D1.4 Societal impact report

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[1] **R**=Document, report; **DEM**=Demonstrator, pilot, prototype; **DEC**=website, patent fillings, videos, etc.; **OTHER**=other

[2] **PU**=Public, **CO**=Confidential, only for members of the consortium (including the Commission Services), **CI**=Classified, as referred to in Commission Decision 2001/844/EC

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ACRONYMS AND ABBREVIATIONS

CH	Cultural Heritage
MCU	Microcontroller Unit
SPIFFS	Serial Peripheral Interface Flash Filing System
ULP	Ultra Low Power
RTC	Real Time Clock
I2C	Inter-Integrated Circuit
GPIO	General-Purpose Input/ Output
SPI	Serial Peripheral Interface
ADC	Analog to Digital Converter
PCB	Printed Circuit Board
ABS	Acrylonitrile Butadiene Styrene
UV	Ultraviolet

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Executive Summary

In this deliverable we report on the methodology and results of all the societal, gender and ethical issues of the project.

1. Introduction

1.1 Purpose and scope

In all EU Horizon projects, ethics and ethical compliance are mandatory steps to take emphasising the need to adopt certain protocols and develop dedicated technological frameworks, to ensure HYPERION outcomes' compliance. Ethics is declared as a part of research, and compliance with the ethical standards that the European Commission sets for all activities funded by the European Union is seen as pivotal to achieving real research excellence. The ethical evaluation starts from the proposal phase and carries on throughout the project implementation. Making a thorough ethical evaluation from the conceptual stage of the project is of great importance, not only to respect the legal framework but also to enhance the quality of the research. Ethical principles and legislation to scientific research in all possible domains must be applied, ensuring that the above legal framework will be preserved after the finalisation of the project.

In this context, this document aims to report the activities that have been undertaken during the whole duration of the HYPERION project. Emphasis is given on the consortium's activities in relation to conformance with relevant regulations and mitigating any ethical or security issues through the course of the project. It covers the ethical and security aspects of the design and conduct of research and the evaluation of the aforementioned aspects during the pilot demonstrations, including guidance provided to the consortium to avoid scientific misconduct and ensure Responsible Research Innovation (RRI).

The current document gives an update based on the outlines that have been described during the intermediate version of this deliverable (uploaded to the project's repository in M18).

1.2 Intended readership

As a public document, this deliverable is intended for all interested readers.

1.3 Document structure

The document structure is initiated with an introductory chapter that highlights the purpose and the objectives that are addressed through HYPERION ethical and security methodology (Section 1). Moving to the rest of the document, Section 2 provides information regarding the background regulations and standards that are considered by HYPERION management and monitoring activities and discusses the ethical, legal and security issues that need to be considered across the different project Work Packages, the management structure for these issues, as well as the processes that have been employed so far. Section 3 is providing an overview of the societal impact of HYPERION project in relation to the products and services developed as part of the project. Section 4 covers the HYPERION measures for gender equality and the actions taken to empower this direction during the project. Finally, Section 5 presents in detail a set of fundamental principles to ensure GDPR compliance.

2. HYPERION ethical and security methodology

2.1 Applicable rules

Like all other projects funded under Horizon 2020, HYPERION follows the Horizon 2020 Rules for Participation (Regulation (EU) No 1290/2013), which highlights the need for the grant agreement (GA) to include provisions ensuring the respect for ethical principles. As stated in part B of the HYPERION GA, all relevant legal and ethical standards and guidelines have been rigorously applied, irrespective of the country in which the research was implemented. In general, the legislation regulating Horizon 2020, focuses on two types of ethical obligations that are addressed during the phases of grant agreement (GA) preparation and throughout the project implementation, with the second to be defined within the submitted deliverables. During the GA preparation phase, the regulation establishing Horizon 2020 (Regulation 1291/11-12-2013) defines the Ethical principles in Article 19, (Table 1).

Table 1: Regulation of Ethical principles

Article 19 Ethical principles

1. All the research and innovation activities carried out under Horizon 2020 shall comply with ethical principles and relevant national, Union and international legislation, including the Charter of Fundamental Rights of the European Union and the European Convention on Human Rights and its Supplementary Protocols. Particular attention shall be paid to the principle of proportionality, the right to privacy, the right to the protection of personal data, the right to the physical and mental integrity of a person, the right to non-discrimination and the need to ensure high levels of human health protection.

2. Research and innovation activities carried out under Horizon 2020 shall have an exclusive focus on civil applications.

3. The following fields of research shall not be financed: (a) research activity aiming at human cloning for reproductive purposes; (b) research activity intended to modify the genetic heritage of human beings which could make such changes heritable; (c) research activities intended to create human embryos solely for the purpose of research or for the purpose of stem cell procurement, including by means of somatic cell nuclear transfer.

4. Research on human stem cells, both adult and embryonic, may be financed, depending on both the contents of the scientific proposal and the legal framework of the Member States involved. No funding shall be granted for research activities that are prohibited in all the Member States. No activity shall be funded in a Member State where such activity is forbidden.

5. The fields of research set out in paragraph 3 of this Article may be reviewed within the context of the interim evaluation set out in Article 32(3) in the light of scientific advances.

