plans aimed not only at the general public but also at groups identified as being at risk. In this sense, the collaboration with the organisations participating in our consortium will be direct, because each of these organisations is aware of the reality of their workplaces and therefore the focus that should have each of the campaigns to be carried out. HEROES project will develop a detailed description of training to be taught during prevention and awareness campaigns carried out for the duration of the project.

The key exploitable results of this toolkit are:

- **Enhanced training curricula on recognizing, intervening, and preventing various forms of sexual violence**

  The purpose of this task is to create specific learning methodologies, training curricula and materials to respond to the needs of relevant stakeholders in specific countries, selected based on the number of CSAM reports generated by NCMEC and other ICMEC CH partners. The aim of the training curricula is to strengthen the response capacities of the relevant authorities and to contribute to sustainable training capabilities through ToT manuals.

5.1.1.3. Anti-grooming Mobile App (AGapp):

HEROES propose the development of an Anti-grooming mobile App to automatically identify and block the sending or receiving of inappropriate content over IMA and OSN. The AGapp tool will be installed on the children's mobile devices by their parents and will be the "firewall" to avoid grooming. HEROES, to develop the AGapp tool, will use a secure Federated Learning approach to build machine-learning models based on datasets that are distributed across multiple devices while preventing data leakage and overall, in accordance with the EU GDPR.

5.1.1.4. Identifying Fake Job Offers (INDOOR):

HEROES project proposes the development of an application that through the use of OSINT and AI algorithms, will be able to identify possible fraudulent job offers. The tool will be similar to an anti-phishing system. INDOOR will use the information published in the offer (company name, web address and business mail, contact phone, etc.). Through this information and with the use of the OSINT tools, the system will look for information related to the veracity of the introduced data. Once processed and contrasted, the result is stored so that in future searches with similar input data, the response will be faster and more acurate.

5.1.1.5. Citizen Reporting App (CR):

The tool proposed by HEROES will be focused on the recognition and reporting of THB and CSA crimes. The application will provide a simple and interactive explanation that will introduce the user to collaborate with the police, identifying possible cases of child trafficking and sexual exploitation. The application will be developed, considering all the languages of the member states. In addition, all reported complaints will be communicated to local authorities to be attended, but also serve to identify possible hot spots of illegal activity, for this, the application will have geolocation and image capture functionality if necessary.

5.1.2. Crime Investigation Approach

The key exploitable results of this toolkit are:

5.1.2.1. Automatic CSAM/CSEM Identification and Classification Tool (ACPIC):

HEROES propose the development of a tool specialised in the automatic detection and classification of CSA/CSE material. To achieve this objective, HEROES will develop artificial intelligence models that are capable of estimating age and identifying the context of the content not only considering nudity as a determining factor for sensitive material and possible CSA/CSE content. Therefore, the development of algorithms based on Convolutional Neural Networks (CNN) for gender estimation and based on DeepUAge for estimating age will be carried out. Likewise, the algorithms for the automatic classification of CSA/CSE material supported by object and background recognition models. These automated capabilities will help LEAs spend less time processing and examining evidence and will lead to more accurate identification results.

5.1.2.2. Profile/Content Generator (PCG)

The main idea is to propose the core mechanisms and requirements of a cyber investigation tool that is able to verify the digital traces to help investigators to be able to find clues and evidence regarding a particular case, suspect or context related to a particular subject. The HEROES PCG tool will at least have the following modules: A module for authentication and control access of the functionalities of the tool. A module for inserting information regarding the profiles that are to be managed on the behalf of the investigator and the corresponding platforms of interest for each case or investigation. A module for the investigation workflow where a target is to be defined and what sources of information is to be used. A module to provide acquisition of the data based on bots or crawlers' units to take as input the source of information – API or URL – and to be able to mine such sources of information and retrieve the relevant content of it. A module to aggregate and correlate data of the interest of the investigation. A module for data visualization and model generation based on the content and entities of interest of the investigation. A module for reporting according to the investigators needs so he can explain the case, its main aspects and the entities related to the investigation. At last, a module to control and update information regarding the profiles used by the investigators and the activities the investigators have performed regarding such profiles and the corresponding investigations.

5.1.2.3. Open-Source Intelligence Tools (OSINT):

The Open Source Intelligence (OSINT) refers to the intelligence gathering of intelligence of public information from publicly available sources, such as Media, Web-based communities like forums, wikis or social networks and public data like reports, press conferences or academic papers. This process is not always easy and requires technical skills such as knowledge of search engine operators for filtering the results of the search, knowledge of specific Websites and Search Engines and their APIs, hands-on experience with web scraping in order to extract the data from websites which do not have API and experience with OSINT tools in order to do not reinvent the wheel and to adapt these tools to the needs of the project. HEROES will provide the LEAs with a set of tools to extract data from the surface web, the Deep Web and the Dark-net related to THB and CSA/CSE crimes

5.1.2.4. Real-time Instant Messaging Application Content Acquisition (RIMA)

Heroes will research the feasibility of tracing illegal activity in IMAs, and then, automated tools to store relevant data will be developed. The research will be focused to the analysis of secure IMAs, such as WhatsApp, Telegram, etc. to determine whether the underlying APIs and/or use of cryptographic primitives contain vulnerabilities that can be used to exfiltrate information and digital evidence regarding THB and CSA/CSE.

5.1.2.5. P2P CSAM/CSEM Identification Tool (P2PT)

HEROES will develop a modular tool in which the main component (base tool) will use the features shared and defined by the most popular p2p networks (e.g., hashes, file names, etc.). On this basis, the development

of specific plugins to address each of the networks and their characteristics will be performed. This tool would also allow studying activity patterns of offenders who transmit and/or share CSAM. This will allow us to identify those IPs that are more active and share the most material, therefore, possible content creators. Also, during the development of the HEROES project, they will carry out an analysis of the feasibility of the identification of CSAM/CSEM streaming content to enhance the investigation capabilities of the EU LEAs.

5.1.2.6. File Context Analysis from Seized Devices (FCA)

HEROES will implement algorithms based on Natural Language Processing (NLP), also called Topic Modeling and NER, which will allow to obtain precise search results based on the content of those documents. These algorithms are based on the clustering words of a document and subsequently defining that cluster, depending on its composition, with one or more themes or topics. Thanks to this, they will be able to identify documents that have one or several types of content all and that do not refer to it explicitly. Furthermore, it will be possible to incorporate tailored word dictionaries, developed within the help of the local LEAs, to make the topic-modelling based tool more accurate based on the language and particular context of each country where it is used.

5.1.3. Victim Assistance Approach

5.1.3.1. Integral Victim Assistance Program (IVAP):

The development of a Comprehensive Victim Assistance Programme in the framework of Multidisciplinary Victim Assistance strategies to avoid re-victimisation of victims (WP7) has a twofold objective, on the one hand, to cover both the victim assistance perspective and the success of investigations, on the other hand, the perspective of victim assistance and the success of investigations, on the other hand, will prove to be effective in preventing, ending victimisation and avoiding secondary victimisation. To this end, the HEROES project will study and propose guidelines and protocols for the identification of the traumatic link in victims, followed by recommendations; the rights of victims and their particular needs, and an appropriate training and intervention plan for health care workers and other health care workers and other professionals who health workers and other professionals caring for children, also in the perspective of a victim-centred approach.

Local authorities and other professionals in contact with victims of CSA/CSA and THB should be aware of the fundamental rights of victims and be sensitive to their needs of victims.

The key exploitable results of this toolkit are:

- **Best practices guidelines for trauma bonding identification protocol:**

  The goal of this task is to develop a protocol to identify signals of trauma on THB and CSA/CSE victims. This protocol will allow, to the government officials, NGOs and service providers, recognizing when the survivor has experienced trauma bonding. In addition, this recognition will improve the victim's assistance program by making recommendations for the development of specialised programmes that address the psychosocial impact of the CSE/CSA and THB experience that will increase a victim's ability to break the trauma bond.

- **Guidelines for awareness and victims' assistance resources addressing governments and stakeholders to follow on investigation and prosecution:**

  Carry out protocols for the care of THB and CSA/CSE victims, with a focus on prevention, investigation and prosecution, focused on the victim, thereby achieving non-revictimisation, and proper intervention of actors and proper use of resources for proper criminal prosecution.

5.2. Exploitation Plans per partner

UCM prepared a questionnaire that was circulated to all partners. They analyse herein the responses sent by all partners taking into account their nature (Technological partners, NGOs, LEAs, universities focusing on Social Sciences and Humanities, etc).

The preliminary vision of each partner's individual exploitation plans (to be updated and refined during the execution).

Organisation Type (Partner) | Exploitation interests and strategy:

- **UNIVERSITIES (UCM, UNIKENT, VUB):** The results of the research activities of HEROES are novel enough to ensure a strong scientific impact, disseminating the research results with publications on high level conferences and impact journals. Much of the topics tackled in HEROES will be considered as topics for master and PhD. thesis offering to students work in innovative research problems with practical impact.

  UNIKENT expect to make an impact in crime reporting, digital forensics, digital forensics readiness, child safety. The needs that could be solved by the results would be:

  - Faster and more effective child protection, in cases of identified CSA/CSE and THB by citizens
  - Faster reporting to LEAs with the respective evidence
  - Improvement of the identification of CSA/CSE material within P2P networks
  - Better understanding of child protection and the needs that it has

  Also, UNIKENT outputs will be:

  - CSA/CSE and THB report application and webpage
  - P2P CSA/CSE identification tool
  - Adoption of novel technological paradigms, such as image similarity using perceptual hashes

  Improvements over other tools, UNIKENT expects to have more accurate results, tools developed based on novel technological paradigms and citizens involvement. The results will be available to Europol (for testing purposes), citizens (reporting application), LEAs (for testing, use and maintenance purposes), NGOs and stakeholders. In addition, UNIKENT expects to use the results in the following fields:

  - Cyber Security- Digital forensics(readiness)
  - Crime report
  - Children Safety
  - Smart Cities

  UNIKENT outlines the main advantages of the new solution(s) it expects:

  - Safer Internet, especially for children under the supervision of parents and specialists
  - Visibility of CSA/CSE and THB cases and the danger for children and potential THB victims
  - Educational sessions for children, parents, LEAs, tutors, citizens, etc.
  - Novel technological paradigms for fighting CSA/CSE and THB, available to LEAs and citizens. In terms of what the results will look like, they will include direct results (such as a manual, a test, a model, a new therapy, a better product or process, or a better understanding of mechanisms) and indirect ones (such as reduced use of materials or energy, improved safety, or improved staff training)

UNIKENT identifies the following elements as direct:

- Citizens report to LEAs, test of the application
- Improved version of existing tools, such as iCOP and RoundUp

After completion of the research and innovation, UNIKENT proposes the following examples of how to apply the obtained results and practice:

- Standards and the chain of custody to be agreed on
- Testing
- Financial support
- Creation of training sessions for the users

Regarding the estimated time for commercialisation of the results, the aim is currently not to commercialise the research results, but to develop tools to facilitate LEAs.

Potentially, the results could be commercialised and made available to countries outside the EU, promoted by European LEAs.

Finally, UNIKENT expected the following TRLs:

- Task 5.1: TRL 2-6
- Task 8.4: TRL 3-5.

Additionally, **VUB** will expand its expertise, while also getting its legal research closer to a multi-disciplinary and cross-sector consortium.

The results of their tasks will ensure the legal and ethical feasibility of some of the sensitive technologies developed within the HEROES Project and improve the development of tools to assist the multidisciplinary response of the rehabilitation of offenders and THB victims.

VUB expect to make an impact in academic field. Also, VUB outputs will be:

VUB will intently turn the deliverables into articles published in peer review journals. VUB will also disseminate the findings of the deliverables in conferences.

In addition, the outcomes of the deliverables would also be the starting point for a PhD of an FRC member.

The results will serve as a basis for the technologies and protocols being developed in the framework of the HEROES project. In particular, T4.2 and T4.7 will help the HEROES Consortium to comply with the relevant legal and ethical framework enhaced covert research, especially when developing the Profile/Content Generator in WP6. In the case of T.5.3, the initial element of this study would be to understand the experiences of convicted perpetrators of human trafficking with their crimes and to identify the best measures to rehabilitate them. Finally, T7.1 will serve as the basis for the development of cross-sectoral protocols, guidelines and training plans aimed at identifying and addressing signs of trauma, while avoiding any risk of re-victimisation in Work Package 7.

The outputs of the project would be made available on PURE, a research portal used by VUB which provides all ongoing and completed research projects and contains biographical information on our researchers and their teams. The portal also functions as an institutional repository where you can quickly find a wide range of open-access publications.

Many potential users would benefit from their results including scholars, AI developers, and NGOs working in the field of THB.

The main obstacles to the implementation of any of its results are shown in Table 1 below:

Regarding the estimated time for commercialisation of the results, the aim is currently not to commercialise the research results, but to develop tools to facilitate the work of LEAs.

Table 1: Tackle the barriers for apply the results (Universities)

Barriers	Solution
Inadequate financing	- Seek for collaboration with third party companies - Financing covered by other projects
Skills shortages	- Collaboration with other staff members - VUB network
Regulation that hinders innovation	- Comply with current regulation
Intellectual property right issues	- Results are owned by the beneficiary that generates them (grant agreement)
Traditional value chains that are less keen to innovate	- Creation of existing tools but more innovative
Incompatibility between parts of systems (lack of standards)	- Employment of particular standards from the beginning of the project
Mismatch between market needs and the solution.	- Their results will comply with the needs of LEAs and the Project.

- **RESEARCH INSTITUTES (INRIA, KEMEA, ARC):** INRIA can provide state-of-the-art robust algorithms for accurate analysis of human behaviour from video data. The face analysis group can deliver accurate algorithms and tools to estimate emotion, gender and age, and object recognition. The focus of INRIA will be to advance the state-of-the-art in Deep Learning in these areas. KEMEA as the think tank of the Hellenic Ministry of Citizen Protection regarding security policies, R&D and innovation actions will bring the HEROES project's outcomes to the attention of the Ministry and to the associated entities. KEMEA will use the project's findings to enhance its consulting and research services and portfolio.

  KEMEA expects to make an impact added value towards all axes of prevention, investigation and victim assistance and generally a tool able to enhance the battle against the aforementioned crimes for all actors involved in the process.

  The needs that could be solved by the results would be:

  - All end user requirements (D.2.3.) are being recorded and taken into account by technical partners, so that the outcome fits the needs of the end users. Moreover, transnational legal differences will be spotted and compromised to a certain extend, while also good and bad practises towards victims' treatment will be of significant importance in order for them to be treated the best way possible.

  Kemea contributes mainly on WP2 regarding best-practices specifications, requirements and use cases definition, while also supports tasks regarding pilots on use case preparations.

  In terms of improvements compared to other tools, KEMEA it involves tools that are innovative and others that are complementary to already existing tools. It involves a large scale of stakeholders starting from citizens up to the prosecution phase. By certain tools and according to their integration into national contexts court admissible evidence can be at times be created while also time-efficiency regarding investigation is a key component of the whole toolkit.

  KEMEA identifies the following elements as direct:

  - Citizens
  - NGO's

- LEAs

In addition, KEMEA expects to use the results in the governmental entities to help raise awareness of the public by incorporating online modules that involve citizens in reporting of the aforementioned crimes.

After completion of the research and innovation, KEMEA proposes the following examples of how to apply the obtained results and practice: incorporation in national legal frameworks, further financing, promotion to policy-making stakeholders, training.

ARC will further extend the results obtained from LOCARD and push further innovations in the direction of detection and prevention of online deviant behaviour and expect to make an impact in Cyber threat intelligence.

The needs that could be solved by the results would be:

- Monitoring of less supervised online services.

Also, ARC outputs will be:

- New OSINT feeds.

In terms of improvements compared to other tools, ARC identified the next items:

- Correlation with other sources,
- Monitoring of platforms which are not currently under the radar, e.g. IPFS.

The results will be available to LEAs (for testing, use and maintenance purposes) and threat intelligence companies.

ARC outlines the main advantages of the new solution(s) it expects:

- By monitoring IPFS one would be able to determine which IP initially uploaded CSAM or other illegal content (e.g. IP infringement in the case of movies), malicious content (e.g. malicious payloads) and who is currently serving/storing this content.

After completion of the research and innovation, ARC tools are expected to have a TRL up to 6. While in terms of functionality they are expected to be fully working and operational, collecting the data and scaling them requires additional effort which is more applied and industry oriented, to e.g. host it on the cloud and make the proper scaling adjustments.

The main obstacles to the implementation of any of its results are shown in Table 2.

Table 2: Tackle the barriers for apply the results (Research Institutes)

Barriers	Solution
Inadequate financing	- Chances for further eu financing can be exploited. - Approach EACTDA for post financing of the tools, discuss with venture capitals
Skills shortages	- Trainings should be designed - Hire proper people from the industry.
Regulation that hinders innovation	Proposal can be drafted to stakeholders
Intellectual property right issues	N/A
Traditional value chains that are less keen to innovate	Awareness campaigns
Incompatibility between parts of systems (lack of standards)	N/A
Mismatch between market needs and the solution.	Discuss further with end users

- **INTERNATIONAL ORGANISATIONS (ICMPD): ICMPD** will contribute to HEROES activities from a social science perspective. Both the Research Unit and the Anti-Trafficking Programme will lend their expertise. ICMPD will draw from its internationally tested methodologies to generate evidence-based knowledge, as well as policy tools, to improve LEAs' criminal response and feed their systems with accurate parameters. ICMPD will also contribute to capacity building activities, producing curricula, plans, methodologies, and assisting the application of such tools during pilot training. For ICMPD, the impact of their work would be in the academic and scientific community, on the one hand, and the policy and practitioner community, on the other. This includes knowledge transfer, policymaking and training activities towards the scientific community, LEAs, Multi-Stakeholders and especially society to address THB and CSA/CSE crimes. Much of the knowledge will be transferred through training, academic and policy conferences and scientific publications.

