HEIDI Y2 exploitation, sustainability, and standardisation activities

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Author(s)	Rebeca I. García Betances (TREE)
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Author(s)

Name	Organisation	Name	Organisation
Rebeca García Betances	TREE		

Reviewers

Name	Organisation	Date
Julia Thaler	VIF	2024-08-19
Malte Probst	HRI-EU	2024-08-16

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1. Executive Summary

The HEIDI project is dedicated to ensuring the effective utilization and sustainability of its assets from the outset, with a detailed plan and roadmap outlined in deliverable D8.3. The HEIDI consortium is focused on achieving long-term sustainability of its results beyond the project's completion in August 2025, striving to deliver high-quality and innovative outcomes that enhance the project's exploitation potential. To achieve this, the consortium will prioritize the management of Intellectual Property Rights (IPRs) and clearly define the anticipated project assets, their uses, and the benefits to various target groups.

The present deliverable describes year two (Y2) of HEIDI's exploitation and sustainability work carried out under the framework of Task 8.2, led by TREE, towards exploitation and sustainability of the project's results after the end of the grant. This includes an update of the HEIDI exploitation tabled presented in deliverable 8.3 in M6 with a previous update in D8.7 (Y1 activities – M12). The deliverable also aims to provide a description of the HEIDI exploitation pathway, business strategy and sustainability activities as envisioned by consortium partners after two years of HEIDI activities.

The structure of the main sections of the deliverable is the following:

Section 3 presents the exploitation pathways that will be followed by consortium partners. Specifically, an individual exploitation analysis per partner, the foreseen activities beyond the project ending, the exploitation impact in the field and the exploitation analysis per KER is presented under this section. Furthermore, we have checked the baseline background IP which were previously presented in the CA with partners. Additionally, it is updated based on the current activities and outcome of the project.

Section 4 aims to provide an overview and update from previous deliverables of the main regulations and standards that should be taken into consideration for project exploitation of the outcomes. Furthermore, it presents more detailed information about the sustainability of project activities and outcomes after project end.

Finally, section 5 presents an update of the HEIDI exploitation table after the completion of Y2 activities.

Keywords: exploitation, sustainability, business strategy, regulatory landscape, exploitation impact.

2. Objectives

The primary objective of deliverable 8.8 is to report about the year two (Y2) exploitation and sustainability activities of HEIDI outcomes. As part of WP8, this objective complements HEIDI's main objectives 1 and 4 related to the development and demonstration of fluid, cooperative Human Machine Interface (HMI) solutions, the elaboration of recommendations for regulation, standardisation, and development of adaptive internal and external HMIs, respectively.

To reach this objective, we have prepared different questionnaires to collect information from the partners about exploitation pathways, IP background and foreground interests, exploitation obstacles/challenges, added value brought by HEIDI activities, exploitation focus, foreseen activities beyond the project, and exploitation impact in the specific field. Additionally, a questionnaire was distributed to provide the planned key envisage sustainability activities and the regulatory landscape needed for the exploitation of HEIDI assets. The questionnaires are presented in Annex I and Annex II, respectively. The information collected through these questionnaires was organized and discussed with all the partners in a workshop previous the delivery of the D8.8.

The current document is the Y2 report of HEIDI's exploitation activities and sustainability plan and will have a last update and improvement under WP8 during Y3 of the HEIDI project and presented in Deliverable 8.9 at the end of the project. Furthermore, inputs of recommendations for standardisation will be collected from Task 5.4 and will be used to promote HEIDI on relevant standardisation workgroups.

3. HEIDI Exploitation Pathways

3.1 Individual exploitation analysis per partner

In this section the individual exploitation analysis per partner is presented based on the information collected through the questionnaire prepared for that end (see Annex I). The information is presented by partner and focuses on the identification of the individual exploitation plans and strategies inside their organizations.

Reutlingen University of Applied Sciences (RUAS) Promote excellence in education and research.	
Business Model	Focuses on building capacity in education and research through regional and international collaboration. Ensures the circulation of knowledge and responsible research to benefit society.
Key Activities	• Conducting research to test and validate novel concepts. • Making research findings available to young researchers, the research community, the public, and industry.
Market and Source of Revenues	Reutlingen University is a public non-profit organisation with the ministry of science and education of the state of Baden Württemberg as the main source of funding. However, and to venture in new venues of research, collaboration with industrial and scientific partners is a further stream of revenue. Transfer of research results into small and medium sized companies is another goal.
Value Proposition	The value proposition of the university of applied science is to provide students with practical and firsthand education that prepares them for the labour market and enhance their experience through research in new fields and collaborations beyond the boundaries of their field. Reutlingen University provides excellent applied research infrastructures offering to investigate important research questions in important markets.
Exploitation obstacles/challenges	• Career development focuses on publications hinders securing assets through patenting. • Patents are university assets, not individual researchers', who may lack business acumen. • Collaboration with industrial partners often leaves exploitable results in the hands of the commissioner.
Added Value brought by HEIDI activities	RUAS will profit in HEIDI from insights on effective external HMIs (eHMIs) in the context of interactive behaviour understanding of road users, especially pedestrians. With enhanced close-to-real world simulation technology and perception capabilities new fundings in these important research areas will be gained.
Exploitation focus	Fruitful cooperation will be exploited with partners from the HEIDI project. We foresee further usage of the developed technology to attract new funding with research partners and focus on special needs of industry.

Swedish National Road and Transport Research Institute (VTI) Government-owned research institute.	
Business Model	Interested in advancing research knowledge and improving research equipment and procedures. Not involved in the commercial exploitation of products.
Key Activities	• Performing co-simulations scenarios between pedestrians and car drivers. • Detecting pedestrians' intentions using motion capture sensors. • Developing Human-Machine Interfaces (HMI) for interaction in simulators. • Creating HMI for pedestrians that show external HMI on passing vehicles.

	• Developing methodologies for evaluating fluid concepts in simulator/VR environments.
Market and Source of Revenues	Research bodies and government.
Value Proposition	VTI's value proposition is focused on advancing research knowledge and ensuring that new insights and lessons learned are effectively utilized to make well-informed decisions, by focusing on the improvement of research equipment and procedures.
Exploitation obstacles/challenges	• Ensuring the developed concept is broad enough to integrate several types of HMI solutions for fluid interaction concepts. • Including more pedestrians to be able to understand the concept of humans moving in groups.
Added Value brought by HEIDI activities	Post project we hope to be able to add other types of HMIs into the simulator and to also include interaction with other type of unprotected road users such as bicycles.
Exploitation focus	Add bicycle simulation to the co-simulation environment, but also additional traffic environment. In focus are the riskiest situations like crossings and areas with reduced mobility.

Marelli Automotive Lighting Reutlingen (MAR)
Sale of vehicle lighting products to OEMs.

Business Model	Engages in R&D to innovate and improve lighting technologies, focusing on new technologies, efficiency, adaptive lighting features, and safety enhancements.
Key Activities	• Creating feasible concepts (mechanical, optical, electronical) for external HMI that meet industrialization/manufacturing requirements. • Developing prototypes as part of HEIDI deliverables to increase awareness among OEMs and the general public. • Drafting regulatory frameworks and materials for responsible committees to include HMIs in automotive lighting regulations.
Market and Source of Revenues	MAR is globally active, with customers and plants in Europe, Asia, North America and Latin America. As stated above, main revenue comes from the sales of lighting equipment to OEMs.
Value Proposition	MAR delivers advanced lighting solutions that enhance safety, style, and the driving experience. High-performance LED technologies enable optimal brightness and clarity, providing brilliant visibility in all driving conditions creating a safer and more confident driving environment. With strong efforts on energy efficiency and sustainability, MAR products lead to reduced power and material consumption. Innovative features, such as adaptive lighting technology with high resolutions promote safer driving, with lighting in general being a key safety feature for all road users.
Exploitation obstacles/challenges	• Regulatory approval gap for novel lighting features like HMIs. • High risk for exploitation if regulations do not permit the additional use of dynamic lighting or become more restrictive.
Added Value brought by HEIDI activities	Research results support regulation activities, publication support acceptance of HMIs by public & OEMs, research creates framework how future products should be designed for safety increase and minimal distraction.
Exploitation focus	Dissemination of results in industry fairs, with OEMs to motivate widespread adaption / inclusion in future RFQs. Trigger trend to make communication elements a must-have element of vehicle lighting. Support drafting of ECE regulations to include communication displays.