At the EU level, the Lisbon Treaty (forming the constitutional basis of the EU) makes explicit reference to the Charter of Fundamental Rights[3] of the EU (2012). The Charter focuses on the right to the integrity of a person, protection of personal, civic, political,

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[3] https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2010:083:0389:0403:en:PDF

economic and social rights, as well as academic freedom and freedom of scientific research, (Table 2). The EU General Data Protection Regulation (2016/679 ("GDPR")), which has as of May 2018 extended the earlier Directive 95/46/EC of the European Parliament and of the Council of October 1995 on the protection of individuals with regards to the processing of personal data and the free movement of such data, also applies throughout the EU and aims to ensure that everyone's personal data enjoys a high standard of protection.

Table 2: Description of the existed legal rules that are related to the integrity of the person, the protection of personal data and the freedom of research.

Article 3: Right to the integrity of the person

- Everyone has the right to respect for his or her physical and mental integrity.
- In the fields of medicine and biology, the following must be respected in particular.
  - The free and informed consent of the person concerned, according to the persons.
  - The prohibition of eugenic practices, in particular those aiming at the selection of persons.
  - The prohibition on making the human body and its parts as such a source of financial gain.
  - The prohibition of the reproductive cloning of human beings.

Article 8: Protection of personal data

1. Everyone has the right to the protection of personal data concerning him or her.
2. Such data must be processed fairly for specified purposes and on the basis of law. Everyone has the right of access to data which has been collected concerning him or her, and the right to have it rectified.
3. Compliance with these rules shall be subject to control by an independent authority.

Article 13: Freedom of the arts and sciences

The arts and scientific research shall be free of constraint. Academic freedom shall be respected.

Additionally, the design of studies adheres to the Declaration of Helsinki (1964/2013) and the Ethics of Information and Communication Technologies report from the European Group on Ethics in Science and New Technologies to the European Commission (2012).

Considering also the need to comply with the national laws related to the security and protection of personal data, the following regulations in Spain, Italy, Greece and Norway were found[4], which are compliant with the EU Regulation 2016/679 of the European Parliament which is based on the protection of natural persons with regard to the processing of personal data and the free movement of such data (GDPR).

- The pilot demonstration in Spain had to be compliant with the Royal Decree 428/1993 of 1993, as amended by Organic Act 15/1999 in 1999, which extended the protection of Spanish residents' personal data and information collected via electronic means with the Protection of Personal Data Act.

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[4] https://www.dataguidance.com/

- The pilot demonstration in Italy had to be compliant with Law 196/2003 ("Italian Privacy Code") for those aspects that the GDPR delegates to the Member States.
- The pilot demonstration in Greece had to be compliant with Law 4624/2019, which has implemented Regulation (EU) 2016/679 (GDPR) and incorporated Directive (EU) 2016/680.
- The pilot demonstration in Norway had to be compliant with the Norwegian Personal Data Act (personopplysningsloven), which supplements the European General Data Protection Regulation (2016/679, "GDPR") and tailors its provisions to the particular national context.

These rules apply across all HYPERION activities including the realization of research and innovation activities, the collection of personal data, the conduction of large-scale demonstrations in the project's pilot areas as well as the communication and dissemination of the project activities and outputs. The HYPERION consortium places high value on the need to protect participants' data, privacy, and dignity and therefore each consortium partner agreed to comply with all respective EU regulations and relative main Human Rights and Data Protection Principles:

Table 3: Summary of Data Protection and Human Rights Principles

Autonomy	The right to choose for oneself (e.g. to participate or determine one's outcomes).
Freedom from discrimination	HYPERION ensured no stakeholder or research subject was treated less favourably than another person.
Privacy	Privacy relates to various rights to be left alone, including informational privacy, decisional privacy, and physical privacy. It is a right held by an individual in balance with the interests of the public.
Dignity	Providing respect to others (of their views, choices, and decisions) and treating them in ways that keep integrity in the relationship.
Solidarity	Considerations in the public interest, in conjunction with benefit for self and others, are built upon an understanding of commonality.
Accountability	HYPERION partners followed appropriate technical and organisational measures, including data protection policies, maintaining documentation of your processing activities, and adhering to relevant codes of conduct. This also includes recording and, where necessary, reporting personal data breaches.
Right to be forgotten	Under Art. 17 of the GDPR data subjects will have a right to obtain erasure from the data controller without undue delay. HYPERION research participants have the right to have the record of their participation in the research deleted. However, this right is not absolute, particularly if personal data is processed solely for the purposes of research.