  The needs met based on their tasks would be better understanding of and tools for response to online cases of trafficking in human beings in particular, among the scientific and practitioner/policy community.

  In addition to the public Deliverable 4.4, ICMPD will also produce academic outputs related to the research conducted under WP4. In addition, ICMPD will contribute to the training plans for anti-trafficking stakeholders, developed under the project.

  Improvements over other tools, ICMPD's training materials link up to and make use of other training material produced in this field. Thus, the training materials build on and therefore improve practical tools accessible by anti-trafficking practitioners in their everyday work. Moreover, the knowledge produced can serve as evidence and as a basis for further training materials for law enforcement agencies and civil society front-line responders in the countries in which ICMPD operates. Additionally, the case studies and indicators established contribute to improved policy relevant knowledge for governmental institutions dealing with early identification of victims.

  The results will be publicly available outputs produced by ICMPD will be made available on ICMPD's website (www.icmpd.org) and disseminated to key academic, policy and practitioner stakeholders in ICMPD's network. ICMPD can also disseminate its results to key stakeholders in the anti-trafficking field with whom it regularly engages: ICMPD is currently the co-chair of the Inter Agency Coordination Group against Trafficking in Persons (ICAT) and a participant in the Alliance 8.7 platform with partners globally. All members and participants of such platforms are expected to share their materials and publications so as to keep them abreast of new research and policy developments. Scientific outputs will be available in academic journals and other academic outlets (e.g. academic conferences such as the annual IMISCOE conference, etc.). The users of the publicly available qualitative social science research results would be relevant knowledge producers such as the academic community, research departments of international organisations, and institutions that conduct and/or commission research. The users of the practical tools developed by ICMPD would be anti-trafficking practitioners and actors in the policy world. Some examples of the users of the practical tools are THB and CSA/E front line responders or those in charge of case identification, such as the police, labour inspectors, border officials, and even health and education professionals. Also, non-government stakeholders who work with vulnerable people will benefit from the knowledge and tools that are created to help them spot a possible victim and make the first referral.

  ICMPD's research results and work in HEROES will build on and contribute to a body of work on trafficking, focusing on the link with ICT-facilitated cases of trafficking and relevant trafficking and CSA/E trends for the research countries. Therefore, for the academic and policy communities, the advantage is more up-to-date data on these particular aspects with regard to these crimes. With regard to the practical manuals ICMPD produces or contributes to, the results are quite direct, in terms of providing practitioners and HEROES end users direct access to these tools for use in their daily work.

Once the research is completed, ICMPD will examine how best to adapt the findings into policy-relevant recommendations, through for example a policy brief. For the practical tools, they will al ready be ready for use by practitioners.

- **SMEs (IDENER RD, TRI):** IDENER RD strategically invests in the research field of digital forensics, process engineering, data intelligence gathering, among others. To this end, HEROES is perfectly aligned with the goals of the company for the forthcoming years. The generated IP will be used to enrich its products that are provided to multi-stakeholders and commercially exploit them.

  Needs that could be solved by the IDENER results would be:

  - To prevent the online recruitment of potential THB victims (INDOOR tool)
  - Strengthen the capacities of LEAs and Multi-Stakeholders to investigate (INDOOR)
  - To optimise LEAs' automatic data collection procedures (RIMA)
  - To help LEAs' investigators carry out automated investigations (RIMA, PCG).

  Besides, three tools are going to be developed by IDENER in the execution of HEROES:

  - INDOOR tool: This tool's main objective is to identify whether a job offer is fair.
  - Real-time Instant Messaging Application Content acquisition (RIMA): This tool has three different parts: The first one is in charge of getting information from RIMA, the second one will process and determine which message can be interested in a LEAs investigation and the third one will create a report with this message.
  - Profile Content Generator (PCG): to propose the core mechanisms and requirements for requirements of a cyber-investigation tool that is capable of verifying digital traces to help investigators to be able to find clues and investigators to be able to find clues and evidence about a specific case, a suspect or context related to a context related to a specific topic. This tool is composed of different modules, one of them being one of the IDENER tools.

  Regarding the improvements over other tools, IDENER expects:

  INDOOR tool: This solution will not be exclusively a single model; It will be the entire ML pipeline that integrates different stages to the proper and safer training of the model. It will be implemented following best practices in the MLOps field.

  RIMA tool: The most significant improvements are the first part in getting information automatically about RIMAs.

  PCG tool: The improvements are based on the feedback that end users can give us.

  In terms of availability of the results, most of them are confidential. The rest of them will be published in a code repository like GitHub. Regarding the potential users of the tools, the main potential users of the tools themselves are LEAs or NGOs.

  However, IDENER always aims to test the solution in different sectors (with other datasets), so there is no door close to the potential users. Besides, the direct result from IDENER will be different models and tools that can be offered as a service. Apart of course of other indirect benefits are better-trained staff.

  Finally, IDENER expected the following TRLs:

  - RIMA: TRL5-6
  - INDOOR: TRL6-7
  - PCG: TRL7

TRI will further refine its ELSI impact assessment approach and gain further experience in security technology development. It will use this to inform its consultancy work in privacy-by-design and ethics-by-design, and training on THB response, as well as informing its data protection officer service. TRI will use the text-analysis work on HEROES as a potential option for integration with its STRIAD risk assessment platform.

Tri will expect impact in ethical, legal, societal, privacy, policy, technology design, training. Depending on the results that they develop, they might be able to apply results to technology development conducted by TRI colleagues. Further, they are developing new knowledge regarding modus operandi for THB, and they expect to pursue policy impacts from this. Additionally, they expect to provide the training programme to the transport industry,

TRI will make contributions to these open questions. There are also open questions around how criminals engage in THB in the UK, particularly county lines and cuckooing, where TRI has collated new knowledge on the operation of criminal gangs. Further, open questions regarding how transport workers should best respond to indicators of THB will be answered with the training programme.

The knowledge, understanding about the ethical, legal, societal, and privacy impacts of LEA and NGO technologies intended to prevent and investigate CSA/CSE will then be included in TRI's impact assessment, Ethics-by-Design, and Privacy-by-Design methodologies in the future. TRI has engaged in dissemination of knowledge generated about THB modus operandi and intends to publish this work. The training programme to be developed will be available to use with TRI's private clients.

Improvements over other tools, TRI's inputs will help LEA/NGO tools in the area of combatting CSA/CSE be the most ethical, le-gally-compliant, privacy-aware, and societally acceptable version that they can be. TRI's public outputs will be made available on the project website/Cordis in deliverables. TRI will also engage in publishing research papers based on work completed in HEROES. TRI's training programme will be available from TRI's consulting business. Primarily, the knowledge, understanding, and technology design strategies developed in HEROES will be used by TRI staff in future projects and, potentially, TRI technologies. The training programme is expected to be used by TRI staff. In addition, TRI expects to use the results in the following fields:

There is potential for TRI's research to have an impact in the area of information security, data protection, and legal regulation, depending how our work on the ethical, legal, and societal impacts of 'breaking' end-to-end encryption progresses. The training programme could be expanded into different areas of transport, or into other domains.

TRI outlines the main advantages of the new solution(s) it expects:

TRI's research results in HEROES are primarily expected to be applied by TRI research staff in other research projects where tools are developed for combatting CSA/CSE, or adjacent technologies. The advantages will be that solutions to emergent ethical, legal, and societal issues discovered in HEROES can be applied to other technologies much quicker, and additional research can be conducted in future projects to develop further Ethics-by-Design and Privacy-by-Design strategies.

The training programme will be used by TRI's consulting staff to provide training to transport workers on indicators of THB. It will provide an advantage for transport workers who will be aware of how they can better protect THB victims, as well as advantages to THB victims who could be protected from abuse.

TRI expect to have direct results in the form of:

- better impact assessment processes for analysing technologies intended to be used for the combatting of CSA/CSE;
- better ethical and privacy design strategies;

- a training programme.

After completion of the research and innovation, TRI will be a process of refining the HEROES results for further deployment. For example, innovative ethical and privacy design strategies will need to be tailored to future applications, and the training programme will need to be tailored to the intended audience.

Regarding the estimated time for commercialisation of the results, where future research project, or private client, needs match TRI's outputs from HEROES, commercialisation can happen nearly instantly. Where adaption of TRI's innovations and results is needed, this will depend on how much adaption is needed.

For application of results to commercial products, private funding for personnel costs will be needed. The level of financial resources needed for bringing innovation to market will de-pend on the level of adaption needed.

Finally, rather than TRL, TRI's work is better viewed in terms of Societal Readiness Levels.

Impact Assessment methodology and ethical and privacy design strategies specifically for assessing tools used to combat CSA/CSE and THB are expected to progress from SRL 2 at the beginning of the project to 5/6 at the end. The training course is expected to progress from SRL 2 at the beginning of the project to 6 at the end.

The main obstacles to the implementation of any of its results are shown in Table 3.

Table 3: Tackle the barriers for apply the results (SMEs)

Barriers	Solution
Inadequate financing	- It will depend on the result at the end of the project, but our expectation is that they will not need more financing to commercialise the tools. - If external financing is not available, TRI will provide internal financing to apply strategically beneficial innovations from TRI to it's own products.
Skills shortages	- With the job already done, they know that they have enough skill. - Where TRI experiences skills shortages, it first explores internal capabilities or hires new talent to fill any gaps.
Regulation that hinders innovation	- It can be one of the main problems. The regulation that doesn't allow us to access data needs to develop the tools due to ethical issues. The only solution will be to create synthetic data. - TRI develops innovative approaches in harmony with new regulation, so as to remain in compliance.
Intellectual property right issues	- All the components that will be used have been checked previously and are completely open-source. - During collaborations in HEROES, TRI develops new IP separately from other partners to avoid IPR issues.
Traditional value chains that are less keen to innovate	- In a field as sensitive as Heroes focus. It is impossible to remove the person from the loop because all the tools have been developed with this in mind. - TRI explains the benefits of innovation and the process and technological designs that it can provide to more traditional customers.
Incompatibility between parts of systems (lack of standards)	- Despite not all the parts of the systems needing to be connected, the CASE Ontology will be used to facilitate the compatibility and adaptation of new users. - TRI has an internal process for linking research and commercial parts of its business to ensure compatibility.
Mismatch between market needs and the solution.	- It will depend on the result at the end of the project but our expectation is that they will not need more financing to commercialise the tools. - TRI develops new innovations with an eye toward future market needs. If innovations are developed without a clear market, TRI can conduct further innovation orientated toward market exploitation in future research projects.

- **NGOs (ICMEC CH, CWCS, KOPZI, APAV, RENACER, GCR, ASBRAD, GI-TOC):** The NGOs will be involved in qualitative study of THB and CSA/CSE prevention, investigation and victim assistance processes, identify barriers, use HEROES tools for early identification of potential victims, manual assessing barriers, remedies and harmful practices on treatment of victims. Assist in development of educational materials and undertake child rights promotion campaigns with stakeholders and children. The NGOs will use HEROES outcomes to restructure the national strategy towards THB and child exploitation victims including more scientific based approach to identification, support, integrate and follow-up them. The existing gaps in providing positive results while organizing the legal processes in the THB field will be covered by the advanced models developed by HEROES.

  ICMEC CH is an organisation that provides technical assistance to countries to strengthen their response capacities to the THB and CSA/CSE, for which it will provide the construction of protocol models and studies of the situation on prevention, research and attention to victims to promote legislative changes and public policies. ICMEC CH will also provide specialised training for the implementation of recommendations.

  ICMEC's tasks are focusing on Prevention and Victim's assistance. More specifically, their tasks will empower professionals to better care for children victims of CSEA and THB, raise awareness on the issues and give tools to prevent them from happening, and provide research on best practice and gaps on solving these issues in consortium countries.

  The identification of gaps in investigations and legislations in the countries in focus will encourage the development of solutions to fill up these gaps. Moreover, our tasks will support parents, carers, law enforcement units, judges, prosecutors, educators, medical professionals, and anyone with a duty of care towards children to know how to deal with conversations, suspicions, disclosure and reporting of CSEA and THB, and what follows.

  In terms of ICMPD outcomes, the professionals that will be trained under the HEROES project will have a better understanding of what (O)CSEA and THB are, why they might happen, how, by whom and on whom, and what to do if they happen. Especially, key stakeholders will have the tools to develop a protocol to care for THB and CSA/CSE victims and prevent re-victimisation. Moreover, adults with a duty of care towards children will learn about online CSEA and how to prevent it in an accessible guide full of useful and handy resources. Finally, national actors will learn about international best practices and understand what they can implement to ensure that children are cared for in the best way possible, especially those who suffered through (O)SCEA, THB and those who go missing.

  Regarding the improvements respect other tools, each product is based on the state-of-the-art research and available international knowledge on the issues and on the tools that are part of the solution to the issues. As crimes against children evolve with time, especially as technology changes and allows for more to happen online, updating the research, specialised training and guidelines provided to stakeholders is crucial to keep up with those who pose a threat to children. The HEROES project is enabling to create the most up-to-date products thanks to ICMEC's and the Consortium's expertise.

  As for the availability of the results, two of the seven of our products are confidential and for the Consortium's use only.

  Training plans and programmes, protocols and training will be accessible on the ICMEC website and colleagues can be contacted in case someone is interested in organising a live training event.

  The guidelines will be widely disseminated using ICMEC and partner contacts as well as social media communication. They are planning to create a new microsite or landing page that will be linked to the ICMEC website for easy access, depending on the budget.

  Targeted users, depending on the tasks, are parents, carers, law enforcement units, governments, judges, prosecutors, educators, medical professionals, and anyone with a duty of care towards children.

The target users, depending on the tasks, are parents, caregivers, law enforcement, governments, judges, prosecutors, educators, medical professionals and anyone who has a duty of care for children.

Regarding other technological field that could use their results, any telecommunication technology, social media organisations or Internet Service Providers could make good use of our tasks. They also believe that banking, including online and cryptocurrency companies, could benefit from our training and guidelines. Finally, any organisation dealing with forensics, domain registry, connected devices (such as laptops, smartphones, etc.) could find an interest in our solutions to fight CSEA and THB that might happen through their services.

In terms of the benefits of the new solution(s) it expects, ICMEC CH hopes that the results of its research will encourage stakeholders to address the gaps found: they expect governments to dedicate resources to fill these gaps and NGOs to support and draft proposals for solutions. They also envisage that their training sessions will provide tools and train professionals to use internationally recognised best practices in addressing the problems of CSE and THB, especially with children. Lastly, they hope that any adult who interact with children in personal or professional settings to know how to support children victims of CSEA or THB, and to have discussions and implement ways to prevent children from being victimised.

Their new training developed for the purpose of HEROES is a live training (which can happen online or in person), but they understand that not every professional will be available for long periods of time. A further step for more accessibility, thus more impact, would be to provide an e-learning on demand element, which is not doable within the scope of HEROES.

Finally, ICMEC will not bring its research findings to the market.

KOPZI is supporting persons who already are victims of Human Trafficking or sexual violence so KOPZI biggest impact could be proving secondary preventions to these persons or proving prevention action in the country in general. Also, it could quite be valuable to share with other NGOs or GOs in Lithuania the knowledge and tools of the project thus pushing the performance on a new level. Hopes of having kind of scientific methodologies in the fight against child rapists or human traffickers. The needs that could be solved by the results are:

- Lack of appropriate tools identifying grooming on the Internet
- Lacking knowledge about who the pedophiles are, how they behave etc
- Lack of effective ways for the victims to approach police or other entities

Also, KOPZI outputs will be:

- Verification of the created tools by the partners
- Training sessions inside the national country for the social workers
- Psychologists, municipality officers on the dangers of grooming or recruiting and using the visuals and guides created by the partners

Improvements over other tools, KOPZI will have a more scientific approach that is better structured and organized which will help with what is really important – allowing to see the whole picture and understand the causes and the consequences (e.g. trauma).

The results will be available on the website www.anti-trafficking.lt

Regarding the potential users, KOZPI has identified the following users:

- Actual and potential victims of THB
- Actual and potential victims of sexual violence

- Parents, community members
- Social workers
- Psychologists
- Police officers, prosecutors, judges

KOPZI outlines the main advantages of the new solution(s) it expects:

- The main problem in Lithuania in their field is a big lack of tools to identify, to support and to prevent crimes. So, once they have ones it will allow for the buildup of knowledge of the professionals thus in future, they hope to have less undetected crime against children or vulnerable groups in the communities. The positive impact on the national Child protection policy and anti-Trafficking policy is much expected.

After completion of the research and innovation, KOPZI proposes the following examples of how to apply the obtained results and practice:

- Standards to be agreed on
- Financing the testing
- Scaling up or production
- Promoting acceptance by consumers or other partners in a value chain.
- Policymakers may also establish follow-up steps to work the results into policies.