Virtual Vehicle (VIF) Provider of research services and infrastructure.	
Business Model	Supports research activities through the provision of specialized services and infrastructure.
Key Activities	• Conducting research. • Developing software. • Integrating systems and demonstrating technology. • Organizing events. • Developing and applying evaluation methods.
Market and Source of Revenues	Publicly funded research projects (national and European), contract research, research funded by industry partners.
Value Proposition	VIF value proposition consists of a user-centred approach for the development of technology, enabling inclusive human-system integration in highly complex and interactive environments.
Exploitation obstacles/challenges	• Low maturity level of the developed technology. • Requires extensive research efforts and creation of dedicated testing and validation methodologies. • Need to create reference standards for safety and homologation for industry-level development. • Necessity to disseminate initial test results to engage potential partners for advancing technology maturity.
Added Value brought by HEIDI activities	The project provides VIF with competence and expertise on an emerging research topic with high potential for applications in the expanding market of automated driving.
Exploitation focus	VIF aims at establishing itself as a European pivotal centre for fluid human-machine interaction research. It is envisioned to create a network among academic and industrial partners to promote research on safety and usability of user-centred automated driving solutions.

University of Alcalá (UAH) Education, research, and technology transfer.	
Business Model	Aims to enhance its global position through increased research contracts with industry partners, focusing on high-impact projects, especially EU-funded ones. Emphasizes internationalization.
Key Activities	• Conducting research on explainable road users' behavioural models. • Providing hardware equipment for training required AI models. • Collaborating with industrial partners in the automotive sector for technology transfer.
Market and Source of Revenues	Registration fees from students in university degrees. Research contracts with industry and administration, including the EU.
Value Proposition	UAH provides added-value research services by means of experienced research groups worldwide recognized in the field of automated driving and intelligent vehicles. Some of UAH's researchers in this field are included in the 1% of the most influential researchers in the world according to the ranking elaborated by the University of Standford.
Exploitation obstacles/challenges	• Need for financial support for research and international patents.
Added Value brought by HEIDI activities	HEIDI will provide UAH with a boost in terms of road users' behaviour understanding and interactions with automated vehicles. This will allow UAH to increase their prestige in this research field and to increase their possibilities to attract further research funding from industry.
Exploitation focus	UAH will maintain the cooperation with HEIDI's partners using their own funding sources. In addition, UAH will seek new funding opportunities in national and international research programmes where the HEIDI's partners can continue their cooperation.

Bayerische Motoren Werke AG (BMW)
At the BMW Group, forward-looking technologies meet emotive products and individual customer care to create a unique overall experience. Electromobility, digitalisation and circularity are at the forefront of what we do.

Business Model	The BMW Group is the world's leading provider of premium cars and motorcycles and the home of the BMW, MINI, Rolls-Royce and BMW Motorrad brands.
Key Activities	• Conducting research. • Developing prototypes. • Validating concepts. • Integrating systems.
Market and Source of Revenues	The BMW Group has its main markets in China, North America and Europe. Selling and Financing Premium vehicles worldwide are the sources of revenue.
Value Proposition	BMW has a long history of research and development of vehicles. Not only in terms of series production, but a broad variety of technologies and processed to build prototypes in any context.
Exploitation obstacles/challenges	Continuing research and validation of concepts through user studies in realistic everyday driving situations after the project ends.
Added Value brought by HEIDI activities	HEIDI offers the opportunity to validate models and concepts originating from research in practice. HEIDI allows us to establish and strengthen collaborations with other project partners to develop interfaces, which can have a huge impact on the vehicle's sector and overcome certain boundaries given by the development strategy of a carmaker.
Exploitation focus	Continue our research on interactions between (automated) vehicles and functions deployed on the server side.

Honda Research Institute Europe (HRI-EU)
Part of Honda's Global Network of Research Institutes.

Business Model	Conducts advanced research in AI and intelligent systems. Focuses on early-stage research in robotics, ADAS, energy management, software systems, human-machine interfaces, and optimization. Provides new concepts and insights through collaborative projects.
Key Activities	• Conducting research. • Developing prototypes. • Validating concepts. • Integrating systems.
Market and Source of Revenues	HRI-EU is a non-profitable research institute with no direct markets.
Value Proposition	HRI-EU's contributions focus on research in the context of cooperative driving. This includes traffic situation analysis in complex scenarios, behaviour planning with multiple entities to find solutions beneficial for all parties, communication of behaviour recommendations to the ego driver as well as external participants via internal and external HMIs, as well as behaviour tracking to assess the impact of the communication to all parties. HRI-EU will conduct fundamental and profound research on these topics creating a general understanding of communication in traffic interactions and providing the knowledge to the public through the HEIDI project.
Exploitation obstacles/challenges	• Continuing research and validation of concepts through user studies in realistic simulator environments provided by project partners after the project ends.
Added Value brought by HEIDI activities	HEIDI allows us to do research on interactions between (automated) vehicles and other road users focusing on how AVs should communicate regarding behaviour uncertainty and acceptance by other road users. HEIDI offers the opportunity to validate models and concepts originating from

	research in practice. HEIDI allows us to establish and strengthen collaborations with other project partners.
Exploitation focus	Continue our research on interactions between (automated) vehicles and other road users to develop a general understanding of how the communication among them should work to create a transparent, trustworthy, and beneficial environment in which both AVs and human road users can safely interact with each other.

NISYS (NISYS)
Support for OEMs and Tier 1 suppliers in ADAS development and validation.

Business Model	Develops real-time prototype systems for driver testing and manages data for ADAS validation.
Key Activities	• Validating Advanced Driver Assistance Systems (ADAS). • Developing prototypes. • Developing and integrating Deep Neural Networks (DNNs).
Market and Source of Revenues	Prototype development for ADAS.
Value Proposition	NISYS is focussing on providing an efficient infrastructure for data and information transfer, firstly between the software and hardware components of the individual project partners in the test vehicle and secondly to external information sources or cloud computing.
Exploitation obstacles/challenges	• Building trust in the concept of data transmission among OEMs and Tier 1 suppliers. • Necessity of corresponding projects to build this trust after the HEIDI project is completed.
Added Value brought by HEIDI activities	HEIDI enables us to test and validate the data and information exchange with the technology used between several participants in a prototype vehicle. Furthermore, possible weak spots can be recognised, and additional requirements evaluated.
Exploitation focus	To increase the usage of the concept of data and information exchange in the first phase of prototype development to speed up the development process and offer additional possibilities (e.g. cloud computing)

Tree Technology S.A (TREE)
R&D-performing company dedicated to digital transformation services and solutions, providing information and communication technology solutions based on Big Data and Artificial Intelligence.