Principles relating to the processing of personal data	Following Art. 5 of the GDPR, personal data were, and shall be processed lawfully, fairly and in a transparent manner in relation to the data subject. Moreover, this data has been collected for specified, explicit and legitimate purposes and will not be further processed in a manner that is incompatible with those purposes. Data minimisation is part of this.
Data security	Following Section 2 of the GDPR, Data controllers have taken technical and organisational measures to ensure an appropriate level of security for data, including the use of pseudonymisation and encryption, ensuring appropriate confidentiality and resilience of systems, providing access to data in a timely matter in the event of an incident and undertaking regular testing of the security of the system.
Notification of data breaches	Under Art. 33 of the GDPR authorities and data subjects should be notified of any data breaches within 72 hours of their occurrence.
Data minimization	No data which is not strictly necessary for running the HYPERION project was collected or processed.
Purpose limitation	Explicit, pre-defined, legitimate initial purpose. This includes the prohibition of secondary use for purposes not compatible with the initial purpose.
Proportionality	Benefits should be weighed between (private/public) interests to be protected, the means of protecting, and the limitation of individual rights for such protection.
Accuracy	Clear distinctions between 1) personal data of i) survey participants, ii) pilot participants, iii) third parties and 2) degrees of accuracy and reliability of personal data (evidence, assessment etc.)
Time-limited	Identified/identifiable information is kept in a form which permits the identification of data subjects for no longer than it is necessary for the purposes for which the personal data are processed.
Security	Security of storage and access rights by designing and implementing appropriate measures and processes.

2.2 Ethical, legal and security aspects in HYPERION

The HYPERION consortium has not identified any specific ethical, legal and security issues related to the activities of the project that are not already addressed in the Grant Agreement. Ethical procedures have been specified within the project (and disseminated between consortium members) and these procedures have been followed in project activities.

Specific work packages (WPs) and tasks, in which ethical, legal and security considerations have to be taken into consideration include:

- WP2, which aimed to obtain stakeholder engagement and identify the needs, opinions, and ideas of individual experts, while also including the HYPERION system architecture. In the Appendix B shall be found the exact reference to the terms and conditions that were provided to the participants and the compliance with Ethical and GDPR procedures.

- WP6 that implemented targeted drone flights in pilot areas in Italy and Greece. More specifically all the national and EU regulations for the flights were taken into consideration.

- WP8, that covered the conduction of the project's pilot demonstrations and the procedure followed to measure the impact of HYPERION tools. Descriptions are focused on online surveys circulated among the pilot participants, to gather feedback from relevant actors as well as on the toolbox components that required user registration.

- WP10, that involved the organisation of events and/or surveys towards the promotion of project activities and the elicitation of feedback on marketing perspectives.

2.3 Management of ethical, legal and security aspects in HYPERION

As laid down in the GA, any matters requiring legal expertise or related to privacy protection, ethics/gender considerations have been handled by the HYPERION Ethics Board, responsible for:

- Monitoring the legal, ethical and security activities of the project (ensuring that all evaluations follow ethical and legal procedures as relevant to National and European regulations)

- Keeping record of all potential legal, privacy and ethical issues as the innovations are evaluated and demonstrated in the Demonstrations (although no ethical issues are expected); all participatory activities of the project with participants are going to be monitored so that they abide by the EU GDPR rules; the same applies for generated or used data from the pilots ensuring that sensitive data are anonymised and stored according to the EU regulations

- Ensuring that Social Science Humanities (SSH) is embedded in the project as an enabler of Responsible Research Innovation (RRI)

- Monitoring any gender aspects which arise and overseeing the promotion of gender equality.

The board ensured the proper adoption of the legal, ethical and security framework of the HYPERION solutions and found no potential ethical issues arising as the prototypes were developed and evaluated, nor during discussions with the stakeholders.

2.4 Engagement activities & participatory methods

For conducting responsible and ethical social research with human participants with respect to the participatory activities of the project (WP2, WP8, WP10), the following principles applied in HYPERION:

1. Research participation was voluntary and free from coercion.
2. Research provided value that clearly outweighs any risk or harm.
3. Research participants, as well as research staff, were provided with accurate information about the research, objectives, methods, purpose, and use of data.
4. Confidentiality regarding research participation was ensured. Participations by individuals as well as groups were anonymised and their wishes in this regard respected.
5. Research was independent, and no conflicts of interest have risen.
6. Personal data was protected according to data management procedures and legislation documents.

Furthermore, the following section provides an overview of the obligations of the organizations acting as data controllers and data processors in the cases where personal information was collected from the participants. In the case of technological implementation, appropriate licensing agreements were required for data reuse after the project's conclusion, which is defined in the latest version of the data management plan of the project (Deliverable D1.5).

2.5 Obligations of Data Controllers and Data Processors

The Data Controller should implement appropriate technical and organisational measures to ensure and be able to demonstrate that processing is performed following the GDPR requirements. The Controller should maintain a record of processing activities, which must contain the following information (Appendix A):

• The purposes of the processing
• A description of the categories of data subjects and of personal data
• The categories of recipients to whom the personal data have been or will be disclosed, including recipients in third countries or international organisations
• The envisaged time limits for erasure of the different categories of data
• A general description of the technical and organisational security measures

The Data Processor should process the personal data only on documented instructions from the Controller, should ensure that persons authorised to process the personal data have committed themselves to confidentiality and should delete or return all the personal data to the Data Controller after the end of the processing.

In the case of a personal data breach, the Controller should without undue delay notify the breach to the supervisory authority, unless the personal data breach is unlikely to result in a risk to the rights and freedoms of natural persons. When the personal data

breach is likely to result in a high risk to the rights and freedoms of natural persons, the Controller should communicate the breach to the data subject without undue delay.