APAV is the largest not for profit and charitable organisation in Portugal with 30 years' experience in providing confidential, qualified and free of charge victim support services to victims of all crimes. APAV expect to make an impact in:

In the quality of CSO and, more specifically, a victim support organisation, they aim not only to ensure that a victim-centric approach is imprinted in each and every aspect of HEROES methodologies, activities and technologic tools, but foremost they expect victims of THB and CSA/CSE will be better protected, assisted and that their rights and needs are assured. In the victim assistance strand of HEROES and by focusing on preventing and developing technologic tools for more effective investigations, four main impacts are foreseen:

- i) reducing primary, repeated and secondary victimisation.
- ii) contributing to specialised training and specialised support to victims, in accordance with specific needs of victims of THB and CSA/CSE and their rights as per provisioned in national laws, including that of access to specialised support services.
- iii) promoting victim support strategies focused on the specific needs of these victims, including the development of new practices within the justice system to avoid secondary victimisation and reduce the insidious impact of victimisation.
- iv) build upon project's findings to promote better procedures and outcomes in assisting victims of THB and CSA/CSE crimes, including but not limited to cooperation procedures between all relevant stakeholders (both at national and transnational level, namely cross-border cooperation) and improved victim support procedures.

The needs that could be solved by the results are:

APAV is leader of Work Package 9 – Test Cases Implementation and Validation, with the central objective of validating HEROES' tools and outcomes through several pilot-cases to be conducted at EU and Latin-America LEAs level, who will pilot the technologies developed in real environment. WP 9

provided opportunity for LEAs to obtain practical experience with the tools developed and their ability to use such systems effectively will also be assessed. Within the work plan, the consortium will verify whether the tools are aligned with the requested TRL's, whilst allowing for a more concrete perspective on the impact technology will have in fighting against crime. An innovative curriculum will also be designed aiming at creating a network of trained LEAs in using advanced technology in their criminal investigation work, including those involved in the pilot exercises. Bearing the above in mind, tasks will support HEROES in ensuring that challenges and difficulties experienced by LEAs and NGO's (end-users) are encompassed in the technologic proposed solutions, whilst assessing the way they will have an actual impact in their daily work of preventing and in estimating THB and CSA/CSE and supporting its victims. Due account for victims' rights and needs will preside the design and implementation of the work plan (Pilot design and specifications, D9.1 and Final Pilots Validation Report, D9.8). More objectively, the results of APAV's tasks will allow HEROES to assess if the use-cases and the scenarios therein (within each specific challenges are already outlined and identified under WP2, D2.2), combined with technologic solutions, respond to the issues/challenges and needs posed by end-users, namely:

- The need of effective OSINT tools to gather important intel regarding the main criminal activities and also other criminal offences that might be associated to a specific case under investigation.
- Identify if anonymity techniques are being used to mask the real IP address of offenders.
- Training for relevant LEAs on usage of the technologic tools, without losing a victim-centric approach throughout their investigations.
- Automation of the detection processes of CSA/CSE, and cross-checking with existing CSA/CSE databases, in order to better identify if LEAs have encountered new content.
- Interoperability of some of the tools with different platforms (for instance, social media and instant-messaging platforms), whilst being available for operation by different investigators that are assigned to a specific criminal investigation remotely.
- Reporting application that safeguards whistle-blowers anonymity and, at the same time, provides the ability to share relevant data with LEAs (e.g., attachment of photos, videos or links);
- A toolset capable to retrieve information about the source, authenticity and/or the type of manipulation of a given file.

Further to the prior, the methodology will allow the consortium to build reliable, coherent and consolidated solutions in accordance with both the expectations/needs of end-users and safeguarding the needs and rights of victims of CSA/CSE and THB. In fact, the methodology to be adopted are deemed essential to adjust the technologic solutions in terms of: - Impact; - Usability; - Functionality; - Efficiency. Bearing in mind that the proposed solutions aim to improve the prevention, identification and victims' assistance, the implementation and completion of all tasks must include a victim-centric approach. In order to ensure that such an approach is put in place, not only awareness will be raised towards victims' rights and needs, but end-users will also be called upon to offer their insights as to whether the technological solutions will support them in interacting with victims of CSA/CSE and of THB, whilst promoting a victim-oriented investigation. In a similar fashion, technology developers will provide a more concrete perception of how victims' rights and needs were considered throughout the development of the technologic solutions, as well as whether specific features were introduced to ensure due safeguards. With regard to use-cases combined with technological solutions assessed during the pilots' phase, a number of challenges posed by NGOs towards use-case scenarios shall be duly accounted for:

1. The importance of a maintaining a strong cooperation between NGOs and LEAs to strengthen their capacity of addressing the different scenarios (e.g. if LEA's share with NGO's examples of, for instances, fake job offers, the latter will be more capable not only to identify more cases of fake job

offers but also to identify an increased number of potential victims; furthermore, awareness raising campaigns targeted to vulnerable groups and the general public could be developed, not only towards the dynamics of THB and how to better identify fake job offers but also on both support services and where and how to safely report the - potential - crime.).

2. In this sense, reporting tools should give access not only to a LEA response/contact details but also should activate/give information about local Victim Support Services.

3. Technological tools should also empower victims to take immediate action by providing relevant information (e.g., individual assessment of needs and risk assessment tools), as well as information/contacts of Victim Support Services and of tools that may help mitigate the impacts of the victimisation (e.g., self-help tools, informative contents).

In addition, APAV outputs will be:

- design the pilots, the methodology for their implementation and establish how results will be comparable (D9.1).
- evaluate the information and data collected from the pilot phases I and II, determining whether they were effective in terms of correct execution and reliability of results (D9.8). To this end, questionnaires will be developed to assess the degree of adherence of the investigative tools by LEAs after using the technologic solutions. These tasks will furthermore be subject to 2 reviews to guarantee the effectiveness of use cases, technologies, needs and requirements.

No products or technologies will be developed by APAV.

Improvements over other tools, KOPZI will have a more scientific approach that is better structured and organized which will help with what is really important – allowing to see the whole picture and understand the causes and the consequences (e.g. trauma).

During the project, outputs will be made available to the whole consortium and, where applicable, to other relevant stakeholders that might be involved in their development or might be potential end-users (for instances, the Portuguese Police “Polícia Judiciária”, with reserved competence to investigate CSA/CSE and THB). After the duration of the project, the outputs and underlying methodology are prone to be made available/published in digital platforms and widely disseminated for replication and further exploitation.

Regarding the potential users, APAV has identified the following users:

- LEAs
- NGO’s
- Potential victims of CSE/CSE and THB

APAV outlines the main advantages of the new solution(s) it expects:

HEROES aims at strengthening and enhancing a coordinated response to LEAs and other stakeholders in relation to prevention, investigation and assistance to victims of CSA/CSE and THB. In this sense, expectation falls on the development and wide exploitation of the methodologies, procedures, technologic tools and cooperation procedures (of national, European and International scope) to:

- Prevent THB and CSA/CSE, not only by way of piloted and validated technologic solutions, but that will also allow for increased public awareness towards the phenomena and the modi operandi used by cyber-offenders, whilst offering possibility of increased participation of diverse social actors in identifying potential victims and sources of THB and CSA/CSE.

- Investigate THB and CSA/CSE, through innovative technologic tools, specifically designed to address the daily-investigative needs of LEAs, including challenges that arise at technical, ethical and legal levels and that are intimate linked to the criminal phenomena under study.
- Assisting Victims of THB and CSA/CSE, namely by way contributing to reduce primary, secondary and repeated victimisation, whilst building the capacity of stakeholders to imprint victim-centric procedures and victim support strategies focused on the specific needs and rights of these victims, including new practices within the justice system to avoid secondary victimisation.

Successful implementation and impact achieved through HEROES, with due exploitation of its outputs and outcomes, will therefore carry the following advantages:

- New tools, methodologies and procedures that will allow for early identification of victims of THB and CSA/CSE.
- Knowledge and procedures providing a thorough assessment of barriers, remedies and harmful practices on treatment of victims.
- Provide for robust evidence, data and tools to advocate for a restructure national strategy towards THB and CSA/CSE.
- After completion of the research and innovation, APAV proposes the following examples of how to apply the obtained results and practice:
- Promote and advocate for a restructure of national response (including policies, cooperation proto-cols, adoption of a victim-centric approach and improved victim support procedures) towards THB and CSA/CSE

Fundación Renacer is a non-governmental non-profit organization that has been working in Colombia since 1988 for the prevention and eradication of trafficking and commercial sexual exploitation of children and adolescents based on three lines of action: Comprehensive assistance to victims, prevention and investigation.

Renacer will hope to have an impact on the travel and tourism sector, especially on virtual platforms such as Airbnb, Uber and strategic allies in the Colombian context that are active in international contexts (Avianca and airports).

Needs that could be solved by the results are:

- Generate awareness actions for tourists to reduce the demand for CSE.

Besides, Renacer outputs will be:

- The general design of advertising strategy.
- Manual with the methodological design of training and design of the campaign so that it can be replicated

Regarding improvements over other tools, Renacer will improve various platforms in the context of travel and tourism.

Respects the results available, Renacer will be in charge of generating the storage of information and materials that arise within the project. It is estimated that a micro-website can be created that allows said access to interested parties.

Regarding the potential users, Renacer has identified the following users:

- Airlines, tourist service providers, and state tourism entities in Colombia.

Renacer outlines the main advantages of the new solution(s) it expects:

- The strategy is expected to be usable by stakeholders in the travel and tourism context.

In terms of the kind of output (such as a manual, a test, a model, a new therapy, a better product or process), Renacer highlights two:

- Better qualified staff, with a sense of ownership and attentiveness to child protection needs in the context of travel and tourism.
- Methodological document for the development of future communication initiatives (training, development and, if possible, dissemination).

Following the completion of the research and innovation, Renacer hopes that the proposed communication strategy will be implemented in the short term by various actors in the travel and tourism context and that it will be mobilised throughout the seasons and sustained over time.

The main challenge of Renacer will be financing the design of the communicative pieces and the wills of the interested parties who will be in charge of generating the dissemination actions, according to their will and administrative capacity in this regard.

Finally, in order to estimate the needs for the commercialisation of its results, it is expected that during the time of execution of the HEROES project, awareness-raising and training of tourism service providers will be carried out and the participatory design process will be carried out. It is also expected that within this process, companies and stakeholders can be linked to the development of the implementation and dissemination of the strategy, if they decide to generate funding actions.

GI-TOC (Global Initiative) is an independent civil-society organization, headquartered in Geneva, Switzerland, with a globally dispersed Secretariat and a high-level advisory board.

Its network members include prominent law-enforcement, governance and development practitioners who are dedicated to seeking new and innovative strategies and responses to organized crime.

GI-TOC hopes to have an impact in the field of technology and human trafficking.

The needs that could be solved by the results are:

- Highlight need for increased tech expertise among practitioners, amendment to the respective laws

Also, GI-TOC outputs will be:

- Country report for Peru, dissemination on local level

The results will be available through local partners

Regarding the potential users, GI-TOC has identified the following users:

- Peruvian cybercrime unit, national CSOs, law enforcement unit addressing human trafficking

Regarding other technological field that could use their results:

- Tech industry, actors on privacy issues

GI-TOC outlines the main advantages of the new solution(s) it expects:

- Report will induce capacity building for practitioners, (hopefully) lead to law amendments,

The main obstacles to the implementation of any of its results are shown in **Error! Reference source not found.** below:

CWCS is a research-based organization and have conducted about 8 studies on trafficking

in women and children in addition to research on child abuse and exploitation and it will

perform the task of research on THB and CSA/CSE in the context of Bangladesh

CWCS hopes to have an impact in the area of Online child sexual exploitation and abuse which has still not been identified or addressed by policy planners due to its clandestine nature, the HEROES project will definitely make an impact when it will be discussed in various meetings with policy makers and initiate advocacy with them to take steps to save the potential victims of cybercrimes.

The need that could be addressed through the results of its tasks is mainly the issue of advocacy for children's rights, especially for abused, exploited, and trafficked children, which remains a low priority issue, although good laws and policies for child protection, advocacy and victim assistance exist but are not adequately implemented. Under Task 5.6, advocacy meetings will be held at policy level with various key stakeholders, highlighting the issue of children's rights, especially for abused, exploited, and trafficked children. In addition, the Red Heart Campaign has been launched to promote children's rights among vulnerable children. This will create awareness raising among the policy planners as well as community people to recognize, identify and assist child victims. Moreover, the issue of online child sexual exploitative have been shared in high level meetings with relevant government officials, UN agencies, development partners and NGOs for making a positive impact.

In addition, CWCS outputs will be:

- Awareness raising educational materials, occasional issue briefs, Red Heart Campaign briefs and badges.
- Promote Child Rights newsletter to document the activities and its outcomes will be prepared to create a social movement to safe children from all forms of exploitation.

Regarding the improvements, CWCS will provide relevant information especially on child sexual abuse/exploitation and trafficking which may feed in information that may improve other tools for example apps to report on online child exploitation and abuse by parents and care givers being developed under the HEROES project.

The results will be available will always be available in both printed and in online social media platforms during and after the project.

Regarding the potential users, CWCS has identified the following users:

- Potential users of their end results especially the awareness and educational materials will be parents, guardians, teachers, social workers, UN agencies, INGOs, NGOs, government agencies and community people.

Regarding other technological field that could use their results:

- The Internet service providers can avail the results for more clarification and to address the issue more effectively.

CWCS outlines the main advantages of the new solution(s) it expects:

- When the results of Task 5.6 will be widely disseminated among policy planners, then it will be taken as a priority issue of the government to address and accordingly measures/steps will be taken to save children from online sexual abuse, exploitation and trafficking which is still not very discussed in government policy level meetings.

Besides, direct results will be publication of Issue briefs for clear understanding, awareness and educational materials, newsletters etc.

Indirect result will be improved safety online for children.

Following the completion of the research and innovation, the research and innovation being initiated by CWCS such as the launching of the Red Heart Campaign to Promote Child Rights of Abused, Exploited and Trafficked Children need to be scaled up and more advocacy at all levels should be undertaken for wide dissemination, acceptance and ownership among both government and non-government actors working with children's issues. Emphasize should be focused on policy makers to take follow-up steps to formulate policies and monitor the measures being formulated by government and non-government agencies. In addition, the expected TRLs of the tool being developed by CWCS will be mainly keeping track through monitoring the end results especially the steps, measures or good practices being undertaken by various stakeholders.

In terms of estimated time to market, their expect 2-3 years to market and realise the vision and mission of the Red Heart Campaign to Promote Child Rights.

Finally, to make CWCS innovation which is the Red Heart Campaign to Promote Child Rights to the global market, they need various types of financial resources namely:

- Data collecting on recent incidents of online child abuse and exploitation to identify the forms and modus operandi etc.
- Accordingly, updating and development of awareness and educational materials
- Identifying the stakeholders who will be use and benefit by the developed materials
- Formulate a market strategy
- Continuous monitoring of end results.

The main obstacles to the implementation of any of its results are shown in Table 4.

Table 4: Tackle the barriers for apply the results (CWCS)

Barriers	Solution
Inadequate financing	- Post-HEROES, apply to other grants and funding to expand tasks develop as part of HEROES. - Will formulate proposals and apply for funding.
Skills shortages	- As a first step, look within the Consortium for support, and then hire third party actors. - Include an element on multi-sectoral coordination in roll-out phase - Attend skill development training.
Regulation that hinders innovation	- Use ICMEC's contacts and expertise to encourage a legislation that protects children more efficiently. - Coordination with all relevant stakeholders. - Will do lobbying for taking in up by policy makers.
Intellectual property right issues	- Letters of Agreements with the concerned party. - Will address it according to the legal framework of the government.
Traditional value chains that are less keen to innovate	- Use different providers and partners - It's primary resource dependent - Will try to motivate community people.
Incompatibility between parts of systems (lack of standards)	- Follow-up project would be necessary. - Will try to convince policy makers to formulate standards.
Mismatch between market needs and the solution.	- Rethink the solution: each of the tasks that they are developing are based on needs, and everything they do is thought with the positive results that need to be achieved and gaps to be fulfilled in mind, for a useful, efficient and sustainable impact. - Coordination with all relevant stakeholders. - Will not arise because it deals with a very sensitive issue i.e. child sexual abuse, exploitation and trafficking which is geared towards the market needs and its immediate solution is a priority issue for all.

- **LEAs (ESMIR, ELAS, SPL, GDCOC, BFPD, PRF):** LEAs are one of the main end-users of HEROES and will use various methodological and technological solutions to fight THB and CSA/CSE crimes. Besides, HEROES will help to achieve each country's security objectives and contribute to better decision-making by policymakers. Furthermore, LEAs will also promote the concept and outcomes of the HEROES project to National and European fora and stakeholders' groups (e.g. EUROPOL, INTERPOL, ENLETS, etc) where they normally and officially participate.

  The Spanish National Police Force (ESMIR) is a police force (LEA) born in 1824, since their origin has been growing as a police force up to the present day. Currently is a more than 70.000 police officers Law Enforcement Agency with competences in all Spanish territory.

  ESMIR hopes to have an impact development of the training curricula, and the readiness of the tech tools, as refining the use cases.