Business Model	We explore how advanced technologies can help our customers. Our technological expertise is focused on Big Data and Artificial Intelligence.
Key Activities	Under the HEIDI project, TREE is focused on providing their expertise to help the consortium plan and execute the exploitation of the project KERs.
Market and Source of Revenues	Big Data and Artificial Intelligence. R&D innovation projects and collaborations/agreements with national and international organizations.
Value Proposition	Our value proposition includes leveraging advanced technologies and agile methodologies to help organizations enhance their IT capabilities and drive innovation. Their services range from R&D in innovative tech to practical IT solutions, aimed at optimizing business processes and decision-making.
Exploitation obstacles/challenges	N/A since TREE is not the owner of any development produced by HEIDI activities.
Added Value brought by HEIDI activities	New connections and interactions with leading organizations and standardization bodies coming from the necessary interactions to set the dissemination, exploitation and standardization activities of the HEIDI project.
Exploitation focus	Impulse and guide project partners to plan and execute the exploitation of HEIDI assets.

3.2 Foreseen activities beyond the project ending

The following table presents the foreseen activities beyond the project ending to achieve impact in the specific field of the HEIDI project, based on partners contributions through the questionnaires and the WP8 meetings and workshops. The information presented includes the foreseen activities and how these activities will be carried out (i.e., the funding sources and the institutional mechanism and type of personnel involved).

Partner	Foreseen activities beyond the project	Funding sources	Institutional mechanism and type of personnel
RUAS	• Participating in an EU AI call with partners from HEIDI. • Exploiting a larger infrastructure project for further testing similar technology. • Demonstrating technology transparently through community participation. • Using a new large-scale infrastructure project for AI data production for further testing of HEIDI aspects during and beyond the project. • Utilizing several presentation opportunities for sustainable visibility.	Own resources, other research and infrastructure projects at RUAS.	***Technical Staff***: Supports the hardware necessary to maintain the software systems developed by HEIDI. ***Administrative Staff***: The Reutlingen Research Institute supports participation in future research proposals. ***Research Staff***: Cognitive systems group will supervise PhD theses along HEIDI's lines and facilitate communication with other research groups at RUAS.
VTI	• Integrating bicyclists as additional interactive road users. • Adding more critical scenarios where co-simulation is important.	Apply for externa funding from Governmental research funding organisations like Vinnova. We will also apply for interna grants aimed to develop our research platforms.	***Researchers and/or Developers***: Work at simulators.
MAR	• In the first year after HEIDI: Developing a wider range of HMI prototypes for different car segments, considering price, size, and mounting heights. • Expecting requests for products by European OEMs in the second year after HEIDI.	Predevelopment projects paid by customers are planned for customer specific prototypes. General concept prototypes will be funded by own resources.	***Innovation Department***: Initially handles further development activities. ***Engineering Department***: Gradually takes over development activities from the innovation department.
VIF	• Organizing yearly meetings called the “Fluid Human-System Interaction Symposium” to promote visibility of developed systems and solutions.	Other R&D projects, own resources.	***Human Factors Researchers***: Collaborate with simulation and engineering researchers. ***International Organizations for Safety***

	• Presenting the latest research results and applications at the symposium. • Providing quarterly updates on social media and newsletters to the partners' network.		***Testing***: Work with EuroNCAP.
UAH	• Participating in at least two EU-funded calls in the first two years after HEIDI to continue research activities. • Participating in scientific and industrial workshops to present advanced results achieved in the HEIDI project.	Own resources. Other R&D projects at UAH.	***Technical Staff***: Supports the hardware necessary to maintain the software developed by HEIDI. ***Administrative Staff***: Supports participation in future research proposals. ***Research Staff***: The INVETT research group supports the supervision of PhD theses along HEIDI's lines.
BMW	• Setting a base for interfaces in production vehicles. • Continuing development of functions only on the server side.	Own resources.	***Various Departments***: Allocation of more resources if further projects are granted.
HRI	• Disseminating acquired knowledge within academia through continued research publications and PhD thesis.	Own resources.	***Research Staff***: Continues research on the topic, presents research results at scientific conferences, and integrates project results into the institute's long-term research.
NISYS	• In the first year after HEIDI: Talking to potential customers to support planned prototype and series developments. • Evaluating customer-specific requirements and developing implementation concepts together with the customers.	Pre-development projects for prototypes paid for primarily by customers are planned.	***Existing Employees***: Continue working on the foreseen activities. ***New Employees***: Recruited for customer-specific requirements.
TREE	• Participating in at least two EU-funded calls in the first two years after HEIDI to continue research activities.	Own resources.	***R&D Project Managers***: working on identify and produce new opportunities to continue research activities in this area.

3.3 Exploitation impact in the field

Overall, HEIDI partners will generate significant impact by disseminating their research through publications and conferences, engaging in future R&D projects with commercial partners, contributing to the development of industry standards, and strengthening their research networks and collaborations. This multifaceted approach will ensure that the outcomes of the HEIDI project have a lasting influence on both the academic and industrial sectors. The following are the main impacts by area and the mechanisms though which the HEIDI consortium will generate them.

Academic/Educational Impact:

- *Publication of Journal Articles*: All partners will increase their academic impact by publishing research findings in top-rated journal articles.
- *Participation in Conferences and Workshops*: Partners will actively participate in international conferences and workshops to present their research results and engage with the scientific community.
- *Knowledge Transfer*: Through collaboration in future relevant projects, partners will transfer knowledge and update educational curricula, enhancing the academic environment.
- *Supervision of PhD Theses*: Academic partners will support the supervision of PhD theses aligned with the project's research.

Commercial/Business Impact:

- *Future R&D Projects*: Collaboration with commercial partners in future R&D projects will drive innovation and application of research outcomes.
- *Cooperation with OEM Customers*: MAR and other commercial partners will cooperate with OEM customers, focusing initially on premium carmakers and later on generalist carmakers.
- *Standards Development*: Partners like MAR and VIF will contribute to the development of standards through participation in working groups and committees, ensuring that research results influence industry regulations and practices.

Policy and Standardization:

- *Contribution to Standards Development*: Partners will participate in standardization organizations and policy-making groups to contribute to the development of new standards based on their research findings, influencing industry practices and regulations.

Network and Collaboration:

- *Strengthening Research Collaborations*: By intensifying collaborations with existing and new research partners, including universities and other institutions, partners will create a robust network for ongoing and future projects.
- *Expanding Scientific Networks*: Participation in HEIDI will help partners extend their scientific research networks, fostering future collaborations and interdisciplinary research opportunities.

3.4 Exploitation analysis per KER

After collecting the general information to analyse more in detail the individual plans for the exploitation of HEIDI assets, we have asked the partners to provide their envisaged exploitation pathways focusing on exploitation plans and activities per KER. The following table presents the Key Exploitable Results identified and presented in deliverable 8.3.

Key Exploitable Result (KER)	Short Description	Partners	WP
Osmotic Layer	Application Programming Interface (API) for the transmission of information via a wireless connection between the vehicle and the outside world.	BMW, NISYS	WP4
Fluid internal HMI (iHMI)	Concept for adaptive vehicle interface based on driver's state monitoring	BMW, NISYS, VIF	WP2
Fluid external HMI (eHMI)	An external HMI which can react adaptively to the different road users and will communicate to many groups (or only specifically one person out of a group) and may present more information.	MAR, RUAS, UAH	WP3
Integrated cooperative HMI with situation assessment, resolution, and decision module	Software system providing recommendation of optimal coordinated behaviour for driver and outside participants via iHMI and eHMI	VTI, RUAS, HRIEU, VIF	WP4
Situation resolution and tracking module	Algorithm that continuously evaluates behaviour of driver and outside participants, compares it to a recommended best joint behaviour and communicates deviations and criticality of deviations	HRIEU	WP4
Sensing & behavioural predictive models for ego-driver	Algorithms that detect driver's distraction and predict driver's intentions	VIF, UAH	WP2
Sensing & behavioural predictive models for pedestrians	Recognition of adult pedestrians and children pedestrians; recognition of pedestrian behavioural features and prediction of most likely future behaviours	RUAS, UAH	WP3
Unique multi-user simulation with driver and pedestrians (co-simulation)	Networked driving and pedestrian simulators of multi-user experiments	VTI, RUAS, HRIEU	WP5
Standardisation, ethical guidelines, and human-centred methodology	Catalogues targeting standardisation, ethical guidelines, and human-centred methodology coming from project activities, evaluation and produced know-how.	ALL	WP5