The Data Controller has to establish and maintain a consent management process based on which records of when and how he got consent from the individual, as well as exactly what people were told at the time. In case of written consent, a copy of the relevant document is kept. If consent is given online, the records shall include the data submitted as well as a timestamp to link it to the data capture form. Cases, where the consent is withdrawn, are also recorded. Regular consent reviews are performed by the Data Controllers during the pilot demonstration campaigns of the project.

2.6 Privacy policies for project activities and tools

A privacy policy is a statement that discloses some or all of the ways a party gathers, uses, discloses, manages and stores an involved user's data. It fulfils the legal requirement to protect a person's privacy.

GDPR demands certain requirements for transparency about the processing and the communication with the person concerned. A privacy policy must have the following characteristics being:

- concise
- transparent
- easy to understand
- easy to access

These requirements should ensure that the data subject knows exactly where it stands according to the protection of its data. Additional and more specific requirements may apply, depending on the way data is being collected. Data can be collected directly or indirectly. When it comes to direct data collection, the data subject inserts its data itself, for example via web form while registering to receive project news. When data is collected via an external source (i.e. specialised software for keeping website usage statistics), one speaks of indirect data collection.

In case the data is being collected directly from the candidate participant, the privacy policy needs to be provided before or before the corresponding data is being transferred. The privacy policy should at least contain the following information:

- the data processor's identity and contact information
- the goal and legal foundation for the processing
- the data processor's legitimate interest
- the possible recipients (or categories of recipients) of the personal data
- information regarding the forwarding of personal data to a third country (outside the EU), if that's the case
- the storage period or the criteria that are being used to determine the storage period
- the person concerned needs to be informed about his/her rights

- the person concerned needs to be informed about his/her right to withdraw his/her approval for the processing of data
- the person concerned needs to be informed that it has the right to file a complaint
- the existence of automated decision-making, including profiling, and, at least in those cases, meaningful information about the logic involved, as well as the significance and the envisaged consequences of such processing for the data subject.

If data are collected indirectly, the same requirements as illustrated above apply. Additionally, it needs to be indicated which type of data (category) was processed and which source has been used.

In the context of HYPERION, privacy policy for the subscription of participants to receive HYPERION's news updates (Appendix B) have been compiled according to the abovementioned principles. The purpose of data processing is used for sending i) HYPERION' s periodic E-Newsletter; ii) invitations about project coming events, workshops, pilots, and demonstrations; iii) notifications containing key project findings/developments and lead stories and news related to the project.

Similarly, users providing feedback through online surveys regarding the use of the different project tools have to opt-in to the dedicated privacy policy (example provided in Appendix C). Before submitting the survey, all participants must read carefully the constructed document stating the Privacy Policy of the HYPERION project and give their consent to participate in the survey. In the case of absence of consent, the survey cannot be submitted.

The same applies also during the user registration to project tools where personal related information needs to be provided and maintained (i.e., name, surname, email, etc.).

2.7 Integration between HYPERION toolbox API & HRAP infrastructure

During the definition of the HYPERION toolbox system architecture, particular attention was given towards ensuring compliance with GDPR provisions and all legal and ethical directives. Technical features to address security perspectives have been analysed, tackling different issues such as data integrity and confidentiality, access control, authentication, and authorization. Apart from considerations that underpin the toolbox components, HYPERION system has been designed and is currently being implemented so as to facilitate connection and integration with existing information systems that are being utilised by the Paying Agencies.

HYPERION tools API is tasked with the role of both retrieving datasets that are managed by the HRAP as well as conveying information (machine-to-machine interaction) directly from the HYPERION tools components to the HRAP infrastructure. These aspects require the adoption of certain processes that will ensure authenticated and authorised access to relevant protected resources. In this context, a two-level authentication, authorisation process is implemented. Initially the user is

authenticated and authorised with the HYPERION identity access management endpoints provided by the toolbox API. For instance, during registration, personal identifiers (i.e. passport id or unique applicant number) are securely managed through the HYPERION toolbox API. After login in HYPERION, the aforementioned data are forwarded to the HRAP identity and access management system in order to retrieve the respective authorization enabling the retrieval of beneficiaries' application data to be processed by the HYPERION toolbox. Through this way, the penetration into HYPERION of personal information (stored at Paying Agencies infrastructure) that reside with the data to be processed by toolbox components is avoided.

3. Societal Impact

3.1 Understanding Europe's Cultural Diversity

Europe's cultural legacy is one of the world's most diverse. It is a beacon that draws millions of people every year to our archaeological sites, churches, museums, etc. It is both the accumulation of past artistic achievements and the expression of continuing tradition and creativity. HYPERION includes products and services that assist CH experts in understanding the effect of previous restoration processes and taking decisions and mitigation strategies to avoid material degradation phenomena and enhance resilience. This is mainly achieved through a common integrated system that gives the possibility even to non-experts of the tools to get valuable insights. The continuous integration approach that was used as part of the development process of HRAP has provided the possibility to expand to other sites and areas, covering the widespan of Europe's cultural diversity.