  The needs that could be addressed are:

  - Use cases, requirements of the end-users regarding how technological (and non-technological) tools will be developed.

  In addition, ESMIR outputs will be:

  - Contribution to the development of useful tools, as those should fit the needs of the LEA's.
  - Also contributing to the spread of the use of tools, or components, if suitable as part of the exploitation plan.

  Regarding the improvements, ESMIR the tools will have a more integrated multi-stakeholders' vision, so will meet a wider scope rather than those developed by a single company, or based just in an specific type or needs (LEA vs NGO vs CIVIL SOCIETY).

  The results will be available may be public, and mainly regarding the non-technological tools, could be spread as part of the dissemination program (infographics, training materials, …)

  Regarding the potential users, ESMIR has identified the following users:

  - LEAs based.

  Regarding other technological field that could use their results:

  - Any in the web intelligence and digital forensic area.

  ESMIR outlines the main advantages of the new solution(s) it expects:

  - When they expect at the end of the project to have at least some tools in a TRL & SRL high enough to use them as pilot, and further contribute to increase the readiness.

  Following the completion of the research and innovation, further steps may be required in all areas, from policymaking, to adoption and standardization of training materials, and even further use and improvement of tech-tools.

  In addition, the expected TRLs, from LEA's perspective, is a 6-7, with a real and possible use (although in pilot) will be much appreciated by them.

  The General Directorate Combating Organized Crime is a specialized operation and search service of the Ministry of Interior for combating and dismantling the criminal activity of local and transnational criminal structures. The **GDCOC** carries out independently or jointly with other specialized bodies activities of operation and search, informational and organizational nature to combat organized crime. The GDCOC pursues active international operational police co-operation in accordance with international treaties, to which the Republic of Bulgaria is a party.

GDCOC hopes to have an impact in the investigation of Child Sexual Exploitation online, as well as Trafficking of Human Beings.

The needs that could be addressed are:

- The needs that would be solved thanks to the results of the tasks are giving access to innovative tools that would improve the capacities of Law Enforcement Authorities and add up quality to investigation aiming to acquire data for offenders or identify victims of criminal acts. That would lead to a creating more effective investigative techniques, higher percentage of resolved crimes and more victim – cantered approach.

In addition, GDCOC outputs will be:

- Their organization is a Law Enforcements Agency that supports the outputs of the project by providing expertise and practical advice.

Regarding the improvements, developed product by GDCOC will create opportunity for improvement of the existing tools and practices. It would also create field for international cooperation between international LEA's and other partner organisations.

Regarding the potential users, has identified the following users:

- LEA's, Government organizations, NGO's.

GDCOC outlines the main advantages of the new solution(s) it expects:

- The solutions that would come out of the project would be applied by the interested parties daily in their professional activities. The main advantages include spreading the knowledge for specific types of crimes and the provision of tools that would help identify victims and combat offences.

The Hellenic Police is subordinated to the Ministry of Citizen Protection. Hellenic Police is comprised of both central and regional Services. Its efforts centre on the fulfilment of the Force`s mission, within the framework of the Ministry of Interior`s policy. **HP** hopes to have an impact expected to make an impact in the international plans of action in the context of THB and CSA/CSE investigations through surface web and the dark web. LEAs that deal with this type of crimes will have the opportunity to use the HEROES solutions in their fight against the crimes.

Hellenic's Police task results will feed the HEROES program with the end-user information related to the operational, technical and training requirements in order the appropriate use cases to be developed and tested. In this way, HP will contribute in the researching and the developing of tools, algorithms and protocols that suit the social and technological needs related to THB, CSA/CSE crimes and also contribute in a better decision-making by policymakers, achieving in this way Greece's security objectives.

In addition, HP outputs will be:

- Hellenic Police, through its contribution to the working packages, has the intention to formulate the HEROES developing tools with specific operational capacities that will distinguish them and advance them from already existing tools, through the recognition of the needs of the Service during the exercise of its duties and through the Use Cases to which the were asked to contribute with our previous experience.

Regarding the improvements, HP the tools produced through the HEROES project, are expected to offer improvements in all apects of CSE/CSE crimes, including prevention, investigation and victim assistance.

- In the aspect of prevention, expected improvements have to do with the issues of:
  - psychological, social and economic factors that influence THB & CSA/CSE crimes

- information exchange and collaboration
- integral prevention
- anti-grooming tactics
- citizen reporting
- identifying fake job offers
- prevention campaigns and education

- As far as investigation is concerned, improvements are expected to be seen in:
  - automatic CSEM/CSAM identification and classification
  - real-time IMA content acquisition
  - file context analysis from seized devices
  - legal challenges for enhaced agents
  - OSINT tools
  - forgery and source acquisition analysis
  - fake profile and content generation
  - P2P CSAM/CSEM identification
- Regarding victim assistance, innovations are expected in the matters of:
  - harmonization of legal framework of THB and CSA/CSE crimes
  - analysis of treatment barriers for THB and CSA/CSE victims
  - integral victim assistance
  - enhanced training curricula

Besides, Hellenic Police as a LEA will test and examine the availability of HEROES tools in the fight against THB and CSA/CSE.

Regarding the potential users, HP (Potential users of our results will be the majority of Hellenic Police Departments) has identified the following users:

- Hellenic Police Forensic Science Division
- Hellenic Police Cyber Crime Division
- Hellenic Police Intelligence Division
- Sub-Division for dealing with Organized Crime/Department for Fighting Human Traffick-ing at the Attica and Thessalonica Police Divisions
- Sub-Division for Fugitives and Missing persons
- Sub-Division of Child Protection at the Attica and Thessalonica Police Divisions Agencies of Hellenic Police that proceed investigations THB and CSA/CSE.
- EU and non-EU LEAs in the fight against THB and CSA/CSE.

Regarding other technological field that could use their results:

- Any in the web intelligence and digital forensic area.

HP outlines the main advantages of the new solution(s) it expects:

- The resulting tools of the HEROES project are expected to be put in use by LEAs and NGOs, along with CSOs according to their jurisdictions. They will not be limited in aiding the investigation of CSE/CSA and THB crimes, but also in reforming how prevention and victim assistance takes place.

Following the completion of the research and innovation, Hellenic Police as a LEA will test and examine the suitability of HEROES tools in the fight against THB and CSA/CSE.

In addition, the expected technology readiness level (TRL) is 6-7.

The main obstacles to the implementation of any of its results are shown in Table 5.

Table 5: Tackle the barriers for apply the results (LEAs)

Barriers	Solution
Inadequate financing	- Look for other funding programmes.
Skills shortages	- Binding with skilled partners. - HP Officers possess the skills
Regulation that hinders innovation	- Promoting legislative changes - HP will examine the adjustment with national regulation system.
Intellectual property right issues	- Looking for alternatives
Traditional value chains that are less keen to innovate	- Promote transformation an integration of innovation on those chains. - HP will try to merge traditional and innovative value chains
Incompatibility between parts of systems (lack of standards)	- Higher standardization will be more appreciated than a TRL/SRL higher. - HP will try to resolve incompatibility between parts of systems (creation of standards)
Mismatch between market needs and the solution.	- Engaging into the loop more and better qualified end-users.

- **GOVERNMENT ORGANISATION (SIEE):** Public entity is responsible for the National Intelligence System that will improve the decision-making process of the legislative and executive power to effectively fight organised crime and especially against the THB and CSA/CSE. They will promote the dissemination of the legal and social experiences of HEROES to other countries through cooperation agreements.

6. Key Exploitable Results

For the selection of the key exploitable outputs of the HEROES project, an exhaustive analysis was carried out of all the outputs generated by the project partners, which are structured around its three main components: Prevention, Research and Victim Assistance. This process involved the identification of both commercial and non-commercial outputs, categorizing them according to each of the aforementioned pillars.

An essential criterion in the KER selection process was the prioritization and classification of the results, distinguishing between main results and key exploitable results. To make this distinction, several factors were taken into account, first the potential impact of each outcome was assessed. To this end, we considered the contribution of each outcome to the achievement of the project objectives and its ability to address the specific needs of stakeholders and potential users, related to Prevention, Research and Victim Assistance.

In addition, we took into account the technical viability of each outcome and the ability to successfully implement and execute each KER, considering the available resources and technical capabilities of the partners involved. All this with the objective of ensuring that the exploitation of the key results were achievable within the timeframe foreseen for this.

The list of selected Key Exploitable Results (KERs) is presented Table 6. In the following table, we have compiled the information related to each KER and the partners involved in its development.

Table 6: KER Nº1 - Anti-grooming Mobile App

Key Exploitable Result (KER Nº1) Anti-grooming Mobile App (AGapp)		**Leader**
Description	Mobile application that reduces the risk of a child to be a victim of grooming through social networks.	UCM
Type/ Format	Software	
Potential Users/ Stakeholders/ Market	Civil Society, NGOs, Citizens.	
Benefits for users	**Civil Society:** The anti-grooming mobile application improves the safety of individuals, especially minors by actively monitoring and detecting possible online bullying activities. This contributes to creating a safer online environment. **NGOs:** NGOs focused on child protection and online safety can benefit from the antigrooming app by using it as a tool to promote and support their cause, contributing to their efforts to promote a safer online space for children. **Citizens:** Parents and guardians will have a reliable mobile app to protect their children from online bullying. The approach of this application allows addressing potential risks by actively monitoring the messages received by the child, automatically blocking the sending or receiving of inappropriate content and alerting about potentially dangerous activity, in order to reduce the child's exposure and preserve evidence for future investigations.	
Competitors	Currently, there are various solutions that seek to filter the content shown to a minor and control its use. These tools allow parents to establish controls over the use of the Internet and mobile devices of minors. Among the main features of these applications are call blocking, usage time management, activity log and emergency button. The current market offers various parental control solutions: Google SafeSearch, developed by Google, focuses on filtering explicit content in search results, particularly images or videos containing nudity. Google Family Link: is a comprehensive parental control tool, enabling parents to manage and monitor their child's device, with features like content restrictions and app management. FamilyGuard: is another parental control app popular for its features such as content restrictions, app approval, and location monitoring. mSpy: serves as a monitoring application for mobile and computer devices but the installation process is complex.	

	In the antigrooming application, algorithms and agile image, video and text processing methods have been developed in order to optimize resources in the mobile device while preserving the privacy of user data. In addition, for the implementation of Machine Learning algorithms, models with low resource and storage consumption are taken into account, using on-demand usage methods in order to avoid a drop in device performance, overheating or high battery consumption. Among the main functions that differentiate the proposed solution from the parental control solutions available on the market, the following stand out: • The processing is done in real time. As soon as an image, video or text is received, the algorithms give a prediction in less than a second. • It is not necessary to use an active internet connection for processing multimedia material, all predictions of the implemented models are performed offline. • Active monitoring of incoming messages to the child's device, alerting of any potentially inappropriate activity. • Encryption of content detected as potentially dangerous is performed in order to reduce the child's exposure and preserve evidence. • It allows reporting any indication of a crime to the LEAs. • Through the use of federated learning, constant improvements are made to machine learning algorithms, but without the need to expose the data of the child's device, preserving the user's privacy.	
Potential impact	**Society:** Help parents or guardians to protect minors by reducing the risk of exposure of the minor in potentially dangerous situations online. This can help raise awareness about the risks of online grooming and the importance of protecting children in the digital world. **Victims:** By detecting and blocking online grooming attempts, more children can be prevented from becoming victims. In addition, by sending notifications to LEAs about possible grooming attempts, victims and their families will be able to seek justice. **LEAs:** The app provides a mechanism for reporting possible crimes, allowing law enforcement to receive alerts about suspicious activity. This streamlines the identification of potential offenders and facilitates early intervention in cases of online grooming. **NGOs:** Organizations working to protect children online can leverage this tool to strengthen their initiatives. By incorporating the application into their programs, they could improve the effectiveness of their efforts to combat online grooming and provide support to victims.	

Table 7: KER Nº2 - ACPIC

Key Exploitable Result (KER Nº2) Automatic CSAM/CSEM Identification and Classification Tool (ACPIC)		**Leader**
Description	The manual analysis of the media files, coming either from the Web or from seized devices, in order to determine whether it contains CSAM/CSEM require a lot of efforts. A solution based on computer vision algorithms is proposed to automatically detect this content to help LEAs to save time in their investigations.	INRIA
Type/ Format	Software	
Potential Users/ Stakeholders/ Market	LEAs, academic researchers.	
Benefits for users	This output will help LEAs identify newly produced CSAM/CSEM files.	
Competitors	The competitors employ mostly hash matching technology which are reliable to detect CSAM/CSEM but depends on an existing database.	
Potential impact	**Society:** Improve or draw the statistics on CSAM presence as it can process automatically much more materials. **Victims:** Decrease the missing identification rate of victims. **LEAs:** Significantly accelerate the process of medias and save manpower.	

Table 8: KER Nº3 - Citizen Reporting App

Key Exploitable Result (KER Nº3) Citizen Reporting App (CR)		Leader
Description	The goal of this app is to win precious time in the processing and investigation of potential CSEA and THB cases. Users are citizens who witnessed or heard about possible CSEA and/or THB incidents, who then try to help by reporting as much information about the incident as possible to the appropriate law enforcement agencies (LEAs). The reporting is done via this app, by answering specific questions such as the date, time, location, description of crime scene, what happened, etc. (to prevent the need to take a photo, which might be difficult or dangerous to do in certain circumstances). The report is then sent to their local police, who will assess the submitted information and perform a triage to decide on the best action to follow.	UNIKENT
Type/ Format	Software	
Potential Users/ Stakeholders/ Market	Citizens, LEAs, NGOs.	
Benefits for users	**Citizens:** to perform their civic duty by reporting potential/suspected CSEA and THB incidents to their local LEA. **LEAs:** to be able to receive up to date input from the public about potential CSEA/THB incidents and then triage (allocate resources and react/respond) accordingly in a timely manner. **NGOs:** to be able to provide support to LEAs and citizens.	
Competitors	There are some other citizen reporting apps available (for example, ALERTCOPS), but they tend to be too generic for all sorts of crime-reporting (instead of more customised to CSEA and THB) and more specific to a particular country alone.	
Potential impact	**Society:** to provide an easy way to report potential CSEA/THB incidents, which in turn can make the society feel safer and more protected. In the long run, it is hoped that this might decrease CSEA/THB incidents, for example this might deter potential perpetrators because they are afraid of effective/widespread citizen reporting. Measures: number of reports in a timeframe (e.g. within a year). **Victims:** to increase the chance of victims being safeguarded and perpetrators being identified and brought to justice. Measures: number of victims helped based on reporting done via the app, as well as number of perpetrators investigated. **LEAs:** to be able to receive up-to-date and timely reports of potential CSEA/THB incidents, and act accordingly for safeguarding victims and investigating perpetrators (and potentially preventing potential future victims). Measures: number of reports in a timeframe; number of victims helped based on reporting done via the app, as well as number of perpetrators investigated. **NGOs:** to be able to customise their support to victims and LEA, as well as to devise effective intervention measures to address the patterns identified for their particular community or neighbourhood. Measures: number of reports in a timeframe; further statistical figures related to specific locale.	

Table 9: KER Nº4 - File Context Analysis from seized devices

Key Exploitable Result (KER Nº4) File Context Analysis from Seized Devices (FCA)		Leader
Description	Due to the interconnection of devices resulting from the growing number of gadgets connected to the internet today, thanks to technological advances, it is common for individuals to have multiple devices connected to the internet sharing data. These activities are often exploited by cybercriminals seeking ways to carry out illicit activities anonymously through the internet. Physical assets such as computers, hard drives, USB drives, smartphones, and virtual assets such as email accounts, clouds,	UCM

	and virtual servers located in space are seized during legal proceedings when a suspected offender is arrested under suspicion of cybercrime. All seized information must be processed by agents using forensic techniques, a complex and time-consuming task. While there are some automated tools that are useful during the analysis, they must be adapted to the context of the investigation and handled by professionals to minimize errors during the analysis. Furthermore, the success of the analysis depends on the analyst's ability to correctly identify patterns of information or relationships between documents that may indicate important evidence. Thanks to advances in technologies, architectures for information extraction and analysis are possible, generating advanced searches that can identify relationships between files based on a given term. Techniques such as Natural Language Processing stand out for their flexibility when performing document content analysis. The proposed solution is a context analysis tool on seized devices, which will enable automatic analysis of files contained on a seized device and allow agents to conduct intelligent searches, reducing analysis time and human error. Additionally, it will allow for the analysis of image files to detect text within them.
Type/ Format	Software
Potential Users/ Stakeholders/ Market	LEAs
Benefits for users	**Analysis Efficiency:** The tool automates the analysis of files contained on seized devices, significantly reducing the time needed to process large amounts of data. This allows LEAs to expedite the investigation process. **Smart Searches:** The ability to perform smart searches makes it easy to quickly identify relevant information. This improves the effectiveness of investigations, allowing LEAs to find key patterns and relationships between documents. **Reduction of Human Errors:** By integrating technologies such as Natural Language Processing, the tool minimizes the possibility of human errors during analysis, ensuring the accuracy of the results. **Context Adaptability:** The ability to adjust the tool to the specific context through custom algorithms and support for multiple languages allows LEAs to adapt the tool to their particular needs and work contexts.
Competitors	IBM Watson Natural Language Understanding (NLU) stands out as a powerful API that uses machine learning to derive meaning and metadata from unstructured text data. This tool covers a wide range of functions such as extracting categories, classification, entities, keywords, sentiment, emotion, relationships and syntax from textual data. AllenNLP is an open source natural language processing research library based on PyTorch and developed by the Allen Institute for AI. It provides a platform for solving NLP tasks and offers a wide collection of well-documented model implementations designed to a high level of quality. The library supports the development of next-generation deep learning models for a wide variety of linguistic tasks. The Google Cloud Natural Language API is an advanced natural language processing tool that allows developers to add sophisticated text analysis capabilities to their applications and services. Leveraging this cloud service, users can perform sentiment analysis to understand the emotional tone of a text, identify entities such as people, organizations, and places, and analyze relationships and connections between these entities. The Stanford NLP Group has been actively involved in named entity recognition and information extraction for several years. They have participated in several shared tasks and developed models for different domains, including biomedical articles and workshop announcements. The NER system developed by the Stanford NLP Group

	is a Java implementation known as CRFClassifier, which labels sequences of words in text that represent names of entities such as people, organizations, places, genes, and proteins. The main advantage of the proposed solution is that it will allow the tool to be adjusted to a specific context using personalized algorithms for the three work languages, allowing specific searches to be carried out and will allow reducing analysis times by integrating technologies such as Optical Character Recognition.	
Potential impact	**Victims:** Improved efficiency in the analysis of seized devices can lead LEAs to faster identification of perpetrators, recovery of relevant evidence and, ultimately, a greater possibility of pursuing legal action against those who have caused harm to the most vulnerable victims. **LEAs:** This result directly impacts LEAs by providing an advanced and adaptive tool for the context analysis of seized devices, as it not only speeds up processes, but also reduces the manual workload and minimizes potential errors, allowing LEAs to focus on law enforcement more effectively.	