The HEIDI consortium will put together the exploitation interests per asset including information of the willingness of doing a commercial exploitation of the asset, the exploitation goal including:

- **Non-commercial**: new working line, new collaborative research.
- **Commercial, Internal**: new product, process or service internally marketed. How will you exploit it? (Selling the product directly, via supplier, service provider, etc.)
- **Commercial, External**: new product, process or service externally marketed (granting license to a 3rd party, transferring the result, etc.)

as well as, the main external stakeholders that may benefit (described in section 3.2 of deliverable D8.3), and selection of the access rights to results or joint exploitation, including:

- **Transfer of your result:** Do you intend to transfer your contribution's ownership to another partner and not to exploit it yourself? To whom?
- **Access to another partner's result**: Would you like to have access to the contribution developed by another partner? Under which conditions?
- **Joint exploitation**: In case of a joint result, do you want to exploit a result jointly? Which are the necessary agreements with the other owners of the result?

The following tables presents the information collected organized by KER and providing the information of all the parties involved in the design and development of the KER.

KER 1 - Osmotic Layer (BMW, NISYS)	
Application Programming Interface (API) for the transmission of information via wireless connection between the vehicle and the outside world.	
Commercial exploitation? Sustainable exploitation?	Long term: Yes. 2029+
Exploitation goal (e.g. Non-commercial; Commercial, Internal; or Commercial, External)	Non-commercial: internal use. Commercial external: services.
Exploitation Model	• Prototype development, Cloud Computing. • Scientific publications and a proof of concept of the product.
Main external stake holders (see Annex III for reference)	A, B, D, E, F
Access rights to results or joint exploitation (e.g., transfer of your results; access to another partner's result; joint exploitation; or no access will be provided)	Access rights to background if needed for exploitation of another party's own results shall be granted on fair and reasonable conditions. Access rights to results are granted on reasonable terms if they are necessary for another party's own results.

KER 2 – Fluid internal HMI (iHMI) (BMW, NISYS, VIF)	
Concept for adaptive vehicle interface based on driver's state monitoring.	
Commercial exploitation? Sustainable exploitation?	Long term: Yes. 2029+
Exploitation goal (e.g. Non-commercial; Commercial, Internal; or Commercial, External)	Non-commercial: knowledge acquisition. Commercial external: new service for internal multi-modal HMI evaluation in simulation.
Exploitation Model	Network-based, media dissemination, research contribution to R&D projects and services.
Main external stake holders (see Annex III for reference)	A, B, D, E
Access rights to results or joint exploitation (e.g., transfer of your results; access to another partner's result; joint exploitation; or no access will be provided)	Access right to the background knowledge of other parties not envisioned. Access rights to results are granted on reasonable terms if they are necessary for another party's own results.

KER 3 - Fluid external HMI (eHMI) (MAR, RUAS, UAH)	
An external HMI which can react adaptively to the different road users and will communicate to many groups (or only specifically one person out of a group) and may present more information.	
Commercial exploitation? **Sustainable exploitation?**	Internal exploitation to support our current research lines. Partners will exploit in a sustainable way HEIDI results to foster research along its research line and are committed to sustainable development of products, considering eco-friendly materials, energy efficient designs and possibility to repair products.
Exploitation goal (e.g. Non-commercial; Commercial, Internal; or Commercial, External)	Commercial internal.
Exploitation Model	• New scientific research with partners and similar stakeholders will be steered by the outcome and insights of the project. • eHMIs of different complexity are established in the market as a Lighting product enhancing road user safety. Thus, they become a sought-after part of MAR product portfolio. • Leverage the developed knowledge to support further research applications and PhD Theses.
Main external stake holders (see Annex III for reference)	A, B, C, D, E, F.
Access rights to results or joint exploitation (e.g., transfer of your results; access to another partner's result; joint exploitation; or no access will be provided)	Joint research development and access to results from partners will be analysed for exploitation.

KER 4 – Integrated cooperative HMI with situation assessment, resolution, and decision module (VTI, RUAS, HRIEU, VIF)	
Software system providing recommendation of optimal coordinated behaviour for driver and outside participants via iHMI and eHMI.	
Commercial exploitation? **Sustainable exploitation?**	No. Focus on further challenging research aspects.
Exploitation goal (e.g. Non-commercial; Commercial, Internal; or Commercial, External)	Non-commercial. To be included in further research services, raise interest of related entity towards the project itself but also towards the developed technologies; Leverage the developed knowledge to support further research applications.

Exploitation Model	• Exploit new research insights in novel ways, to support new opportunities for PhD thesis and projects. • Scientific publications and a proof of concept of the application.
Main external stake holders (see Annex III for reference)	A, B, D, E and F.
Access rights to results or joint exploitation (e.g., transfer of your results; access to another partner's result; joint exploitation; or no access will be provided)	• Joint further exploitation of research. • Access rights to background if needed for exploitation of another party's own results shall be granted on fair and reasonable conditions.

KER 5 – Situation resolution and tracking module (HRIEU)	
Algorithm that continuously evaluates behaviour of driver and outside participants, compares it to a recommended best joint behaviour and communicates deviations and criticality of deviations.	
Commercial exploitation? Sustainable exploitation?	No
Exploitation goal (e.g. Non-commercial; Commercial, Internal; or Commercial, External)	Non-commercial - raise interest of related entity towards the project itself but also towards the developed technologies; Leverage the developed knowledge to support further research applications.
Exploitation Model	• Scientific publications and a proof of concept of the application.
Main external stake holders (see Annex III for reference)	A, B and D.
Access rights to results or joint exploitation (e.g., transfer of your results; access to another partner's result; joint exploitation; or no access will be provided)	Access rights to background if needed for exploitation of another party's own results shall be granted on fair and reasonable conditions.

KER 6 – Sensing & behavioural predictive models for ego-driver (VIF, UAH)	
Algorithms that detect driver's distraction and predict driver's intentions.	
Commercial exploitation? Sustainable exploitation?	Internal exploitation to support our current research lines.
Exploitation goal	Non-commercial. To be included in further research services, raise interest of related entity towards the project itself but also towards the

(e.g. Non-commercial; Commercial, Internal; or Commercial, External)	developed technologies; Leverage the developed knowledge to support further research applications.
Exploitation Model	Leverage the developed knowledge to support further research applications and PhD Theses.
Main external stake holders (see Annex III for reference)	D and E.
Access rights to results or joint exploitation (e.g., transfer of your results; access to another partner's result; joint exploitation; or no access will be provided)	Joint further exploitation of research and technology between VIF and UAH.

KER 7 – Sensing & behavioural predictive models for pedestrians (RUAS, UAH)	
Recognition of adult pedestrians and children pedestrians; recognition of pedestrian behavioural features and prediction of most likely future behaviours.	
Commercial exploitation? Sustainable exploitation?	No, only internal exploitation to support our current research lines.
Exploitation goal (e.g. Non-commercial; Commercial, Internal; or Commercial, External)	Non-commercial, Internal.
Exploitation Model	Leverage the developed knowledge to support further research applications and PhD Theses.
Main external stake holders (see Annex III for reference)	D and E.
Access rights to results or joint exploitation (e.g., transfer of your results; access to another partner's result; joint exploitation; or no access will be provided)	Joint research development between RUAS and UAH.