3.2 Employability

CH is steering Europe's social as well as economic development. The continent is the world's top tourist destination and he total contribution of Travel & Tourism to GDP was EUR1,848.6bn (9.9% of GDP) in 2017, and is forecast to rise by 2.7% in 2018, and to rise by 2.2% pa to EUR2,367.1bn (10.7% of GDP) in 2028. Regarding the employment, its contribution was 9.8% of total employment (36,618,500 jobs). This is expected to rise by 2.1% in 2018 to 37,403,500 jobs and rise by 1.3% pa to 42,553,000 jobs in 2028 (11.2% of total)37. Until 2020, CH industry grows by an average of 4% annually, taking it to 10% of global GDP. European CH inevitably plays a central role therein. The recent economic recovery of Southern Europe is mainly due to the increase in its touristic product including more than 30% increase of cultural visits (2014-2017). Taking into account the dominant role of Europe in world's cultural product, one can foresee the social impact on employability that is expected to increase by at least 2% in total population by promoting actions towards the cultural dimension.

3.3 Safer and more resilient cities

HYPERION is expected to highly contribute to a safer city network for all citizens, tourists, commuters, and any other users activated in the historic areas, through its advanced services and outputs as presented.

3.4 Inspection and maintenance costs reduction

Currently, there is a precise planning of regular inspections of the CH sites in the historic areas; however, these are often limited due to the operational costs of the inspections. HYPERION allows more frequent inspections. This leads to improved maintenance scheduling, targeting to the forecast of future damages and the on-time intervention (predictive maintenance). This can greatly reduce maintenance costs for the associated organisations.

3.5 Reduce disruption from inspection/intervention

The inspection and restoration of CH assets and of well-known touristic attractions usually requires partial or total shutdown of one or more structures/buildings (or sectors). This is not an easy task for the city/CH operators and requires considerable advance planning, including but not limited to traffic (and crowd) redirection, creation of alternate routes, extended unavailability of assets, etc.

3.6 HYPERION results in relation to the identified societal impacts

The resulting output of HYPERION tools is a digital twin of the entire city, including historic areas , which can be used by the local authorities to assess the threats of CC (and other natural hazards), in order to visualize the built heritage and cultural landscape under future climate scenarios, model the effects of different adaptation strategies, and ultimately prioritize any rehabilitation actions to best allocate funds in both preand post-event environments. That being said, the results of HYPERION project have a direct impact on a series of societal aspects.

HYPERION result	Understanding Europe's Cultural Diversity	Employability	Safer and more resilient cities	Inspection and maintenance costs reduction	Reduce disruption from inspection/intervention
Reliable quantification of climatic, hydrological and atmospheric stressors	Numerical models can be applied in additional locations	Spatial and temporal resolutions shall be adjusted and applied in multiple areas	n/a	Better understanding of inspection and maintenance processes	n/a
Multi-Hazard modelling	Scenarios of multiple hazards can be created and	n/a	Multiple hazards shall be considered in parallel	n/a	n/a

	assessed for new areas				
Environmental and material monitoring including state identification and damage diagnosis	n/a	n/a	n/a	CH sites can be fully monitored in a synoptic manner , allowing the creation of better inspection and maintenance procedures	The downtime of the sites shall be reduced leveraging the buildings situational awarness
Analysis of building materials and deterioration processes	Similar materials between sites can be easily investigated	n/a	n/a	Better planning of inspection processes	Future downtimes can be predicted
Implementation of a Hygro-Thermal (HT) simulation tool	n/a	n/a	Scenarios of future climatic conditions are considered and assessed, better understanding of impacts to the cities.	n/a	n/a
Improved prediction of Structural and Geotechnical (SG) safety risk	n/a	n/a	Structural defects can be identified	Better understanding of post event planning	Better understanding of inspection processes and near real time assessments.
Design of a Holistic Resilience Assessment Platform (HRAP) and a DecisionSupport-System (DSS), enabling communities' participation	All the above systems are integrated in a single platform allowing pre event and post event analysis on all the developed tools The possibility to develop and assess new scenarios, allows the impact assessment on the societal effects of CH sites.				

4. Gender Issues

HYPERION's gender policy supports Article 141(3) of the EC Treaty to protect male and female members exercising the rights inherent in fatherhood, motherhood or the combination of professional and family lives and ensure that women participate equally and actively alongside men. HYPERION builds targeted objectives for including gender equality and women's empowerment into the plans and budgets, and use gender-sensitive indicators to monitor and evaluate these impacts. Within HYPERION's methodology gender, age- and group-specific interests and effects are systematically examined in each phase of the project development, from the formulation of goals, through solutions development to implementation monitoring. All the related gender aspects are to be considered under Task 1.3 activities.

Introducing a gender perspective into spatial, functional, environmental and other HYPERION-based criteria is key in making sure that different users' needs are met, as well as that all can benefit from our proposed technologies. Gender mainstreaming is not considered a separate activity or module, but rather it is integrated within all phases and activities of the project. This mainstreaming includes the following principles:

- consider gender issues when collecting, analyzing, and presenting all statistics and data,
- introduce gender related planning criteria as a standard,
- make sure that all citizens are represented in participatory processes (especially regarding Task 7.6 activities),
- use gender-sensitive indicators to monitor and evaluate impacts of the various modules,
- build targeted objectives for including gender equality and women's empowerment into the plans and budgets,
- establish links with the EU platform of women scientists set up by EC to promote gender equality in research.