Table 10: KER Nº5 - Identifying Fake Job Offers (INDOOR)

Key Exploitable Result (KER Nº5) Identifying Fake Job Offers (INDOOR)		**Leader**
Description	It's a common tactic to lure people to foreign countries by offering them appealing job opportunities, only to leave them stranded without employment, struggling with language barriers, and burdened by the expenses of their journey. The INDOOR tool has been designed to address this issue, with the primary goal of processing job offers whether they are individual offers that appear suspicious, or listings retrieved from job portals using machine learning, a natural language processing engine. The aim is to determine whether these offers are fair or fraudulent.	IDENER RD
Type/ Format	Software	
Potential Users/ Stakeholders/ Market	NGOs, LEAs, Job Offers portal owners	
Benefits for users	**LEAs:** They would be able to detect this job offer and start an investigation regarding it. **NGO:** They would be able to give support to the different people who are looking for jobs and are afraid of this situation. Both of them can pressure the job offer portal to remove the fake job and create a safer scenario. **Job offers portal owners:** To ensure that their portal is safe.	
Competitors	None	
Potential impact	**Society/Victims:** The most direct impact is on potential victims. The tool can protect job seekers from falling for fraudulent job offers, saving them from the harmful consequences that can happen after applying to be accepted in a fake job offer. Also, instances of job scams should be reduced if job portal offers want to collaborate. **NGO:** NGOs can use the tool to raise awareness about the risks associated with fake job offers and provide examples and check any job offer that any potential victim asks. Also, NGOs can collaborate with law enforcement and other stakeholders more effectively, as they can share data and information about fake job offers and work together to combat these issues. **LEAs:** With the tool's assistance in identifying fraudulent job postings, law enforcement can streamline investigations, allocate resources more efficiently, and focus on more complex cases.	

Table 11: KER Nº6 - Open Source Intelligence Tools (OSINT)

Key Exploitable Result (KER Nº6) Open Source Intelligence Tools (OSINT)	**Leader**

Description	It's a challenge of extracting information from various sources in an automated manner and subsequently searching for specific data to identify correlations. This difficulty hinders effective criminal investigations, prolonging the time from the initiation of an inquiry to prosecution. To address this, a dockerised tool has been developed, capable of retrieving intelligence from diverse social networks and other sources based on an input text. The tool's objective is to streamline criminal investigations by automating data collection and analysis, facilitating the identification of correlations and additional evidence.	ARC
Type/ Format	Software	
Potential Users/ Stakeholders/ Market	LEAs and related investigation and prosecution agencies	
Benefits for users	To leverage investigations and retrieve further information on suspects or data sources. It allows to understand potential correlation with other users and cases through the obtained information. If the tool is able to retrieve other proof such as potential CSAM/CSEM, it may allow the investigator to tie that evidence to the search.	
Competitors	The tool may use and be complemented with other OSINT technologies. So far, we offer scrapping capabilities on specific social media that no other tools offer. We have also the IPFS tool that enables hash-based matching and correlation.	
Contributing deliverables	D8.1 OSINT Data gathering toolkit	
Potential impact	The tool benefits society, victims, LEAs, NGOs. In general, it can speed-up investigations and their impact by finding other potential connections with perpetrators and cases. This way, more criminals can be found with less resources. The latter allows investigators to devote more time to other relevant tasks. Overall, the OSINT tool has a direct impact on society, by reducing victims and the related implications. For LEAs and the rest of organizations, it reduces effort and time required to accomplish tasks.	

Table 12: KER Nº7 - IPFS monitoring

Key Exploitable Result (KER Nº7) IPFS monitoring		**Leader**
Description	The tool provides a monitoring method for IPFS, a novel and robust P2P storage solution that has been repeatedly abused for the distribution of malicious content [26,27,28]. The provided tool will monitor the IPFS ecosystem to report IPs of users sharing known CSAM. Moreover, the tool will allow LEAs to go back in time, of around a month, to find the initial IPs sharing a specific content so that original uploaders can be traced. Transversal application to different LEAs	ARC
Type/ Format	Software	
Potential Users/ Stakeholders/ Market	LEAs and related investigation and prosecution agencies	
Benefits for users	To leverage investigations and retrieve further information on suspects or data sources. It allows to understand potential correlation with other users and cases through the obtained information. If the tool is able to retrieve other proof such as potential CSAM/CSEM, it may allow the investigator to tie that evidence to the search.	
Competitors	The tool may use and be complemented with other OSINT technologies. So far, we offer scrapping capabilities on specific social media that no other tools offer. We have also the IPFS tool that enables hash-based matching and correlation.	
Potential impact	The tool benefits society, victims, LEAs, NGOs. In general, it can speed-up investigations and their impact by finding other potential connections with perpetrators and cases. This way, more criminals can be found with less resources. The latter allows investigators to devote more time to other relevant tasks. Overall, the OSINT tool has a direct impact on society, by reducing victims and the related implications. For LEAs and the rest of organizations, it reduces effort and time required to accomplish tasks.	

Table 13: KER Nº7 - P2P CSAM/CSEM Identification Tool (P2PT)

Key Exploitable Result (KER Nº8) P2P CSAM/CSEM Identification Tool (P2PT)		**Leader**
Description	With the current/existing tools, there are still plenty (and increasing number) of illegal materials over peer-to-peer (P2P) networks that are not detected. This is (in part)	UNIKENT

	because the current tools are not capable in finding them. Therefore, we need a novel tool to address this issue. The tool being developed here has three main components: (1) to identify CSEA materials on P2P networks, (2) to download them, keeping records about them, and (3) to compute perceptual, average and wavelet hashes of the new items in order to be compared with those blacklisted by LEAs.	
Type/ Format	Software	
Potential Users/ Stakeholders/ Market	LEAs	
Benefits for users	LEAs: improving the ability to search for CSEA materials over peer-to-peer (P2P) networks. An additional benefit is the tool will be open source for LEAs across the world, hence more accessible, free (at least within the consortium and possibly across EU), and fine-tuneable to fit each LEA's purposes.	
Competitors	There are some other tools available, but they tend to be closed source, not necessarily free and can only be obtained by those with strong links with certain government agencies.	
Potential impact	**Society:** criminals and offending materials that were not detectable before will now have higher chances of being detected sooner. In turn, this will reduce the threat to society due to such criminal activities. Measures: number of criminals being investigated, and also the volume of CSEA materials that are being reported and removed from P2P networks. A reduction in the number of CSEA materials available over P2P networks will be seen as an indicator of success. **Victims:** to increase the chance of victims being safeguarded and perpetrators being identified and brought to justice. Measures: number of victims helped based on the identification done through the tool, as well as number of perpetrators investigated. **LEAs:** to be able to receive up-to-date and timely reports of potential CSEA materials over P2P networks, and act accordingly for safeguarding victims and investigating perpetrators (and potentially preventing potential future victims). Measures: number of detections/identifications in a timeframe; number of victims helped based on reporting done via the tool, as well as number of perpetrators investigated. **NGOs:** to be able to customise their support to victims and LEA, as well as to devise effective intervention measures; in some cases, it might even be possible to use the data to geolocate perpetrators and getting closer to victims (which can help for rehabilitating the perpetrators and saving the victims, respectively). Measures: number of perpetrators identified, and number of victims helped.	

Table 14: KER Nº8 - Profile/Content Generator (PCG)

Key Exploitable Result (KER Nº9) Profile/Content Generator (PCG)		**Leader**
Description	A profile cannot be instantaneously generated and employed in an investigation, no one will trust in that profile. So, it is requiring LEAs to invest many months in creating profiles, which they don´t know if are going to be use. It is with this consideration that these tools have been designed.	IDENER
Type/ Format	Software	
Potential Users/ Stakeholders/ Market	LEAs	
Benefits for users	Save time in the creation and manage of the fake profiles.	
Competitors	None	

Table 15: KER Nº9 - RIMA

Key Exploitable Result (KER Nº10) Real-time Instant Messaging Application Content Acquisition (RIMA)		Leader
Description	The RIMA tool addresses the growing problem of grooming on instant messaging applications (IMAs), with a particular focus on safeguarding minors. Given the alarming rise in grooming crimes and the associated risks for children in digital environments, RIMA employs advanced artificial intelligence algorithms to automatically analyze IMA content. This enables the identification and flagging of suspicious conversations, facilitating early detection and swift action by law enforcement agencies and child protection organizations.	IDENER
Type/ Format	Software	
Potential Users/ Stakeholders/ Market	LEAs	
Benefits for users	Save time to process conversation and detect more details of the conversations.	
Competitors	None	
Potential impact	**Society/Victims:** For society, this tool can contribute to the prevention of criminal activities, as LEAs can respond more effectively to threats. Specifically for victims, the more efficient management of undercover operations can mean faster justice and resolution of their cases. **NGO:** Not too much impact. Due to more efficient LEAs, there are fewer victims which should allow more time to support victims **LEAs:** The tool can significantly enhance LEAs' capabilities for gathering information for conversations where they didn´t think that there was value. It can identify relevant information, connections, and patterns that might otherwise be missed, aiding in the development of strong cases. Also, LEAs can operate more efficiently as the tool can automate the initial analysis of conversations, reducing the time and resources required to identify potential leads for investigations.	

Table 16: KER Nº10 - Best practices guidelines for trauma bonding identification protocol

Key Exploitable Result (KER Nº11) Best practices guidelines for trauma bonding identification protocol		Leader
Description	Trauma bonding is a societal problem which simply refer to two people bonding over a difficult or painful experiences. It is when a person who is or has been abused feels a connection to their abuser. NGOs role is more of providing assistance for trauma bonding cases. For example, there are organizations who offer assistance 24 hours a day, seven days a week through their hotlines. The proposed solution is Breaking the trauma bonding which is challenging but it is possible. The victim of trauma bonding can learn about abusive relationships in order to spot the signs early and reinforced that they are not healthy; learn what healthy relationship and seek them out; and create a plan to improve safety and make it possible to leave.	CWCS
Type/ Format	Guideline	
Potential Users/ Stakeholders/ Market	Health professionals, and NGOs.	
Benefits for users	Health professionals, especially mental health care professionals need to know how to handle survivors of trauma bonding. NGOs need to know the risk factors and reactions to trauma bonding because they are the ones who can assist the victims by providing their services round the clock and they are able to find a support group or to contact a mental health professional.	
Competitors	Those who are doing research on trauma bonding.	
Potential impact	**Society:** The potential impact will be that people will have clear conception of about trauma bonding and also know the ways that it harms survivors.	

	Victims of child abuse and human trafficking – Children: will be able to relate their abusive relationship in the family. Victims of human trafficking will be able to recognize trauma bonding and will try to break such bonds. **Law enforcement agencies:** Will be able to identified trauma bonding which has developed between the abused persons and abuser. They will also know about the four attachment styles, risk factors, and the persons who are vulnerable to trauma bonding. NGOs and civil society: Will have conceptual clarity of the term trauma bonding, signs and symptoms, on what should be victims centered, right based approach while interacting with victims of trauma bonding, risk factors, people who are vulnerable to trauma bonding, consequences of trauma bonding and what assistance they can provide for trauma bonding cases, especially the breaking up and recovery.	

Table 17: KER N°11 - Training curricula on recognizing, intervening, and preventing various forms of sexual violence

Key Exploitable Result (KER N°12) **Training curricula on recognizing, intervening, and preventing various forms of sexual violence**		**Leader**
Description	The result is the creation of tailored learning methodologies, training curricula, and materials to address the specific needs of key stakeholders involved in preventing, responding to, and caring for victims of Child Sexual Exploitation and Abuse (CSEA) and Trafficking in Human Beings (THB). The problem lies in the limited accessibility of such training, which is often not public, not free, and available in limited languages. The proposed solution involves leveraging the expertise of ICMEC to offer comprehensive training programs, with a focus on specific countries identified based on the number of Child Sexual Abuse Material (CSAM) reports.	ICMEC CH
Type/ Format	Report	
Potential Users/ Stakeholders/ Market	• Law Enforcement Agencies and specialised units, • Policymakers and government bodies, • Prosecutors, judges, lawyers, child advocates, • NGOs related to children's and victims/survivors' rights, support and wellbeing, • Medical professionals, for both physical and mental health, • School teachers and educators, • Social workers, • Parents and guardians/carers, • The communication and technology industry, especially related to social media, gaming, banking, e-learning, among others, • The travel and tourism industry, including hotels and accommodations providers, transport, entertainment such as bars and clubs, etc., • Any adult with a duty of care towards children, including sport coaches, religious and community leaders, shelter homes and detention centres for children, and all those in a position of power and trust.	
Benefits for users	Professionals and adults with a duty of care to children alike will learn how to better prevent, respond to, and care for, victims of child sexual abuse and exploitation, and trafficking in human beings, through attending the training sessions listed in the deliverable.	
Competitors	Competitors are any other training providers, from UN agencies like UNICEF or UNODC, to other NGOs such as WeProtect, Child Helpline International and others. Some of them (such as UN agencies) are more recognised internationally, but the majority of the training providers only focus on professional stakeholders, and might not open their training to non-professional audiences who might still benefit from learning how to prevent and deal with CSEA and THB, such as parents, carers, and adults with a duty of care to children.	
Potential impact	**Society:** Learn how to better prevent, respond to, and care for, victims of child sexual abuse and exploitation, and trafficking in human beings, through attending the training sessions listed in the deliverable. As a result, the whole of society is better aware of the issues, and how to deal with them. **Victims:** Though the training, the adults around them are better able to prevent abuse from happening, or spot and react when abuse is happening or has happened. Victims are better cared for and the abuse can stop earlier, and survivors can heal.	

	LEAs: LEAs are one of the target groups of some of the training. They are better prepared to understand the potential reasons why some victims and offenders are involved in these crimes, and take a child rights, victim-centric approach to ensure victims are caed for appropriately. **NGOs:** Similarly, CSOs have a better understanding of the issues and how to concretely fight against them. The different training courses offer factual ways in which NGOs and other CSOs can work to prevent these crimes, care for victims, and support the investigation and assistance to victims in the healing process.	

Table 18: KER Nº12 - Guidelines of awareness and victim's assistance resources addressing to governments and stakeholders to follow on investigation and prosecution

Key Exploitable Result (KER Nº13) **Guidelines of awareness and victim's assistance resources addressing to governments and stakeholders to follow on investigation and prosecution**		**Leader**
Description	International best practices point out to the need of Multidisciplinary Teams (MDTs) to better care for victims of CSEA and other forms of abuse, and support in the proper investigation, medical and legal care and healing process. However, building an MDT is not straightforward and necessitate a strong will, collaboration, and clear structure and resources dedicated. The protocol developed by ICMEC CH provides a framework to set up or strengthen these MDTs to ensure that they are efficient and respond to all the needs identified. The protocol is tailorable so that it can perfectly fit the needs of any country or organisation willing to develop an MDT.	ICMEC CH
Type/ Format	Protocol	
Potential Users/ Stakeholders/ Market	Any country or organisation (NGO, LEA, medical facility, etc.) willing to create, or strengthen, an MDT.	
Benefits for users	An MDT at country level ensures an efficient national response to CSEA and other types of abuse, in a way that better protects and cares for victims and prevent revictimisation. When a country doesn't have the resources or political will to do so, individual institutions or organisations can decide to create an MDT at their level, working across disciplines to group professionals together around a case. The protocol is supporting them in doing so.	
Competitors	MDT protocols and frameworks exist usually at organisational or (more rarely) at national level, but there is no exact competitor as ICMEC could not find a protocol that was tailorable and usable at international level. One similar framework is being developed by ISCPAN but it has not yet been published, and will be quite brief and work more like a checklist (bullet points).	
Potential impact	**Society**: has the tools to create an MDT team which is a key part of an all-encompassing and victim centric response of CSEA crimes and other crimes against children. **Victims**: are better cared for thanks to the sent up of MDTs, and have an easier path to justice and healing while not being re-victimised. **LEAs:** LEAs' investigations are rendered easier by the strong collaboration with all necessary stakeholders such as victim advocates, medical professionals, the justice system, etc. Similarly, NGOs and more generally CSOs can more directly support victim's access to justice and healing while working with the key stakeholders.	