KER 8 – Unique multi-user simulation with driver and pedestrians (co-simulation) (VTI, RUAS, HRIEU)	
Networked driving and pedestrian simulators of multi-user experiments.	
Commercial exploitation? Sustainable exploitation?	No, focus on further challenging research aspects.
Exploitation goal	Non-commercial - Leverage the developed knowledge to support further research applications.

(e.g. Non-commercial; Commercial, Internal; or Commercial, External)	
Exploitation Model	Exploit new research insights in novel ways, to support new opportunities for PhD thesis projects and technology advancements.
Main external stake holders (see Annex III for reference)	D and E.
Access rights to results or joint exploitation (e.g., transfer of your results; access to another partner's result; joint exploitation; or no access will be provided)	Joint further exploitation of research and technology between RUAS, VTI and HRIEU.

KER 9 – Standardisation, ethical guidelines, and human-centred methodology (ALL)	
Networked driving and pedestrian simulators of multi-user experiments.	
Commercial exploitation? Sustainable exploitation?	Standardisation drafts which will hopefully lead to regulation are the prerequisite.
Exploitation goal (e.g. Non-commercial; Commercial, Internal; or Commercial, External)	Commercial.
Exploitation Model	Public exploitation through standardisation bodies.
Main external stake holders (see Annex III for reference)	C, D, E.
Access rights to results or joint exploitation (e.g., transfer of your results; access to another partner's result; joint exploitation; or no access will be provided)	Standardisation must be public.

4. Background IP update

The aim of this section is to provide an update, if needed, of the information related to the Background IP provided for the HEIDI project by each partner. The information related to the Background identified and described during the preparation and sign of the HEIDI Consortium Agreement (CA) (see Annex 1 of HEIDI CA for reference) was use as a base for consortium partners to update, if needed, they access rights to the background.

According to the Grant Agreement (Article 16.1) **Background** is defined as "*data, know-how or information (…) that is (…) needed to implement the Action or exploit the results*". Because of this need, Access Rights have to be granted in principle, but Parties must identify and agree amongst them on the Background for the Project. This is the purpose of this attachment.

The following are the received updates of the Background IP presented in the CA. The specific updates are highlighted in Green. The updates received by partners do not represent any conflicts with the previous agreements set in the CA and GA.

PARTY 7

As to **Universidad de Alcalà**, it is agreed between the Parties that, to the best of their knowledge, the following Background is hereby identified and agreed upon for the Project. Specific limitations and/or conditions, shall be as mentioned hereunder:

Describe Background	**Specific restrictions and/or conditions for implementation (Article 16.4 Grant Agreement and its Annex 5, Section "Access rights to results and background", sub-section "Access rights to background and results for implementing the Action")**	**Specific restrictions and/or conditions for Exploitation (Article 16.4 Grant Agreement and its Annex 5, Section "Access rights to results and background", sub-section "Access rights for exploiting the results")**
Road Users' Trajectory Prediction AI-based system for predicting the trajectories of road users, as presented in the IEEE Intelligent Vehicles Symposium 2021	Access Rights to any source code related to this software component is subject to a prior specific research agreement.	Any source code related to the software components will not be transferred for exploitation purposes
Vehicle Lane Change Prediction System AI-based system for predicting lane changes on highways, as presented in IEEE Intelligent Vehicles Symposium 2019 and 2020.	Access Rights to any source code related to this software component is subject to a prior specific research agreement.	Any source code related to the software components will not be transferred for exploitation purposes
Pedestrian Crossing Intention Prediction System AI-based system for predicting the crossing intentions of pedestrians, as presented in IEEE Intelligent Vehicles Symposium 2020	Access Rights to any source code related to this software component is subject to a prior specific research agreement.	Any source code related to the software components will not be transferred for exploitation purposes

The foreground IP will be discussed and defined during Y3 activities of WP8 and will be presented in deliverable D8.9 at the end of the project together with the final IP management of the HEIDI project.

5. Regulatory landscape update and Sustainability

5.1 Regulatory landscape

It is crucial for the HEIDI project to ensure compliance with the relevant regulations in the markets they operate in. These regulations aim to ensure that HMI systems do not compromise driver safety, minimise driver distraction, and maintain the overall integrity of the vehicle's safety features. The regulatory landscape related to HMI systems and vehicle safety standards varies across different regions and countries. The following table, presented in D8.7, provided a preliminary summary of the main key aspect to consider while taking into consideration the regulatory landscape in different countries / regions:

Table 5-1: Regulatory landscape for HEIDI assets in different countries/regions.

Region / country	Regulations
United States	***National Highway Traffic Safety Administration (NHTSA)***[1]: The NHTSA sets and enforces vehicle safety standards in the United States. They have guidelines for driver distraction and in-vehicle electronic devices to ensure that HMI systems do not compromise driver safety.
	Federal Motor Vehicle Safety Standards (FMVSS)[2]: FMVSS regulations cover various safety aspects of vehicles, including crashworthiness, occupant protection, and vehicle equipment. Compliance with FMVSS standards is mandatory for vehicles sold in the U.S.
European Union	***United Nations Economic Commission for Europe (UNECE)***[3]***:*** The UNECE develops international standards, regulations, and type approval procedures for vehicles, including safety and HMI-related aspects.
	European Union Vehicle Safety Standards[4]: The EU has established vehicle safety standards, including regulations on driver distraction, to ensure HMI systems do not impair driver attention and safety
Japan	***Ministry of Land, Infrastructure, Transport and Tourism (MLIT)***[5]: MLIT is responsible for vehicle safety standards in Japan. They have regulations related to driver distraction and HMI systems to maintain safety standards.
Other Countries	Different countries have their own regulatory bodies and standards for vehicle safety and HMI systems. For example, Canada has regulations established by Transport Canada, while China has guidelines set by the Ministry of Industry and Information Technology (MIIT).

In addition to these regional regulations, there are also global initiatives and collaborations focusing on vehicle safety and HMI systems, such as those led by the United Nations and its affiliated organizations. For example, the World Forum for Harmonization of Vehicle Regulations (WP.29)[6] develops international standards and regulations for vehicle safety and emerging technologies.

[1] https://www.nhtsa.gov/
[2] https://www.nhtsa.gov/laws-regulations
[3] https://unece.org/
[4] New rules to improve road safety and enable fully driverless vehicles in the EU https://ec.europa.eu/commission/presscorner/detail/en/ip_22_4312
[5] https://www.mlit.go.jp/en/
[6] https://unece.org/transport/vehicle-regulations/world-forum-harmonization-vehicle-regulations-wp29

The IEEE 2846 standard, *IEEE Standard for Assumptions in Safety-Related Models for Automated Driving Systems*[7], dealing with Advanced Driver Assistance Systems (ADAS) development for adaptive human-like driving style is also taken into consideration when defining and developing the overall HEIDI concept and interfaces.

An important regulation to take into consideration for HEIDI activities is the new EU Artificial Intelligence Act ("AI Act")[8], formally adopted in the European Parliament on March 13, 2024, to regulate the *use of artificial intelligence in the EU*. This new regulation will be addressed by consortium partners during the activities of Y3 and in conjunction with T5.1 – Ethical guidelines and procedures – making discussion sessions with HEIDI's Ethical Advisor and in a general view during our meetings with the Advisory Board. Conclusions will be presented on D8.9 at the end of the project.

5.2 Sustainability activities

In previous deliverables (D8.3 and D8.7) we presented the sustainability strategy of the HEIDI project including the necessary steps to enable the sustainability of project activities and assets. These steps include: (i) the identification of the outcomes to be sustained; (ii) the identification of resources required; (iii) the identification of main use cases; (iv) the IPR identification for the defined assets; and (v) the definition of future funding strategies or synergies with other related projects, grant organisations, and or networks.