5. Ethical Issues

5.1 General Principles

The **General Data Protection Regulation** (GDPR) has established a strong legal basis for the collection and processing of personal data when the person (the data subject) has given clear consent to process his or her personal data for a specific purpose. HYPERION project commits to follow the relevant legislation explicitly.

The informed consent forms which have been presented and discussed on D11.1 follow the principles and provisions of the GDPR Regulation for a specific design that focuses on the following:

- The terms must be concise and clear to avoid misinterpretation
- People must be given the option to participate actively

- It should be explicitly stated that it is the right of the people to withdraw their consent at any time, describing a clear withdrawal process, including the reason for the withdrawal.
- People should be provided with clear and detailed information on the actions of the project they are invited to participate in, the purpose that the project aims to serve and the means of data processing (e.g. description of the procedures to be used for the collection, storage, protection, preservation and destruction of data), the Data Controller, the Data Processor and the data storage entity

The purposes and means of processing personal data have been defined and agreed together with the entire project consortium and more specifically with the partners who collect and process personal data under their work packages for HYPERION. In the case of identity data collection, these are stored locally after they are encrypted and protected according to the internal procedures, defined by the general legislative framework, by the responsible partner (controller, processor, storage unit) for each service or tool. This data is not transferred in any way and for any reason to any other unauthorized party and will not be included in any HYPERION output or result.

5.2 Data protection officer

According to article 18 in the directive 95/46/EC the "personal data protection officer" is responsible in particular for ensuring in an independent manner the internal application of the national provisions taken pursuant to the directive, and for keeping the register of processing operations carried out by the controller, containing the items of information referred to a register of processing operation notified shall be kept by the supervisory authority – thereby ensuring that the rights and freedoms of the data subjects are unlikely to be adversely affected by the processing operations.

HYPERION has designated a Data Protection Officer, Dimitris Kalogeras (ICCS) who had a consultative role described as follows:

(a)   Monitor compliance of HYPERION with the GDPR and with other related national or EU data protection provisions.

(b)   Inform and advise the HYPERION partners and the physical persons who carry out data collection and/or data processing, of their obligations.

(c)   Provide advice to any ethical data related matters where requested by other project partners and physical persons related to the project.

(d)   Receive and forward any requests by data subjects to the project Steering Committee

(e)   Cooperate with the Data Protection Officers of the other organizations, partners of the HYPERION project, if needed

The data protection officer of HYPERION can be reached via email on dpo@iccs.gr for any relevant matter.

5.3 Data protection policy

HYPERION sets the basis for a data protection policy plan to be compliant with the regulations set by the EC, for the purposes of the project. Several technical and operational measures are implemented to ensure that users are able to access, rectify, cancel, and oppose the processing and storage of their personal data.

Anonymized data with personal identifiers completely removed are used. For limited specific purposes, where multiple data samples need to be linked to the same individual, pseudonymization by irreversible cryptographic pseudonyms are employed. The linkage information required for re-identification is stored in a separate database utilizing server-side encryption and tightly controlled access. De-identification of data must be performed the soonest possible to the time at which the data are collected. Specifically, in the case of data gathered from personal mobile apps, data de-identification should occur directly at the mobile phone use level. Based on an in-depth risk assessment performed at the initial stage of the project, additional horizontal and/or vertical data partitioning may be used to further decompose data into smaller, independently controlled parts.

Encrypted communication based on SSL/TLS/SSH is used whenever any data or information, especially personal is transferred between systems. As a general rule, collected sensitive data are stored as close to the point of origin as possible. Data is released for further processing by other components of the HYPERION architecture on a strict need-to-know basis – only required information is released and with the minimum amount of detail and specificity required for a given processing task. Whenever aggregated data are sufficient, individual records, even made anonymous, are not used. Secure computation techniques are used to derive required processing results without having to collate all information in a single location. Access to all data is restricted using appropriate authentication and authorization techniques (passwords, private keys etc.). Only minimum access privileges required to fulfil their roles are granted to individuals and systems. Access to personal information is monitored and logged. It is ensured that all individuals working with personal data within the project are aware of their responsibilities and obligations with respect to data protection.

The data collected in the context of the project and used beyond the scope of the project, if any, are declared to the National Authorities/Agencies responsible for Data Protection. Every entity involved in handling data in some way has to do this at national level, not only the entities collecting data, but also the ones in charge of storing or processing them. Following, the appropriate Data Protection Certificates and Approvals (DPCs) must be provided.

Informed consent procedures occured to ensure that participants are informed about what personal data is tracked and what observations are made, why this personal data is requested/obtained, what the personal data is used for, how their personal data is handled, what is involved in taking part, and any potential risk they incur by participating in the user studies, trials or using the application. Additionally, participants are informed that their participation is completely voluntary and that they are able to withdraw from the studies at any time without penalty and for any reason.