Table 19: KER Nº13 - E-learning-based training programs for passenger transport personnel addressing to identification and assistance possible THB and CSA/CSE victims

Key Exploitable Result (KER Nº14) **E-learning-based training programs for passenger transport personnel addressing to identification and assistance possible THB and CSA/CSE victims**		**Leader**
Description	Although there is some training available, there is space for accessible and engaging training of transport personnel for the purposes of sensitising them to, understanding, and	TRI

	being able to see the identifiers of trafficking in human beings. This result has created e-learning for that purpose.
Type/ Format	E-learning
Potential Users/ Stakeholders/ Market	Transport industry
Benefits for users	At the industry level: for combatting trafficking in human beings, for compliance with modern slavery legislation At the individual level: for better understanding of and responses to possible cases of trafficking.
Competitors	This training is distinct in its use of methods to engage users, in particular its use of (i) multimedia, (ii) creative exercises based on inquiry-based learning methods, (iii) narratives, (iv) material on obstacles to reporting.
Contributing deliverables	D5.2 Passenger transport personnel addressing to identification and assistance possible THB victims elearning- based training programs
Potential impact	**Society:** Greater awareness of THB amongst transport personnel. Measured through analysis of course uptake and post-course questionnaires **Victims of child abuse and human trafficking:** Transport workers can be among the most trusted people by ongoing victims of THB; greater awareness among them increases the chance that they will be able to escape from their situation. **Law enforcement agencies (LEAs):** Stronger engagement with the transport industry community in combatting THB. May be partly assessed through interviews with relevant LEAs. **Non-governmental organizations (NGOs) and civil society:** A resource that will complement their existing trainings. Most directly assessed through discussion with partner CSOs.

Table 20: KER Nº14 - Online THB and CSA/CSE prevention programs and to provide stakeholders with resources for prevention and response to neglect, CSA/CSE signals in child

Key Exploitable Result (KER Nº15) **Online THB and CSA/CSE prevention programs and to provide stakeholders with resources for prevention and response to neglect, CSA/CSE signals in child**		**Leader**
Description	Children face significant online threats like THB, CSA/CSE, and OCSEA. Despite the dangers, there's a pronounced lack of awareness among key stakeholders, including NGOs, educators, and law enforcement, about recognizing and addressing these issues. The proposed solution is to introduce an all-encompassing educational Guide that: Educates on relevant terminologies linked to online crimes against children. Targets adults frequently interacting with children, such as educators, law enforcement, and parents. Provides insights on online risks, early warning signs, and effective communication strategies with children. Ensures content is engaging, culturally appropriate, and globally accessible, with plans for diverse formats and languages to maximize reach. Development of a PDF Guide to be sent to relevant organisations and agencies, such as NGOs, Law Enforcement Units, social services centre, schools, etc., targeting, as a first stage, stakeholders in countries included in the HEROES Project. In the final year of HEROES, the Guide will be hosted on an interactive microsite that offers readers the choice of either downloading the guide as a PDF or navigating through it directly on the microsite when wanting access to a specific topic of interest.	ICMEC CH
Type/ Format	Report	
Potential Users/ Stakeholders/ Market	• Law Enforcement Agencies and specialised units, • Policymakers and government bodies, • Prosecutors, judges, lawyers, child advocates, • NGOs related to children's and victims/survivors' rights, support and wellbeing, • Medical professionals, for both physical and mental health, • School teachers and educators,	

	• Social workers, • Parents and guardians/carers, as well as any adult relatives, • The communication and technology industry, especially related to social media, gaming, banking, e-learning, among others, • The travel and tourism industry, including hotels and accommodations providers, transport, entertainment such as bars and clubs, etc., • Any adult with a duty of care towards children, including sport coaches, religious and community leaders, and all those in a position of power and trust.
Benefits for users	**Law Enforcement Agencies and specialized units:** Enhanced detection and prevention capabilities for online child-related crimes. Improved understanding of terminologies and trends related to online threats, enabling more effective investigations. **Policymakers and government bodies:** Informed decision-making for relevant legislation and policy development. Data-backed insights for structuring awareness campaigns and interventions. **Prosecutors, judges, lawyers, child advocates:** Comprehensive knowledge of the digital landscape where such crimes occur. Better understanding of victim psychology and the nuances of digital evidence. **NGOs related to children's and victims/survivors' rights, support, and wellbeing:** Empowerment with tools and information to aid victims and educate the public. Facilitation of partnerships with other stakeholders for joint initiatives. **Medical professionals, for both physical and mental health:** Insights into the psychological impact of online crimes, aiding in diagnosis and treatment. Enhanced patient care through understanding of the digital threats faced by children today. **School teachers and educators:** Effective strategies for teaching students about online safety. Awareness of signs indicating a student might be a victim of online exploitation. **Social workers:** Improved ability to detect potential online abuse cases during their interactions. Enhanced counseling techniques tailored to the unique challenges of online exploitation. **Parents and guardians/carers, as well as any adult relatives:** Tools and knowledge to protect their children from online threats. Improved communication strategies to discuss online safety with children. **The communication and technology industry, especially related to social media, gaming, banking, e-learning, among others:** Guidance on creating safer online environments. Reputation enhancement by showcasing commitment to online child safety. **The travel and tourism industry, including hotels and accommodations providers, transport, entertainment such as bars and clubs, etc.:** Training and awareness to prevent inadvertent facilitation of trafficking or exploitation. Building trust with consumers by ensuring child safety standards. **Any adult with a duty of care towards children, including sport coaches, religious and community leaders, and all those in a position of power and trust:** Confidence and capability to detect, intervene, and prevent potential online threats to children.

	Upholding their duty and responsibility towards child safety in an increasingly digital world.
Competitors	Other NGOs and Non-Profit Organizations: There are numerous NGOs worldwide that focus on child protection and online safety. They might have their own materials, campaigns, or training programs to combat online child exploitation. Tech Companies: Many tech firms develop safety tools, parental controls, and monitoring software to help parents and guardians keep children safe online. Educational Institutions: Schools and universities might offer curriculum or programs on internet safety and child protection. Law Enforcement Training Programs: Specialized training programs aimed at equipping law enforcement agencies to combat online child exploitation. Online Platforms and Forums: There might be online platforms or communities dedicated to discussing, raising awareness, and sharing resources on child protection online. Comparing with the proposed solution: this guide stands out because of its comprehensive approach, targeting a wide array of stakeholders, from law enforcement to educators to parents. Its international scope and attention to cultural sensitivity make it uniquely positioned to address the issue on a global scale. Moreover, the interactive microsite and multilingual availability further enhance its accessibility and reach. The emphasis on careful and sensitive communication regarding such a serious issue ensures that the guide is both impactful and respectful.
Potential impact	Society in General: A more informed society is likely to be more vigilant and proactive in protecting its most vulnerable members. By understanding the risks and signs of child abuse and human trafficking, the public can act as additional "eyes and ears" to identify potential threats and report suspicious activities. This heightened societal awareness can create safer environments for children. Assessment Strategy: Conduct surveys or research studies to understand the awareness levels and attitudes of the general public towards these issues before and after the deployment of the KER. Victims of Child Abuse and Human Trafficking: The KER can provide crucial information and resources to potential or existing victims, empowering them to seek help or report their situation. Knowledge about their rights and available support can be life-saving. Furthermore, a society that is more attuned to the signs can be quicker to offer aid to these victims. Assessment Strategy: Collate testimonials and feedback from beneficiaries about the usefulness and relevance of the KER. Law Enforcement Agencies (LEAs): LEAs can benefit from a more informed public that can serve as an auxiliary force, reporting suspicious activities. Furthermore, the KER can provide training resources or reference materials for officers, ensuring they are better equipped to handle and investigate cases of child abuse and trafficking. Assessment Strategy: Gather feedback from law enforcement personnel on the utility of the KER in their operations. Non-Governmental Organizations (NGOs) and Civil Society: NGOs can use the KER as a foundation for their awareness campaigns, outreach programs, and victim support services. It can serve as a standardized resource that ensures consistency in messaging and approach. Civil society groups can also leverage the KER to lobby for policy changes or additional support from governments and international bodies. Assessment Strategy: Evaluate the adoption and integration of the KER into NGO programs and campaigns. Measure the outreach and engagement metrics of campaigns built around the KER. Additionally, track any policy or funding changes influenced by the KER-driven advocacy.

Table 21: KER Nº16 - Training plan to health care workers and other child-serving professionals regarding THB and CSA/CSE

Key Exploitable Result (KER Nº15) **Training plan to health care workers and other child-serving professionals regarding THB and CSA/CSE**	**Leader**

Description	Multidisciplinary collaboration in the investigation of crimes against children has been recommended in multiple international directives, conventions and reports. The goals of collaboration in the response to THB/CSA/CSE include 1) ensuring children and families receive services that meet their holistic needs; 2) improve the quality of criminal investigations of THB/CSA/CSE and promote successful prosecution of offenders; 3) enhance the quality of evidence identified/gathered for civil litigation; and 4) increase public awareness of THB/CSA/CSE and appropriate strategies for seeking victim assistance. However, multidisciplinary collaboration is not a given, and demands knowledge, resources, and a clear structure. The training illustrates the benefits of collaboration, familiarises professionals with the protocol developed and helps them begin the process of adapting the framework to meet the needs of their community. It helps stakeholders organize their protocol development process and addresses key issues for consideration. Like the framework, itself, the training provides a scaffolding to support the work of professionals as they strive to improve the response to suspected THB/CSA/CSE.	ICMEC CH
Type/ Format	Report, Training	
Potential Users/ Stakeholders/ Market	MDT professionals involved with the victim care, investigation, path to justice and healing.	
Benefits for users	The training will help them implement the protocol and understand the importance of multidisciplinary collaboration, in order to provide a better response to victims of CSEA and other crimes.	
Competitors	ICMEC is not aware of any similar training courses specifically targeting the setting up or strengthening of MDTs.	
Potential impact	Society is working more collaboratively to better respond to CSEA and other similar types of abuse. Victims are better cared for and less re-victimised throughout the investigation, justice, and healing process. Investigations are more efficient and provide a stronger rationale to claim justice. Moreover, LEAs are less at risk to re-victimise victims and survivors. NGOs are strengthened to participate in MDTs and can more concretely support victims to access justice, retribution and healing.	

7. Exploitation Planning

This section presents a preliminary version of the HEROES exploitation plan. These plans will be updated to ensure that the widest possible communication and dissemination of the results generated by the project can be achieved and will be presented in the final version of the Exploitation plan.

To develop the overall exploitation strategy for each KER, the project partners defined the general approach to foster the adoption of the result by stakeholders and end users. This process took into account several factors, such as the nature of the results, the type of exploitation (commercial or non-commercial), and whether the results will have a direct or indirect use. A review was also conducted to determine the means of dissemination, i.e., the channels through which the results will be available to potential users.

Each partner defined the messages to be promoted to the target audience, all those key aspects that potential users of the result should know about in order to be interested in using it, as well as the appropriate communication channels to deliver those messages to the target audience.

The following tables detail the exploitation plan for each KER.

Table 22: Antigrooming Exploitation Plan

Exploitation Plan Anti-grooming Mobile App (AGapp)		Leader
Partners involded	To ensure user acceptance and adoption of this tool, a friendly and intuitive interface was designed to make it easy to use. In addition to that, a manual will be made to explain in detail the functionality of each component. When antigrooming application is officially launched in the official Android app store (Google Play), publications will be made in social networks and on the HEROES project website, to increase the visibility of the tool, make it reach the target audience and attract more users.	UCM
Overall exploitation strategy	The application will be available for free in the Play Store, open to the general public.	
Dissemination means	**Child safety:** "Protect your child from online threats! Our application actively detects and prevents bullying situations, ensuring a safe digital space for children". **Real-time protection:** "Receive instant alerts and protect your child in real time! Our app keeps you informed and empowered, allowing you to respond quickly to any potentially harmful messages." **User-friendly interface:** "Easy, intuitive and designed with you in mind. Our app's user-friendly interface makes it easy for parents and guardians to monitor and protect their children online." **Privacy preservation:** "Your child's privacy is important. Our app processes offline data, encrypts sensitive content, and uses federated learning to enhance without compromising personal information." **Collaboration with law enforcement:** "Be a digital guardian! Our app goes beyond protection: it collaborates with law enforcement. Report potential crimes and help create a safer online community." **Free accessibility:** "Safety shouldn't come at a price! Download our free app on Play Store and enjoy comprehensive online protection at no cost."	
“Messages” to promote to target audience(s)	Scientific publications, social networks and HEROES project website, events and conferences	
Communication channels to use for promotion to target audience(s)	To ensure user acceptance and adoption of this tool, a friendly and intuitive interface was designed to make it easy to use. In addition to that, a manual will be made to explain in detail the functionality of each component.	

	When antigrooming application is officially launched in the official Android app store (Google Play), publications will be made in social networks and on the HEROES project website, to increase the visibility of the tool, make it reach the target audience and attract more users.	

Table 23: ACPIC Exploitation Plan

Exploitation Plan Automatic CSAM/CSEM Identification and Classification Tool (ACPIC)		Leader
Partners involded	INRIA, UCM	INRIA
Overall exploitation strategy	This tool analyze a media file (image or video) by detecting and tracking people per frame and providing an accurate prediction of their age and gender. At the same time, sensitive adult content is detected and if a minor is present during it, the media is flagged as CSAM/CSEM. A caption summarizing the context is provided to help the investigations and make connection between media files.	
Dissemination means	Software made available open source and a stand-alone app. Scientific publication for the modules separately	
"Messages" to promote to target audience(s)	- Accuracy of the tool - Automatic processed against manual check time	
Communication channels to use for promotion to target audience(s)	Web page and presentation at events with demonstration	

Table 24: Citizen Reporting App Exploitation Plan

Exploitation Plan Citizen Reporting App (CR)		Leader
Partners involded	UNIKENT	UNIKENT
Overall exploitation strategy	Not defined yet. The support and acceptance of LEAs and NGOs is needed before proceeding with a concrete exploitation strategy.	
Dissemination means	Presenting the proposed solution (including the potential infrastructure required) to LEAs within the consortium. The software solution will be made available to LEAs and select NGOs to start with.	
"Messages" to promote to target audience(s)	Not defined yet.	
Communication channels to use for promotion to target audience(s)	Not defined yet.	

Table 25: File Context Analysis from Seized Devices Exploitation Plan

Exploitation Plan File Context Analysis from Seized Devices (FCA)		Leader
Partners involded	UCM	UCM
Overall exploitation strategy	The overall exploitation strategy focuses on encouraging adoption of the result by law enforcement agencies, effectively communicating the practical benefits of this result. The approach involves highlighting the practical benefits of this tool to improve document analysis and information retrieval processes by these agencies. Specific demonstrations, training sessions and awareness campaigns will be carried out to demonstrate how this result contributes to streamlining document analysis and improving operational efficiency.	
Dissemination means	Software available open source. In addition, scientific papers will be published that describe the software, its characteristics and its implementation. These documents will be available online and accessible to the public.	

“Messages” to promote to target audience(s)	"Power your ability to get accurate and efficient information: our new software revolutionizes document analysis for law enforcement agencies." "Accuracy in Document Analysis." " Adapted to the Needs of the LEAs." "Open Source Accessibility." "User Friendly Interface."	
Communication channels to use for promotion to target audience(s)	This solution will be available on the servers of the LEAs. In addition, scientific papers presenting the software, its features and some details of its implementation will be published. These papers will be available online and accessible to the public.	

Table 26: Identifying Fake Job Offers Exploitation Plan

Exploitation Plan Identifying Fake Job Offers (INDOOR)		**Leader**
Partners involded	IDENER	IDENER
Overall exploitation strategy	Not defined yet	
Dissemination means	Software made available as stand-alone app based on subscription license or freenium model	
“Messages” to promote to target audience(s)	Find job offer fake automatically in no time	
Communication channels to use for promotion to target audience(s)	Presentation at conference and workshop. Social media.	

Table 27: Open Source Intelligence Tools Exploitation Plan

Exploitation Plan Open Source Intelligence Tools (OSINT)		**Leader**
Partners involded	ARC	ARC
Overall exploitation strategy	The idea is that this tool is used always in all cases to provide further inputs, thus it has to be easy to use. Monetization plans are to be discussed, but it could be a per query model basis or a monthly/yearly paid subscription. Initially a demo plan could be offered or some free-to-use queries to engage end users. Another option could be to have a version of the tool that only uses a subset of social media sources, and an advanced tool that uses all the potential and sources.	
Dissemination means	Publications, report made available on web page, software made available open source, software made available as part of a larger package with licence payment, software made available as stand-alone app based on subscription licence.	
“Messages” to promote to target audience(s)	Number of social media sources, capability to scan deep web, pricing of the services.	
Communication channels to use for promotion to target audience(s)	Social networks, leaflets, workshops, research publications and other forums in conjuction with the rest of HEROES tools.	