During Y2, we have worked in the identification and definition of points ii, iv and v, together with consortium partners. Partners provided their ideas, plans and opinions about the sustainability of the HEIDI outcomes through a questionnaire (see Annex I) where questions related potential key sustainability activities and actions are necessary to fulfil HEIDI's vision by the end of the project and after, the resources needed to implement those activities, the obstacles that may be faced by HEIDI consortium towards fulfilling its vision, and recommendations on how the activities can be supported or facilitated by the HEIDI approach and results.

5.2.1 Key sustainability actions necessary to fulfil HEIDI's vision by the end of the project

To fulfil HEIDI's vision, key sustainable actions from partners include setting ambitious efficiency targets for resource optimization and energy efficiency, maintaining transparent communication with stakeholders, conducting life-cycle assessments to minimize environmental impact, engaging the public for acceptance and involvement, ensuring commercial feasibility through cost-effective measures, and coordinating technology roadmaps. Additionally, developing and utilizing simulators and prototypes, aligning project outcomes with stakeholder needs, and disseminating research and innovations are crucial for achieving lasting sustainability and broad adoption of HEIDI's goals.

5.2.2 Resources needed to implement the actions

To implement the actions provided by partners, the necessary resources include financial and legal support for sustaining networks and research demonstrators (RUAS), human and

[7] https://standards.ieee.org/ieee/2846/10831/

[8] https://www.europarl.europa.eu/topics/en/article/20230601STO93804/eu-ai-act-first-regulation-on-artificial-intelligence

intellectual resources (VTI, BMW, HRI), and independent sustainability resources (MAR). Additionally, agreements for the use of simulators and prototypes beyond project completion (UAH) are essential. Prototyping and integration efforts require dedicated intellectual resources and facilities for effective research and development (BMW, HRI). Some partners do not require additional resources (VIF, NYSIS).

5.2.3 Main obstacles faced by HEIDI

According to HEIDI consortium the main obstacles faced by HEIDI towards fulfilling its vision are the following:

- Fusion and effectiveness demonstration of different HMIs.
- Delayed public acceptance and slow regulation updates.
- Segmentation of stakeholders.
- User acceptance and effective communication of minimal, useful, and unequivocal HMI information.
- Missing regulations hindering HMI/ADAS technology adoption.
- Complexity and testing requirements of HMI/ADAS concepts in real environments.
- Effective research communication due to the fast pace and large amount of research.

5.2.4 Recommendations concerning initiatives or activities

Partners recommend several initiatives and activities for the HEIDI project. The following are the recommendations:

- Identify effective regimes for fluid HMI operations to support standardization.
- Participate in "plugfest" events for integration and validation by all owners and developers.
- Participate in European public events related to C-ITS and CCAM initiatives.
- Make contacts with standardization bodies in automotive HMIs that would benefit from HEIDI's results.
- Find and participate in national or international initiatives focused on increasing road safety.

6. Update HEIDI exploitation table (M24)

RESULT						BACKGROUND		EXPLOITATION INTEREST				IP (RESULT PROTECTION)	
Key Exploitable Result (KER)	**Description**	**Partner**	**Other owners of the result**	**Type of result (commercial/non commercial)**	**WP**	**Background IP in which the result is based**	**Access Rights to background**	**Do you want to do a commercial exploitation? Will you do a sustainable exploitation?**	**Exploitation goal**	**Main external stakeholders that may benefit**	**Access Rights to result OR Joint exploitation**	**Expected TRL for this outcome**	**Do you want to protect the results in IP terms?**
Osmotic Layer	Application Programming Interface (API) for the transmission of information via a wireless connection between the vehicle and the outside world.	BMW, NISYS		non-commercial and commercial	WP 4			BMW: yes (long-term 2029+)	BMW: Parts non-commercial and internal; parts commercial and external. Scientific publications and a proof of concept of the product. NYSIS: Non-commercial: internal use; commercial: services. Prototype development, Cloud Computing.	A, B, C, D, E, F	Access rights to results are granted on reasonable terms if they are necessary for another party's own results.	TRL 5	

Fluid iHMI	concept for adaptive vehicle interface based on driver's state monitoring	BMW, NISYS, VIF	VIF is the owner of the original concept	non commercial results: knowledge, know-how; scientific publications. Commercial: service for evaluation of internal and coordinated hmi in simulation and real vehicles.	WP 2	See Consortium Agreement (chapters 8,9, annex 1-party 1)	access right to the background of other parties not envisioned	no	Non-commercial: knowledge acquisition; commercial external: new service for internal multi-modal HMI evaluation in simulation. Network-based, media dissemination, research contribution to R&D projects and services.	A, B, D, E	Access right to other parties not envisioned.	TRL 6	No
Fluid eHMI	An external HMI which can react adaptively to the different road users and will communicate to many groups (or only specifically one person out of a group) and may present more information.	MAR, RUAS, UAH		RUAS & UAH: non-commercial: internal use. MAR: commercial: internal.	WP 3			no; RUAS will exploit in a sustainable way HEIDI results to foster research along its research line. MAR: considering eco-friendly materials, energy efficient designs and possibility to repair products.	RUAS & UAH: New scientific research with partners and similar stakeholders will be steered by the outcome and insights of the project. MAR: eHMIs of different complexity are established in the market as a Lighting product enhancing road user safety. Thus they become a sought after part of MAR product portfolio.	A, B, C, D, E, F	RUAS: Joint research development with MAR and UAH. UAH: Joint research development with VIF. MAR: Access to results from partners will be beneficial for exploitation.	TRL 6	

Integrated cooperative HMI with situation assessment, resolution, and decision module	software system providing recommendation of optimal coordinated behavior for driver and outside participants via iHMI and eHMI	VTI, RUAS, HRIEU,VIF		non commercial results: knowledge, know-how; scientific publications. Commercial: proof-of-concept of product	WP 4	HRI-EU: Background IP around cooperative Risk Modelling	Access Rights to Background if Needed for Exploitation of another Party's own Results, shall be granted on Fair and Reasonable conditions.	no; Focus on further challenging research aspects.	HRI-EU: Commercial, Internal - pitch functionality to be included in future automotive products of related entity; Scientific publications and a proof of concept of the product.RUAS: Exploit new research insights in novel ways, to support new opportunities for PhD theses projects.	A, B, D, E, F	Joint further exploitation of research with e.g. BMW, NISYS, and HRIEU.	TRL 4	
Situation resolution and tracking module	algorithm that continuously evaluates behavior of driver and outside participants, compares it to a recommended best joint behavior and communicates deviations and criticality of deviations	HRIEU		non commercial results: knowledge, know-how; scientific publications.	WP 4	Background IP around cooperative Risk Modelling	Access Rights to Background if Needed for Exploitation of another Party's own Results, shall be granted on Fair and Reasonable conditions.	no	HRI-EU: Commercial, Internal - pitch functionality to be included in future automotive products of related entity; Scientific publications.	A, D		TRL 5	

Sensing & behavioural predictive models for ego-driver	algorithms that detect driver's distraction and predict driver's intentions	VIF		non commercial results: knowledge, know-how; scientific publications. Commercial: service for evaluation of internal hmi and driver's state real vehicles.	WP 2	See Consortium Agreement (chapters 8,9, annex 1-party 1)	access right to the background of other parties not envisioned. Bilateral agreement may be possible		non commercial; commercial external: new service for driver monitoring systems	A, D, E		TRL 6	
Sensing & behavioural predictive models for pedestrians	Recognition of adult pedestrians and children pedestrians; recognition of pedestrian behavioural features and prediction of most likely future behaviours	RUAS, UAH		Research results: prototypes for experimentation on real vehicles; research publications.	WP 3	Perception system for pedestrian detection and action recognition	All partners are granted access to background in the framework of HEIDI	no;	RUAS & UAH: internal exploitation to support research lines.	A, D, E	The system will not be available to stakeholders outside the HEIDI consortium. The scientific publications will be open to the scientific community. Joint research development between RUAS and UAH.	TRL 6	No

Unique multi-user simulation with driver and pedestrians (co-simulation)	Networked driving and pedestrian simulators of multi-user experiments	VTI, RUAS, HRIEU	None	Input to new research, Standardization, Knowledge know-how	WP 5			No	Non-commercial: new collaborative research. Exploit new research insights in novel ways, to support new opportunities for projects and technology advancements.	D, E	The multi-user simulation infrastructure will not be available to stakeholders outside the HEIDI consortium. The scientific publications will be open to the scientific community. RUAS: Joint further exploitation of research and technology with e.g. HRIEU, VTI.	TRL 5	No
Standardisation, ethical guidelines, and human-centred methodology	Catalogues targeting standardisation, ethical guidelines, and human-centred methodology	ALL	N/A	Standardization documents which will hopefully lead to regulation are the prerequisite.	WP 5			no	Non-commercial.	C, D, E	Standardisation must be public.		