Regarding data coming directly from mobile devices, explicit user's consent is obtained before the related application is launched.

5.4 Safeguarding the rights and freedoms of the data subjects

HYPERION respects the subjects' rights. In this context the project's consortium implements several steps to safeguard those rights under GDPR.

The 9 Fundamental Data Subject Rights falling under the project's scope and the measures that are taken to ensure them are summarized below:

- **Article 13** – Information to be provided where personal data are collected from the data subject
  - o Detailed information about data collection is provided on the project's information sheet and the corresponding informed consent form which are included on deliverable D11.1
- **Article 15** – Right of access by the data subject
  - o The data subject is able at any time to contact the data controller and obtain confirmation as to whether personal data concerning him or her are being collected and processed, and, where that is the case.
- **Article 16** – Right to rectification
  - o In case of collecting inaccurate personal data about an individual, HYPERION has the responsibility to correct that information.
- **Article 17** – Right to erasure ('right to be forgotten')
  - o The data subject has the right to obtain from the controller (upon contact) the erasure of personal data concerning him or her without undue delay and the controller has the obligation to erase personal data without undue delay.
- **Article 18** – Right to restriction of processing
  - o The data subject has the right to obtain from the controller restriction of processing or request limits to how their data is processed.
- **Article 19** – Notification obligation regarding rectification or erasure of personal data or restriction of processing
  - o The consortium's responsible data controllers have a responsibility to communicate any rectification or erasure of personal data or restriction of processing carried out to each recipient to whom the personal data have been disclosed, unless this proves impossible or involves disproportionate effort. The controllers informs the data subject about those recipients if the data subject requests it.
- **Article 20** – Right to data portability
  - o Research participants are directly able to transfer their data between electronic processing systems, essentially preventing any one organization from taking sole ownership of any individual's data.
- **Article 21** – Right to object

- o Participants to the research can raise an objection any time they feel data is being used improperly, and the data controller must halt processing until they can prove otherwise.
- **Article 22** – Automated individual decision-making, including profiling
  - o All participants are protected against any automated data-processing that might involve profiling them based on personally identifiable information.

5.5 Data Security

All data collected in HYERION are securely processed.

Hard copies of consent forms and possible identity data needed under local regulations (including names, telephones, emails, addresses, ID, etc) are kept in locked drawers. Any electronic copies are stored locally, encrypted, and protected according to internal procedures by the responsible partner. Only authorised personnel is granted access to such data. Such data is handled according to internal procedures of each partner and is not transferred to other HYPERION partners.

The project deliverables are available in the project's Redmine space https://redmine.iccs.gr/projects/hyperion/. The server hosting the Redmine installation is located in the ICCS premises in Athens, Greece, in a secured rack in the ICCS's servers' room. The server databases are backed up on a daily basis, while its files are backed up every second day. The server is built with multiple redundancies, network- and disk-wise, in order to ensure its constant operation and network access. The web access to https://redmine.iccs.gr/ is secured using a digital certificate from TERENA (https://www.terena.org). Only users authorised by the administrator, ICCS, have access to the material available in the Redmine. Data in the dedicated HYPERION databases will be maintained for 5 years after the end of the project. All databases are implementing state-of-the-art security mechanisms and all computer systems are holding properly licenced anti-malware software.

5.5 Data transfers

Collected (personal) data are not envisaged or expected to be transferred from the EU to a non-EU country or international organization. Also, data are not envisaged or expected to be transferred from a non-EU country to the EU (or another third state). However, if such cases eventually exist, all relevant confirmations that such transfers are in accordance with Chapter V of the General Data Protection Regulation 2016/679 or that they comply with the laws of the country in which the data was collected in general, will be granted.

Appendix A

In case there are controllers and processors of personal data, the corresponding partners are obliged to keep written records of their processing activities and respond to the following questions.

Recording processing activities form

• The name and contact details of the controller(s) and processor(s)
• The purposes of the processing
• The legal basis for processing
• The third-parties to whom the personal data have been or will be disclosed
• The categories of third-parties to whom the personal data have been or will be transferred, including details of safeguards adopted
• The envisaged time limits for erasure of the different categories of data
• A description of the technical and organisational security measures taken to ensure the integrity and confidentiality of the data

Appendix B

HYPERION Newsletter subscription

By accepting to receive HYPERION's new updates you declare that:

- I consent of using my email address, so that HYPERION sends me periodic E-Newsletter, or invitations for HYPERION coming events, workshops, pilots and demonstrations, notifications containing key project's findings/developments and lead stories and news related to the project.
- I consent to the maintenance of the aforementioned personal data for five years after the official end of the HYPERION project.

Privacy Policy for HYPERION's news updates

The EU project HYPERION ("we", "us") is committed to protecting and respecting your privacy. This Privacy Notice sets out the basis on which the personal data collected from you, or that you provide to us, will be processed by us in connection with our communication and dissemination processes. Please read the following document carefully, to understand our views and practices regarding your personal data and how we will treat it.

Where you register to our news and latest research developments, these Privacy Notice provisions will apply to our processing of your personal information.