Table 28: P2P CSAM/CSEM Identification Tool (P2PT)

Exploitation Plan P2P CSAM/CSEM Identification Tool (P2PT)		Leader
Partners involded	UNIKENT	UNIKENT
Overall exploitation strategy	After discussion with LEAs and other stakeholders, we will explore (especially as a result of the use cases) appropriate exploitation strategies. By default, our exploitation plan is to develop a low TRL proof-of-concept that can be deployed within Europol first, while at the same time, can still be useful for other LEAs within the project.	
Dissemination means	Presenting our proposed solution (including the potential infrastructure required) to LEAs within the consortium. The software solution will be made available to LEAs within the consortium, though we will consider commercialisation route outside of Europe. Further logistics are still to be determined.	
“Messages” to promote to target audience(s)	Using this tool, we will find more offending CSEA materials (and criminals) in P2P networks, in comparison to existing tools.	
Communication channels to use for promotion to target audience(s)	Demos in Europol headquarter in The Hague, words-of-mouth (i.e. recommendations) between LEAs.	

Table 29: Profile/Content Generator (PCG)Exploitation Plan

Exploitation Plan Profile/Content Generator (PCG)		Leader
Partners involded	IDENER, UCM, ARC, UNIKENT	IDENER
Overall exploitation strategy	Not defined yet	
Dissemination means	Not defined yet	
“Messages” to promote to target audience(s)	Save time and manage more undercover profile	
Communication channels to use for promotion to target audience(s)	Presentation at conference, workshop or other type of event	

Table 30: Real-time Instant Messaging Application Content Acquisition Exploitation Plan

Exploitation Plan Real-time Instant Messaging Application Content Acquisition (RIMA)		Leader
Partners involded	IDENER	IDENER
Overall exploitation strategy	Not defined yet	
Dissemination means	Software made available as part of a larger package with licence payment or freenium model	
“Messages” to promote to target audience(s)	Save time Process conversation Detect new evidence	
Communication channels to use for promotion to target audience(s)	Presentation at conference, workshop or other type of event	

Table 31: Best practices guidelines for trauma bonding identification protocol Exploitation Plan

Exploitation Plan Best practices guidelines for trauma bonding identification protocol		Leader
Partners involded	CWCS	CWCS
Overall exploitation strategy	The guidelines for trauma bonding identification protocol has reviewed best practices being used for trauma bonding victims/ survivors. For example, it has elaborated the victim centered and child right-based approaches and ways to handle survivors of trauma bonding so that they can break the bond and recover from abuse.	
Dissemination means	The report can be available on web page so that it can be easily available to its users.	
"Messages" to promote to target audience(s)	Know the victims of trauma bonding and save them to end exploitation.	
Communication channels to use for promotion to target audience(s)	Web page, presentation at meetings, social media.	

Table 32: Training curricula on recognizing, intervening, and preventing various forms of sexual violence Exploitation Plan

Exploitation Plan Training curricula on recognizing, intervening, and preventing various forms of sexual violence		Leader
Partners involded	ICMEC CH, ICMPD, whole Consortium	ICMEC CH
Overall exploitation strategy	The new course currently in development as part of HEROES will be integrated into ICMEC's internationally recognized Agents of Change program on ICMEC's Online Learning Platform. To optimize the utilization of HEROES's resources and enhance the goals achievement, collaborative efforts with ICMPD and ICMEC colleagues are underway, with the approval of the EC, to incorporate the aforementioned course on Trafficking in Human Beings (THB) and the broader Consortium for the Technology course into ICMEC's established learning platform. This platform has successfully reached over 2,100 professionals, showcasing its effectiveness in addressing various aspects of combating crimes against children, including online and offline child sexual exploitation and abuse, child trafficking, sexual exploitation in the context of travel and tourism, among others. This figure represents a notable increase from the 1,700 reported in the previous year. The inclusion of the HEROES course aims to complement the existing offerings of the Agents of Change program while expanding the international visibility of HEROES. All courses are actively promoted on ICMEC's website, social media channels, email newsletters, and through word of mouth.	
Dissemination means	All courses are promoted on ICMEC's pages, social media, email newsletters, and through word of mouth. Partners will also be relied upon to disseminate information to their respective networks.	
"Messages" to promote to target audience(s)	For free, anyone can participate in most of the training offered (and translated) from experienced professionals to students looking to learn more about the field.	
Communication channels to use for promotion to target audience(s)	The dissemination will be done through social media, email newsletters, ICMEC page, ICMEC's network of partners and contacts, and word of mouth, which is a very efficient way to communicate in the field of children's rights. At events attended by ICMEC such as conference and training events (webinars, in person, etc.), the full training offer is also referenced to encourage knowledge sharing.	

Table 33: Guidelines of awareness and victim's assistance resources addressing to governments and stakeholders to follow on investigation and prosecution Exploitation Plan

Exploitation Plan Guidelines of awareness and victim's assistance resources addressing to governments and stakeholders to follow on investigation and prosecution		Leader
Partners involded	ICMEC	ICMEC CH
Overall exploitation strategy	The protocol is designed for professionals, so it will be mainly shared to specific email lists from ICMEC's international list of contacts. Moreover, Consortium partners will be asked to support in sharing to their national and international networks.	
Dissemination means	The protocol will be hosted on ICMEC's website and freely downloadable by anyone interested. Moreover, another activities of HEROES aims to train professionals on using the protocol, which will be another way to provide access and talk about it.	
"Messages" to promote to target audience(s)	The protocol, available in English and other languages at a later date, is made to be tailored and changed so that it can be as relevant to each country, institution and structure.	
Communication channels to use for promotion to target audience(s)	The protocol will be shared to a specific list of stakeholders and professionals. Moreover, an online training will be available to support professionals in using the protocol. The protocol will also be advertised on social media to showcase ICMEC's work within the HEROES project.	

Table 34: E-learning-based training programs for passenger transport personnel addressing to identification and assistance possible THB and CSA/CSE victims Exploitation Plan

Exploitation Plan E-learning-based training programs for passenger transport personnel addressing to identification and assistance possible THB and CSA/CSE victims		Leader
Partners involded	TRI	TRI
Overall exploitation strategy	Phase 1 (Dec 2023-Aug 2024): Network-building through progressive validation. Between now and summer 2024, the course will be progressively tested with more partners and it will be developed for a second jurisdiction in consultation with project partners. This testing and consultation will develop contacts who will be able to facilitate its promotion. Phase 2 (Sep 2024-Nov 2024): Launch. Public launch of the course online. Partners and contacts gathered in phase 1 will promote it. Phase 3 (For the reminder and beyond the project): The course forms the basis of more in-depth training that will be developed for and in consultation with key partners within the transport industry, as part of TRI's Programme in Human Trafficking.	
Dissemination means	The course will be freely available online, promoted by social media and other networks.	
"Messages" to promote to target audience(s)	THB is a large problem, and those in the transport industry play a part in addressing it.	
Communication channels to use for promotion to target audience(s)	Social media Presentation at conferences Commitment to further development	

Table 35: Online THB and CSA/CSE prevention programs and to provide stakeholders with resources for prevention and response to neglect, CSA/CSE signals in child Exploitation Plan

Exploitation Plan Online THB and CSA/CSE prevention programs and to provide stakeholders with resources for prevention and response to neglect, CSA/CSE signals in child		Leader
Partners involded	ICMEC CH	ICMEC CH
Overall exploitation strategy	To optimize the uptake and effectiveness of the HEROES Project Guide, an expansive and collaborative approach has been employed, harnessing the strengths of multiple entities, both from within the HEROES Consortium and beyond. Recognizing the multifaceted nature of the guide, aimed at an international audience spanning numerous stakeholder groups, the strategy leverages diverse expertise. While the HEROES Consortium brings vast and relevant experience, there are gaps that third-party agencies effectively bridge. The decision to collaborate with external partners accentuates the commitment to developing a comprehensive, precise, and universally accessible guide. Two distinct areas of external expertise were identified as being pivotal: Educational Expertise: To ensure the content of the guide resonates with both specialized stakeholders and the general public, a partnership was established with Childnet International, an NGO with a reputation for its pioneering efforts in online child safety. Their involvement ensures the guide's content is not only accurate but also digestible by a wide audience. Creative and Marketing Expertise: The aesthetics, presentation, and accessibility of the guide play a pivotal role in its reception. To this end, the creative agency, Human After All, was engaged. Their expertise ensures the guide is not only visually appealing but also navigable, enhancing user experience. Furthermore, their input in creating a robust promotional strategy aims to maximize the guide's reach. In essence, the overarching strategy centers on amalgamating the strengths of both internal and external entities to create a guide that is comprehensive, accessible, and effective. With the blessing of the European Commission Point of Contact, this collaborative endeavor seeks to rise above traditional confines, aspiring to make a tangible difference in the realm of online child safety.	
Dissemination means	The Guide will always be shared through the microsite, to enable tracking. This means that the PDF will not be shared as a single document, but interested stakeholders will be able to download it from the microsite.	
“Messages” to promote to target audience(s)	User-Friendly Interface: Pointing out the guide's dual availability – both as a downloadable PDF and an interactive microsite. This ensures accessibility and ease of use, catering to different user preferences. Educational Emphasis: Stressing the guide’s ability to serve as an educational tool. From correct terminology usage to recognizing signs of online abuse, it empowers its users with essential knowledge. Multilingual Offering: Highlighting the plan to offer the guide in multiple languages, ensuring its reach and applicability extends across language barriers. Interactive Tools: Mentioning the guide’s inclusion of interactive conversation starters and other tools that not only provide information but also facilitate dialogue and action. Wide Scope & Impact: Emphasizing that the guide isn't just a document; it's a movement. Its content will be the foundation for broader awareness campaigns, ensuring a wider societal impact. Relevance in the Digital Age: Highlighting the timeliness and relevance of the guide, given the increasing digital interaction of children, making online safety a paramount concern.	

Communication channels to use for promotion to target audience(s)	While the final strategy will be developed closer to the dissemination period, the Guide will be shared in the following ways: • ICMEC mailing list • HEROES mailing list • Other Consortium partners mailing list if acceptable to them, e.g.: through the Red Heart Campaign Network • ICMEC social media platforms • HEROES social media platforms • Potentially, ALUNA social media platforms • Other Consortium partners social media platforms • Link and references on relevant HEROES and other publications (e.g.: journal articles, online courses and in-person training, other campaigns, etc.)	

Table 36: Training plan to health care workers and other child-serving professionals regarding THB and CSA/CSE Exploitation Plan

Exploitation Plan **Training plan to health care workers and other child-serving professionals regarding THB and CSA/CSE**		**Leader**
Partners involded	ICMEC CH, Consortium partners to share to their networks.	ICMEC CH
Overall exploitation strategy	ICMEC will offer this training to the entire Consortium first, and then translate it and offer it to a wider audience of relevant stakeholders. The recordings will then be translated and shared. Specific stakeholders will be targeted and invited to take part in the training based on ICMEC's network of professionals, and HEROES partners' contacts.	
Dissemination means	The live webinars will be recorded and shared in different languages (subtitles) to relevant professionals. The recordings will then be hosted on ICMEC's website for easy accessibility.	
“Messages” to promote to target audience(s)	The training is an in-depth session to empower professionals to build a clear framework to work together as an MDT more efficiently, to better care for victims.	
Communication channels to use for promotion to target audience(s)	The training will be shared via email, mentioned on social media and in different in person and online events such as other training and conferences.	

8. Exploitation Schedule

In the process of maximizing the impact of each Key Exploitable Result (KER), an exploitation schedule has been developed that outlines the estimated start and end dates for the exploitation of each result. This approach provides a clear and detailed view of the time steps that each partner has established to achieve the specific exploitation objectives of its KER.

Each partner has defined the objectives it expects to achieve through the exploitation of its particular outcome. These objectives may range from increasing technological maturity to expanding the user base, to conducting courses and trainings, or specific goals linked to communication strategies. The diversity of objectives reflects the unique nature of each KER, the multidisciplinary nature of the HEROES consortium and the breadth of impact sought.

Furthermore, for each established objective, specific actions to be carried out as part of the exploitation plan have been detailed. These actions are not limited only to technical activities, but also address crucial aspects such as finalizing business plans, protecting intellectual property, obtaining necessary approvals, and communication activities essential for effective implementation.

In the table below, the exploitation schedule for each KER is presented in an organized and detailed manner, providing a clear view of the dates, objectives and planned actions.

Table 37: Exploitation Schedule

KER	Approximate date	Goal	Actions planned to achieve goal
Anti-grooming Mobile App (AGapp)	Start date of exploitation: end of 2024	The anti-grooming application aims to reduce the level of exposure of a minor to possible online grooming, allowing the user's privacy to be preserved and alerting the LEAs about a possible case for future investigation. The expected technological maturity scale (TRL) is TRL level 5 so that it can be tested in a real but controlled environment in order to make improvements to the development and enhance the functionalities.	**User Testing:** Conduct user testing to gather feedback on the usability of the application, identify potential issues and make necessary improvements. **Privacy Compliance:** Ensure that the application complies with relevant privacy regulations and standards, reinforcing your commitment to preserving child privacy. **Authorizations and Collaborations:** Seek necessary authorizations and collaborate with law enforcement agencies to facilitate a smooth integration of the app into their processes. **Communication Strategy:** Develop a comprehensive communication strategy to build awareness of the app. This includes leveraging social media and the HEROES project website. Documentation: Prepare detailed documentation, including user manuals and technical guides, to help users understand the features and functionality of the application. Public Launch: Coordinate the official launch of the app in the Google Play store, ensuring that it is easily accessible to the target audience.
Automatic CSAM/CSEM	Start date of exploitation: mid 2024	TRL 6	Developping an application which can be deployed on pilots site and fine tuning the

Identification and Classification Tool (ACPIC)			model of sensitive content detection with LEAs' datasets.
Citizen Reporting App (CR)	Not defined yet.	TRL 3	Potentially TRL3 (Experimental proof of concept) or TRL4 (Technology validated in lab), with validation by the LEAs who are part of the consortium.
File Context Analysis from Seized Devices (FCA)	Start date of exploitation: end of 2024	The context analysis tool will allow automatic analysis of the information contained in a seized device, allowing precise searches to be carried out and trying to reduce analysis time and human error. The expected technological maturity scale (TRL) is level TRL5 so that it can be tested in a real, but controlled environment in order to make improvements to the development and enhance the functionalities. The expected number of users are all LEAs that are part of the HEROES consortium.	Perform extensive testing in a controlled environment to validate the functionality and effectiveness of the tool. This will include simulated scenarios of cyber investigations and forensic analysis. Collaborate closely with LEAs to coordinate and execute testing, ensuring active participation and gathering detailed feedback on usability and performance. Develop training materials and user manuals to ensure effective adoption of the tool by LEAs. Provide ongoing technical support.
Identifying Fake Job Offers (INDOOR)	Start date of exploitation: end of 2025	At the end of the project (end of 2024) the TRL will be between 6 and 7. The objective will be use the next year to see the market interest in the KER while increase the TRL.	Technical actions: increase the number of languages available, automate the process of downloading job offer Non-technical actions: Join conferences and workshops where stakeholders assist regularly, have separate meetings with stakeholders
Open Source Intelligence Tools (OSINT)	Start date of exploitation: end of the project and subsequent months	In terms of TRL, will be provide a dockerised componen ready to be deployed. This means, according to our expectations, a TRL 7 or above.	Awareness and communication with targe stakeholders to show the tool. When the tool is available via demo and ensuring that there are no legal/ethical issues, we can provide a service so that users can test it.
P2P CSAM/CSEM Identification Tool (P2PT)	Start date of exploitation: July 2025	The developed tool is envisaged to have a low TRL. The targeted number of users, projected licensing revenues, or other objectives related to exploitation or communication strategies are to be determined later. We expect the number of users to include all specialised LEAs in the EU. Regarding licensing revenues, we do not envisage any revenues in the first 3 years of release, but we are hoping to add 1 LEA partner from outside EU per year after that.	Potentially TRL3 (Experimental proof of concept) or TRL4 (Technology validated in lab), with validation by the LEAs who are part of the consortium.