7. Conclusion

Deliverable D8.8 presents the second-year report of the exploitation, sustainability and standardisation activities related to the work carried out within WP8 of the HEIDI project. The HEIDI exploitation pathway was described providing more details regarding the individual exploitation plans, the foreseen activities beyond the project ending and the exploitation analysis per KER. In addition, the regulatory landscape related to the project outcomes was updated from previous deliverables, specially adding the new EU Artificial Intelligence Act ("AI Act") and the sustainable activities and actions necessary to fulfil HEIDI's vision. An update of the exploitation table at M24 is also being provided.

During the third and last year of the HEIDI project, the consortium will work towards providing the final details on the foreground IP, the assets ownerships, final agreements for access rights and protection of KERs, and the final exploitation roadmap after the end of the project. Furthermore, the cross-activity related to the recommendations for standardization of HEIDI results coming from T5.4, will be used to propose collaboration with standardization bodies that would benefit from HEIDI outcomes and produced knowledge and experience.

All these activities will be done by working in close collaboration with work package leaders, and the project partners through the instrument designed for that aim and during future internal workshop sessions under the activities of WP8.

8. Abbreviations

Term	Definition
ADAS	Advanced Driver Assistance Systems
AI	Artificial Intelligence
API	Application Programming Interface
AR	Augmented Reality
B2B	Business to Business
CA	Consortium Agreement
CACC	Cooperative Adaptive Cruise Control
CAGR	Compound Annual Growth Rate
eHMI	Fluid external HMI
EM	Exploitation Models
FAIR	Findable, Accessible Interoperable, and Reusable
FMVSS	Federal Motor Vehicle Safety Standards
GA	Grant Agreement
HEIDI	Holistic and adaptivE Interface Design for human-technology Interactions
HMI	Human-machine Interface
HUDs	Head Up Displays
iHMI	Fluid internal HMI
IP	Intellectual Property
IPR	Intellectual Property Rights
ITS	Intelligent Transportation Systems
KERs	Key Exploitable Results
LiDAR	Light Detection and Ranging
MLIT	Ministry of Land, Infrastructure, Transport and Tourism
NHTSA	National Highway Traffic Safety Administration
NLP	Natural Language Processing
OEMs	Original Equipment Manufacturer
PU	Public
R	Document, Report
R&D	Research & Development
SWOT	Strengths, Weaknesses, Opportunities, and Threats
TAM	Total Addressable Market
UCs	Use Cases
UNECE	United Nations Economic Commission for Europe
V2I	Vehicle-to-Infrastructure
V2V	Vehicle to Vehicle
WP	Work Package
Y	Year

ANNEX I - HEIDI Exploitation and Sustainability questionnaire

Introduction

The following questionnaire is part of the activities defined in HEIDI's Exploitation Plan under task *T8.2 Exploitation, Sustainability, and Standardisation of Project Results*. **The objective** is to collect the necessary information from Project Partners regarding the exploitation activities, including the individual exploitation, the exploitation plan per KER, and the envisage sustainability activities planned. The information collected through this questionnaire will be organized and discussed with all the partners in a workshop previous the delivery of the deliverable of *HEIDI Y2 exploitation, sustainability, and standardisation activities* (D8.8), where the results of this work will be included.

Instructions

The questionnaire is structured as follows:

- **Part 1** of the questionnaire focuses on the identification of the HEIDI individual exploitation plan at each partners' level, taking into consideration the identified exploitation assets (KERs).
- **Part 2** focuses on exploitation plans and activities per KER, from the point of view of each partner organization.
- **Part 3** is devoted to gather ideas and opinions from partners about the sustainability of the HEIDI outcomes.

Please fill in the tables and answer the questions in each part thinking always on the KER you have/will developed/adapted/improved during the HEIDI project. The questions refer to your plans (post-project) regarding the future development, commercialization, and exploitation of these results.

Key concepts

Project Results – Key Exploitable Results (KERs)

According to Article 16 of the GA,

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

The development of an **exploitation plan** is a mandatory process for projects funded by the European Union. This plan is expected to outline the strategies that both individual project partners and the consortium intend to employ in utilizing the research outcomes post-project completion. While certain partners may focus on enhancing their expertise or increasing their publication output, others may envisage specific exploitation paths grounded in well-defined business models.

Below, you can find the relevant provision provided by HEIDI GA (Article 16) regarding exploitation:

> *(a)* ***Beneficiaries*** *which have received funding under the grant must — up to four years after the end of the action (see Data Sheet, Point 1) — use their best efforts to exploit their results directly or to have them exploited indirectly by another entity, in particular through transfer or licensing.*

(b) If, despite a beneficiary's best efforts, the results are not exploited within one year after the end of the action, the beneficiaries must (unless otherwise agreed in writing with the granting authority) use the Horizon Results Platform to find interested parties to exploit the results.

(c) If results are incorporated in a standard, the beneficiaries must (unless otherwise agreed with the granting authority or unless it is impossible) ask the standardisation body to include the funding statement (see Article 17) in (information related to) the standard.

Sustainability

The sustainability strategy is designed to assist the consortium, in transitioning from the research results to a pre-commercial or commercial stage where reliance on EU funding is no longer required. In this phase, consortium partners are expected to have identify a way, such as through business models, to sustain project efforts and derive outcomes beyond the project's lifecycle, with the objective of ensuring project outcomes' long-term viability and sustainability.

Information from partner

Organization	
Contributors	
Position in the organization	

PART 1 - Individual exploitation

This section presents the Exploitation Plan of every project partner. The plan of each partner is presented in the context of the existing individual business model to identify the added value provided by HEIDI activities to partner's value proposition.

Q1. Partner Business Model - Provide a general description of your organization's core strategy.

Q2. List your Key Activities - What key activities do your organization require for the exploitation of HEIDI assets? (e.g. software development, research, etc.)

Q3. Which are the main Market and Source of Revenues of your organization?

Q4. Describe your organization Value Proposition (one/two paragraphs).

Q5. In your opinion, what are the main exploitation obstacles/challenges your organization may face?

Q6. Describe the Added Value brought by HEIDI activities - *Make visible the interests and goals on which you will focus post-project activities -*

Q7. Exploitation focus - Present the general idea of what you will do beyond the project ending to extend the impact of HEIDI and ensure the continuation of the activities initiated in the project.

Q8. List of foreseen activities - Present a list of activities and milestones (ideally with associated dates), e.g., 2nd year after the projects ending) that your organization will perform beyond the project ending to implement the exploitation strategy.

Q9. Considering the previous question, what funding sources will be used to do this (other R&D projects, Pre-commercial Procurement, own resources, etc.)?

Q10. What institutional mechanism and type of personnel will support the further development of HEIDI assets (depending on your internal organization, who will work on it? (e.g., a different unit, a new spin-off entity, etc.)?

Q11. How (through which mechanism) will your organization utilize to achieve impact in the field? Please explain. *Some relevant examples are*:

- *Research partners: Increase academic/educational impact through the publication of journal articles, participation in workshops, update of students' curricula, knowledge transfer through collaboration in future relevant projects…*
- *Commercial/Business partners: Cooperation in future R&D projects, contribution to standards development, etc.*

PART 2 - Exploitation activities per KER

HEIDI consortium will put together the exploitation interests per asset including information of the willingness of doing a commercial exploitation of the asset, the exploitation goal including:

- **Non-commercial**: new working line, new collaborative research.
- **Commercial, Internal**: new product, process or service internally marketed. How will you exploit it? (Selling the product directly, via supplier, service provider, etc.)
- **Commercial, External**: new product, process or service externally marketed (granting license to a 3rd party, transferring the result, etc.)

the main external stakeholders that may benefit (described in section 3.2 of deliverable D8.3), and selection of the access rights to results or joint exploitation, including:

- **Transfer of your result:** Do you intend to transfer your contribution's ownership to another partner and not to exploit it yourself? To whom?
- **Access to another partner's result**: Would you like to have access to the contribution developed by another partner? Under which conditions?

- **Joint exploitation**: In case of a joint result, do you want to exploit a result jointly? Which are the necessary agreements with the other owners of the result?

Please answer the following questions for each HEIDI result/outcome (KER) in which you participate, or your organization is the owner.

List of HEIDI identified KERs:

- **KER 1** - Osmotic Layer (BMW, NISYS
- **KER 2** - Fluid iHMI (BMW, NISYS, VIF)
- **KER 3** - Fluid eHMI (MAR, RUAS, UAH)
- **KER 4** - Integrated cooperative HMI with situation assessment, resolution, and decision module (VTI, RUAS, HRIEU, VIF)
- **KER 5** - Situation resolution and tracking module (HRIEU)
- **KER 6** - Sensing & behavioural predictive models for ego-driver (VIF)
- **KER 7** - Sensing & behavioural predictive models for pedestrians (RUAS, UAH)
- **KER 8** - Unique multi-user simulation with driver and pedestrians (co-simulation) (VTI, RUAS, HRIEU)
- **KER 9** - Standardisation, ethical guidelines, and human-centred methodology (ALL)

Copy and paste the following table for each KER your organization is involved. Remember that there is already some information provided at the beginning of the project for D8.3 (see Annex 3 of this questionnaire for reference).

KER - <name>
Q12. Do you want to do a commercial exploitation? Will you do a sustainable exploitation?
Q13. Exploitation goal (e.g. Non-commercial; Commercial, Internal; or Commercial, External)
Q14. Exploitation Model - Define the model of exploitation envisage for this outcome
Q15. Main external stake holders (see Annex 2 for reference)
Q16. Access rights to results or joint exploitation (e.g., transfer of your results; access to another partner's result; joint exploitation; or no access will be provided)

PART 3 - Sustainability activities

This section aims to collect information related to potential sustainability activities that may lead to additional exploitation ways and perhaps higher chances for post-project sustainability of results. An initial plan for sustainability is presented in deliverable D8.7 section 5.

Please answer the following questions:

Q17. In your opinion, what are the key sustainability actions necessary to fulfil HEIDI's vision by the end of the project (and after its end)?

Q18. Are there particular resources needed to implement the actions mentioned above? (e.g. material, human, and intellectual resources).

Q19. In your opinion, what are the main obstacles faced by HEIDI towards fulfilling its vision?

Q20. Would you have any recommendations concerning initiatives or activities whose goals and priorities can be supported or facilitated by the HEIDI results and approach?

ANNEX II - HEIDI Background update and Regulatory Landscape

Introduction

The following questionnaire is part of the activities defined in HEIDI's Exploitation Plan under task *T8.2 Exploitation, Sustainability, and Standardisation of Project Results*. **The objective** is to collect the necessary information from Project Partners regarding the exploitation activities, including background and regulatory landscape needed for the exploitation of HEIDI assets. The information collected through this questionnaire will be organized and discussed with all the partners previous the delivery of the deliverable of *HEIDI Y2 exploitation, sustainability, and standardisation activities* (D8.8), where the results of this work will be included.

Instructions

The questionnaire is structured as follows:

- **Part 1** of the questionnaire focuses on the check and update of the background information that we presented in the GA.
- **Part 2** focuses on the collection of national or EU legislations obligatory EU/national regulations and legislations and standards that could be related to your asset(s) provided and/or developed for the HEIDI project.

Please fill in the tables and answer the questions in each part thinking always on the KER you have/will developed/adapted/improved during the HEIDI project. The questions refer to your plans (post-project) regarding the future development, commercialization, and exploitation of these results.

Key concepts

According to the Grant Agreement (Article 16.1) **Background** is defined as "*data, know-how or information (…) that is (…) needed to implement the Action or exploit the results*". Because of this need, Access Rights have to be granted in principle, but Parties must identify and agree amongst them on the Background for the Project. This is the purpose of this attachment.

PART 1 – Background IP included in HEIDI

The aim of this section is to update the information related to the Background provided for the HEIDI project.

Please check and update (if needed) the tables provided in CA (Annex 1 of HEIDI CA) and the information provided by your organization at the time of signature of HEIDI Consortium Agreement. If any partner needs to add any additional background information, please use the table provided for the other partners or add the info in your table using track changes.

PART 2 – Regulatory Landscape

This section aims to collect inputs regarding the different regulations, legislations, and standards from HEIDI partners, that the HEIDI project and assets must comply with and need to be addressed during the development activities.

Please, list any obligatory EU/national regulations and legislations that could be related to your asset(s) provided and/or developed for the HEIDI project.

EU/national regulations:	
EU/national legislations:	

Please, list any standard that could be related to your asset(s) provided and/or developed for the needs of the HEIDI project.

Standard:	

ANNEX III - HEIDI main exploitation stakeholders

The HEIDI consortium identified (in D8.3) the following stakeholders' categories that may be interested in the exploitation of the project results:

Target group	Description	Time frame	Channel
A – Business stakeholders	Automobile operators, and other stakeholders who might use or receive benefits from HEIDI assets (e.g., significant increase in safety).	Last 12 months of the project	Website, digital press notes in specialised websites, workshops, B2B, etc.
B – IT technology providers; Industry associations and clusters	OEMs in partner network: As beneficiaries of HEIDI HMI solutions and guidelines regarding ethics and human-centred methodology. Raising awareness of the challenges in the field of technical/modelling and HMI; present the results; raise interest towards the project itself but also towards the developed technologies, build support.	Project life	Website, digital press notes, workshops, newsletters, exhibitions, etc.
C – Policy makers and Standardization Organisations	Adopting the standardisation guidelines developed in the HEIDI project (e.g., like EuroNCAP and IEEE)	Last 12 months of the project	Uptake of standardisation guidelines resulting in improved legislation and standardisation, especially for external HMIs. Adaptation of ethical and human-centred guidelines by the broader community.
D – Scientific Community	Promoting the scientific developments of HEIDI in compliance with the Findable, Accessible Interoperable, and Reusable (FAIR) principle and the open science practices. Scientific publications and further evolving the state of the art.	From M6 until the end of the project	Academic conferences, scientific journals, exhibitions, social media, newsletter, final event, community work.
E – Related R&D projects and Networks	Involving or establishing networks to disseminate public project findings, and exchange knowledge.	Project life	HEIDI website, social media, workshops, exhibitions, international conferences, newsletter, final event.
F – End users (Road users)	Drivers and other road users, as main users of these technologies. Promotion of the HEIDI project to raise awareness and build support.	Project life	HEIDI website, social media, workshops, exhibitions, international conferences, newsletter, final event.