Profile/Content Generator (PCG)	Start date of exploitation: end of 2024	TRL6	This tool need to be tested by LEAs and improve it according their necessity it is difficult to define the next technical steps that can be done.
Real-time Instant Messaging Application Content Acquisition (RIMA)	Start date of exploitation: end of 2025	The ker will be at TRL 6-7 at the end of the project. The goal is to continue increasing the TRL level during the next years	Technical: Increase the number of languages and improve the GUI
Best practices guidelines for trauma bonding identification protocol	Start date of exploitation: end of 2023. End date: July 2024.	The expected goal with the exploitation of the best practices guidelines for trauma bonding identification protocol by the specified date is to establish a widely recognized and used protocol for identifying signs of trauma in victims of Child Sexual Abuse/Child Sexual Exploitation/Child Sexual Exploitation (CSA/CSE) and Trafficking in Persons (THB). The goal is to provide government officials, NGOs and health professionals with a tool to recognize the traumatic link in survivors, thereby improving victim assistance programs. The exploitation seeks to disseminate the protocol, ensuring its adoption and implementation in relevant sectors.	Awareness Campaigns: Design and carry out awareness campaigns aimed at professionals in government, NGOs and health professionals, as well as the general public. These campaigns will highlight the importance of identifying and addressing trauma bonds, presenting the protocol as an essential tool. Collaboration with Institutions and Organizations: Establish strategic collaborations with government agencies, NGOs and other institutions involved in assisting victims of CSA/CSE and THB. This involves presenting the protocol as a recommended practice and working together for its effective implementation.
Training curricula on recognizing, intervening, and preventing various forms of sexual violence	Start date of exploitation: end of 2023.	Get the following information from the professionals who download the protocol to understand reach: - Role of person downloading document - Their institution and country they are based in - Information regarding the protocol they plan to create (local vs national vs regional target audience; type of child violence addressed)	The protocol will be shared with relevant stakeholders, and information will be kept on who downloads it.
Guidelines of awareness and victim's assistance resources addressing to governments and stakeholders to follow on	Start date of exploitation: end of 2023.	Get the following information from the professionals who download the protocol to understand reach: - Role of person downloading document - Their institution and country they are based in	The protocol will be shared with relevant stakeholders, and information will be kept on who downloads it.

investigation and prosecution		- Information regarding the protocol they plan to create (local vs national vs regional target audience; type of child violence addressed)	
E-learning-based training programs for passenger transport personnel addressing to identification and assistance possible THB and CSA/CSE victims	Nov 2024 (for course launched and analysis of first tranche of users) 2025-2026 (for further development)	Goal 1: 100 unique users of the course Goal 2: partnership with industrial partner for co-creation of in-depth training on this model	Goal 1: Promotion through social media, partner networks, and TRI network around Programme on Human Trafficking Goal 2: Identification of and application to relevant project and commercial opportunities
Online THB and CSA/CSE prevention programs	End of 2023 - End of 2024	Engagement Metrics: Target to reach a minimum of +/- 1000 unique users across all platforms by the end of the exploitation period. Create an integrated feedback system, with the goal of receiving feedback from at least 10% of the users. This feedback will be crucial for further refinements and for understanding the guide's impact. Diversified Communication Strategies: - Web Presence: Launch and maintain a dedicated webpage for the guide that achieves 5000 page views by the end date. - Academic & Industrial Publications: Publish at least five articles in reputed journals or magazines detailing the guide's relevance, benefits, and findings. - Social Media: Achieve a combined total of 50,000 engagements (likes, shares, comments) across all specified social media platforms.	Obtaining Authorizations: Securing all necessary permissions and authorizations, especially if the KER involves data usage or collaborations with other organizations. Ensure compliance with all relevant regulations and standards, particularly if the KER involves user data or sensitive information. Communication Activities: Developing a comprehensive communication strategy, detailing the mediums and platforms through which the KER will be promoted. Engage in direct communication with key stakeholders, informing them of the KER's relevance and benefits. User Training and Support: Provide training sessions for users to ensure the correct implementation and maximization of the KER. Set up a support system to assist users with any technical or functional issues they might face. Continuous Monitoring and Feedback Loop: Develop a system to regularly collect user feedback and make necessary refinements to the KER based on that feedback. Monitor the performance and uptake of the KER continuously, making any adjustments as needed.
Training plan to health care workers and other child-serving professionals regarding THB and CSA/CSE	Summer 2024	Multidisciplinary professionals from at least half of the countries represented in the HEROES Consortium will participate in the 90-minute online training (live or via a recording) during the	A 90-minute online training session describing a trauma-informed, child-centred MDT approach and use of the "Framework for Multidisciplinary Collaboration on the Response to Child Sexual Abuse, Child Sexual Exploitation and Child Trafficking in Human Beings" to create an MDT protocol.

		course of the grant from the six countries in focus and beyond. Participants will demonstrate a statistically significant positive change in attitudes toward MDT collaboration, and an increase in knowledge of strategies for improving teamwork using a trauma-informed, child-centred multidisciplinary approach when addressing THB/CSA/CSE. (pre-vs. post-training survey) At least 30% of participants will report positive changes in collaborative multidisciplinary behaviour after the training (3-month follow up survey) At least 15% of participants will report positive changes in community multidisciplinary collaboration during the 3 months following the training (e.g., efforts to adopt one or more MDT strategies outlined in the framework) (3-month follow up survey)	Workbook summarising key points of the training and framework template and including group discussion exercises to assist stakeholders in making key decisions regarding protocol structure and functioning. Pre-, post-, and delayed-post surveys for program evaluation and impact Report summarising program implementation and evaluation.

9. Management of intellectual property rights

Intellectual property rights (IPR) management is an essential component in protecting and maximizing the value derived from the innovations developed in the HEROES project. This section provides a strategic overview of the approach taken to manage the IPR associated with the key exploitable results (KERs) generated during the development of the project.

Effective protection of intellectual property is not only essential to safeguard the investments and efforts devoted to the project, but also plays a key role in the exploitation of the results by partners and other stakeholders. This section will provide a detailed description of the strategies and measures adopted for the management of intellectual property rights, thus ensuring a sound basis for the successful exploitation of the HEROES project KERs.

To address issues related to intellectual property rights, the following should be taken into account:

- The nature of the knowledge and its perceived potential for exploitation.
- The owners.
- Identification of the Background (Pre-existing Knowledge) of the partners and the specific constraints and conditions for implementation.
- Ownership of the results
- Transfer of results
- Access rights to the Background and results

9.1. Results protection

Partners have the possibility of protecting their results once they have been generated through the various mechanisms for intellectual property protection available. The standard forms of protection we consider include:

- Industrial secret
- Patent
- Copyright
- Software License
- Industrial
- Open Source
- Trademarks
- Trade Secret

The choice of the most appropriate form of intellectual property protection, as well as the duration, depends on the results (e.g., whether it is a software, a manual, a protocol), the business plans for its exploitation and the legitimate interests of the consortium.

Detailed information on the intellectual property rights associated with the Key Exploitable Results (KER) of the project is presented in the following table:

Table 38: Intellectual Property Rights

Intellectual Property Rights (IPR) Information					
KER	**Ownership**	**Restrictions on use of background during project and/or for exploitation**	**Access rights to results during project**	**Access rights to results after project**	**IPR protection mechanisms to apply outside/after project**
Anti-grooming Mobile App (AGapp)	UCM	No restrictions	No restrictions	No restrictions	Open Source
Automatic CSAM/CSEM Identification and Classification Tool (ACPIC)	INRIA, UCM	There is no background that could restrict the exploitation	There are no restrictions to the use of the project between partners	There are no restrictions to the use of the project between partners	Open Source
Citizen Reporting App (CR)	UNIKENT	No restrictions	The results will be made public, but the solution will not be ready for general release until LEAs adoption.	No restriction to partners	Not defined yet.
File Context Analysis from Seized Devices (FCA)	UCM	No restrictions	No restrictions	No restrictions	Open Source
Identifying Fake Job Offers (INDOOR)	IDENER	No restriction. The only input necessary was a published dataset that has open license.	Use allowed only for work directly related to project activities	Requirement to pay a license fee for the use of the result at normal commercial terms	Software License
Open Source Intelligence Tools (OSINT)	ARC	No restrictions	Use allowed only for work directly related to project activities by all members. End users will be allowed to use it afterwards.	Not defined yet	Open Source
P2P CSAM/CSEM Identification Tool (P2PT)	UNIKENT	No restrictions	The tool will be restricted only to LEAs within the project.	The tool will be restricted only to LEAs within the project, plus licensing.	The IPR will be owned by UNIKENT, and shared with consortium members and the EU.
Profile/Content Generator (PCG)	IDENER, UCM, ARC, UNIKENT	No restrictions	Use allowed only for work directly related to project activities	Not defined yet	Software License

Real-time Instant Messaging Application Content Acquisition (RIMA)	IDENER	Some training has being done using confidential dataset	Use allowed only for work directly related to project activities	Not defined yet	Software License
Best practices guidelines for trauma bonding identification protocol	CWCS, ICMEC, VUB	No restrictions	Access rights should include use allowed only for work directly related to project activities.	Not defined yet	None needed
Training curricula on recognizing, intervening, and preventing various forms of sexual violence	ICMEC, ICMPD, APAV, RENACER	The material is owned by ICMEC. Otherwise, there are no specific conditions.	No restrictions	No restrictions	None needed
Guidelines of awareness and victim's assistance resources addressing to governments and stakeholders to follow on investigation and prosecution	ICMEC	The protocol is based on desk research, and the knowledge of one ICMEC CH colleague acquired after decades in the field, both as a medical doctor and as a trainer.	The protocol will be hosted on ICMEC's website. There will be no restriction.	The protocol will be hosted on ICMEC's website. There will be no restriction.	None needed
E-learning-based training programs for passenger transport personnel addressing to identification and assistance possible THB and CSA/CSE victims	TRI	No restrictions	Access rights to use our results commercially by other partners, shall be subject to fair compensation and a license agreement	Use allowed only for work directly related to producing results within the project, access rights might be subject to the signature of an NDA and license agreement at no cost	None needed
Online THB and CSA/CSE prevention programs	ICMEC CH	As of now, there are no discernible restrictions on the use of the background material, given that the guide is slated for publication via ICMEC platforms, with internal approvals already in place. It's noteworthy to mention that the visual aesthetics of the guide have been meticulously crafted by a renowned creative agency, ensuring the use of bespoke visuals and elements.	Prior to the guide's public release on the ICMEC platforms, access to its content and results is limited to project partners and relevant stakeholders directly	Given that the guide is intended to be made available to the public through ICMEC platforms, access to its results during the project will be open to all project	None needed

			involved in its creation and review. This restriction is in place to ensure the integrity of the content, maintain confidentiality, and prevent premature dissemination. Any partner wishing to use or reference the guide's content outside the direct scope of project activities must seek explicit approval from the designated authority overseeing the guide. This is to ensure consistency, accuracy, and adherence to the project's objectives before the guide reaches its wider audience.	partners. This is in line with the project's mission to disseminate crucial information widely. However, while the content is accessible, its application and any potential modifications or reproductions are to be carried out only with direct relation to project activities. Any other use or distribution outside of this scope would necessitate explicit permission from the designated authority overseeing the guide.	
Training plan to health care workers and other child-serving professionals regarding THB and CSA/CSE	ICMEC CH	The protocol is based on desk research, and the knowledge of one ICMEC CH colleague acquired after decades in the field, both as a medical doctor and as a trainer.	The recordings will be hosted on ICMEC's website. No restrictions.	The recordings will be hosted on ICMEC's website. No restrictions.	None needed

10. Horizon Results Booster

Horizon Results Booster [19] is a service available free of charge for all projects funded by the European Commission. The free services offered by HRB are in the areas of communication, dissemination and exploitation, and are provided by a Consortium of partners who have specific expertise in the field. We have contacted them to take advantage of the services they offer and to receive advice on the dissemination and exploitation plan to maximize the impact of the project results.

HRB offers a total of three services:

- **Dissemination & Exploitation Strategy**
  - Identifying and creating the portfolio of R&I project results
  - To design and execute a portfolio dissemination plan
  - Assisting the project to improve the existing exploitation strategy
- **Business Plan Development**
  - Guide and support in preparing the project result(s) for the market.
- **Go to Market**
  - To assist in making the project results ready for commercialisation.
  - Support to identify and/or address potential obstacles to the exploitation of project results and reach commercialisation.

Currently, with the joint work, module A (Dissemination & Exploitation Strategy) has been completed.

Among the main results obtained from this module are:

10.1. The Project Group

The first step of HRB Module A is to identify a number of projects that are relevant or have similarities with the HEROES project, in terms of focus, field of research and target audience

The HRB service identified that the ALUNA project shares several similarities with HEROES, and has therefore included it in the group of projects.

As a result, the HEROES project and ALUNA have been grouped under the name Prot-Act, focused on prevention and research of child abuse and exploitation, as well as victim assistance.

The project group main objectives:

- To use technology to improve the way in which help, and support can be provided to victims of human trafficking and child sexual abuse and exploitation.
- To establish new innovative strategies that in the short, medium, and long term will improve the way in which criminal investigations are carried out, rescued victims are assisted, and how to prevent the occurrence of these crimes.

10.2. Key results for dissemination

The Service Team has identified the following most relevant results as part of the Project Group's portfolio of research and innovation results.

Table 39: Key results for dissemination

Id	Result	Result Type	Project(s)	TRL	Delivery date
R1	Anti-grooming Mobile App (AGapp)	App	HEROES, ALUNA	5-Large scale prototype. Tested in intended environment.	11/30/2024 (HEROES) 05/31/2025 (ALUNA)
R2	Automatic CSAM/CSEM Identification and Classification Tool (ACPIC)	Tool	HEROES, ALUNA	5-Large scale prototype. Tested in intended environment.	11/30/2024 (HEROES) 05/31/2025 (ALUNA)
R3	Manual for early identification of potential victims of THB and of CSA/CSE	Manual	HEROES	1-Basic research. Principles postulated, no experimental proof available.	11/30/2024
R4	Citizen Reporting App (CR)	App	HEROES	5-Large scale prototype. Tested in intended environment.	11/30/2024
R5	Profile/ Content Generator (PCG)	Tool	HEROES	4-Small scale ("ugly") prototype. Built in a lab environment.	11/30/2024
R6	Creation of hotlines or portals for reporting child sexual abuse material in countries selected	Portal	ALUNA	5-Large scale prototype. Tested in intended environment.	05/31/2025

10.3. Stakeholder / target audience mapping

Stakeholders are those who will experience impact due to the operations, goals and results of the Project Group. For each project within the group, the HRB service performed a detailed classification of stakeholders, considering various aspects such as their geographic scope, domains, type of activity, interest in the results portfolio and level of influence.

The identification of Prot-Act's key stakeholders is presented below, organized in order of importance and relevance to the group's dissemination objectives.

Table 40: Stakeholder / target audience mapping

Stakeholder 1	
Description	Civil Society, NGOs, Citizens
Projects	HEROES, ALUNA
How stakeholders can benefit from the Project Group results	HEROES • Anti-grooming Mobile App (AGapp): Reducing grooming incidents. ALUNA • Creation of hotlines or portals for reporting child sexual abuse material in countries selected: Increase the volume of online CSA material detected and removed

Engagement to date	Neutral (Aware of projects yet neither supportive nor resistant) (HEROES) Unaware (Unaware of projects and potential impact) (ALUNA
Stakeholder 2	
Description	Law Enforcement Agencies
Projects	HEROES, ALUNA
How stakeholders can benefit from the Project Group results	**HEROES** • Automatic CSAM/CSEM: Identification and Classification Tool (ACPIC): Detecting CSAM. • Citizen Reporting App (CR): Identification and reporting of potential victims of THB and of CSA/CSE. • Profile/Content Generator (PCG): LEAs automatization undercover investigations. **ALUNA** • Anti-grooming Mobile App (AGapp): Reducing grooming incidents. App is including a reporting module for LEAs. • Automatic CSAM/CSEM Identification and Classification Tool (ACPIC): Detecting CSAM audio. • Creation of hotlines or portals for reporting child sexual abuse material in countries selected: Increase the volume of online CSA material detected and removed.
Engagement to date	Supportive (Aware of project & impacts and supportive to change) (HEROES) n/a (ALUNA)
Stakeholder 3	
Description	Policy makers, Funding Agencies including EU & national digital agencies
Projects	HEROES
How stakeholders can benefit from the Project Group results	HEROES Manual for early identification of potential victims of THB and of CSA/CSE: Early identification of potential victims of THB and of CSA/CSE
Engagement to date	Neutral (Aware of projects yet neither supportive nor resistant) (HEROES)

11. Conclusions

The outlined Exploitation Plan and strategy provide the basis for helping the consortium to understand and identify the exploitable results, the HEROES value proposition and exploitation activities. In addition, the Exploitation Plan has been created to serve as a framework to ensure the effective and efficient management of the activities for an optimal exploitation and protection of the results produced by the project.

As a living document, it will be updated as results become available to incorporate new exploitation strategies.

The plan will be reviewed particularly at the mid-term review and at the end of the project to evaluate and adapt the current strategy. The final plan will be presented at the M36 of the project and will set out the strategy, as the results will then be known.

During the half of the project, the exploitation and dissemination team will work together to ensure the quality of the promotional material. A second video describing the HEROES project will also be created to generate greater impact and visibility of the HEROES commercial product offer.

The final plan is expected to summarise the impact of the HEROES project on stakeholders and users and target users, but also on the wider community, in the fight against THB and CSA/CSE.

To ensure an optimal exploitation of the project results, the exploitable results have been identified, a roadmap has been established and the exploitable assets of the project have been identified in relation to the different modules of the HEROES project (Prevention, Investigation and Victim Assistance), as well as the vision of the individual exploitation plans of each partner that will lead to new opportunities to generate visibility of the HEROES exploitation results among the relevant stakeholder communities within LEAs and NGOs.

A comprehensive and strategic roadmap was developed for the identification, promotion and implementation of Key Exploitable Results (KERs). From the selection of KERs, the effective management of intellectual property, to the development of a comprehensive exploitation strategy and exploitation schedule, with the objective of generating a significant impact on stakeholders.

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