From the very beginning of our project's course, our main objective was to create the most effective mechanisms in order to spread our knowledge and increase awareness and understanding of our assets and fields of relevance, build new relationships as well as maintain regular contact with our identified audiences and communities. This is the rationale behind our newsletter. The periodic newsletters of HYPERION is a key communication and dissemination mechanism for us and a channel to provide our valuable stories on HYPERION's developments, key findings, forthcoming events and other important news in the fields related to the project.

Taking into consideration the above, the HYPERION Consortium use information held about you in the following ways:

- To send you HYPERION's periodic E-Newsletter;
- To send you invitations for our coming events, workshops, pilots and demonstrations;
- To send you notifications containing key project's findings/developments and lead stories and news related to the project

If you consent to the processing of your personal data for the above-mentioned purposes, the categories of personal data that will be collected and stored in the HYPERION Data Warehouse are:

- your name
- your email (mandatory)

The Consortium will process the personal data of subjects according to the present statement and for the purposes declared herein.

It is noted that according to the General Data Protection Regulation (Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016), you may exercise the following rights that derive from the Regulation:

- Right of access and right to rectification for inaccurate personal data
- Right to erasure of personal data if they are not necessary for service provision
- Right to restrict processing of your data
- Right to object to the processing of your data
- Right to data portability, namely right to receive your data in a structured, commonly used and machine-readable form so that they can be transferred to another data processor.
- Additionally, you have the right to submit a written complaint to the responsible supervisory body for personal data protection in each country.

We hope that we can resolve any query or concern you raise about our use of your information. The General Data Protection Regulation also gives you right to lodge a complaint with a supervisory authority, in particular in the European Union (or European Economic Area) state where you work, normally live or where any alleged infringement of data protection laws occurred.

For any questions or to exercise the rights that derive from the legislation in force about personal data protection, please contact us via email at: antonis.kalis@iccs.gr / a.amditis@iccs.gr

Appendix B

HYPERION Digital Survey

By accepting to conduct this survey you declare that:

- I consent to the use of my name, surname, email address, as well as the organisation where I have been occupied so that HYPERION extracts fruitful information and compiles public reports related to user experience and efficiency of the tools I've tested, including any further recommendations for improvements that would facilitate the uptake and market penetration of the results.
- I consent to the maintenance of the aforementioned personal data for 2 years after the official end of the HYPERION project (May 31, 2025).

Privacy Policy for HYPERION evaluation surveys

The EU project HYPERION is committed to protecting and respecting your privacy. This Privacy Policy sets out the basis on which your personal data will be processed by us in connection with our pilot demonstration activities. Please read the following document carefully, to understand our views and practices regarding your personal data and how we will handle it. When you confirm to participate, these Privacy Policy provisions will apply to our processing of your personal data.

What is HYPERION?

The EU-funded HYPERION project aims to provide the appropriate tools in order to better understand the effects of climate change, ravages of time, intense geological phenomena and extreme weather conditions on archaeological sites and cultural heritage monuments.

Thus, HYPERION will enable end users to have a better understanding of the dangers and threats to tangible cultural heritage, make decisions for a swifter and more effective response, and contribute to the sustainable reorganisation of the historical regions under threat. HYPERION adds on existing tools, by utilizing sensors, including fixed instruments within carefully selected spots in the historic areas, vehicle-based drones, wide-area satellite services and even community engagement tools, to arrive at a more comprehensive and synoptic monitoring and emergency response/damage mapping system. In other words, HYPERION acts as an innovative planning tool that will maximize the performance and the rapidity of the decision-making process for addressing multi-hazard risk understanding, better preparedness, faster, adapted and efficient response, and sustainable reconstruction of historic areas.

For more information about the project please visit https://www.hyperion-project.eu/ .

Purpose of Data Processing

The information provided by the survey will be used in order to:

- Measure and assess the impact, efficiency and usability of the developed components
- Identify the features that have responded the best to users' needs or the ones that need further development;
- Compile public reports with the main findings from the project pilot demonstrations

Categories of data that will be stored

If you consent to the processing of your personal data for the above-mentioned purposes, your personal data (e.g. your name, surname, email address) will be collected and stored in HYPERION.

The Consortium activities will predominately be focused on your answers and ideas rather than the personal data, treating participants as individuals but not according to their personal information.

Security of Processing

The security and protection of your personal data are very important for the Consortium. The Consortium has undertaken all appropriate organizational and technical measures to secure that the data that are collected in the framework of the surveys will be preserved until the end of the project. We take appropriate measures to ensure that all personal data is kept secure including security measures to prevent personal data from being accidentally lost or used or accessed in an unauthorized way. The Consortium will process your information only in an authorised manner and are subject to a duty of confidentiality.

Exercise of your rights

It is noted that according to the General Data Protection Regulation (Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016), you may exercise the following rights that derive from the Regulation:

- Right of access and right to rectification for inaccurate personal data
- Right to erasure of personal data if they are not necessary for service provision
- Right to restrict processing of your data
- Right to object to the processing of your data
- Right to data portability, namely the right to receive your data in a structured, commonly used and machine-readable form so that they can be transferred to another data processor.
- Additionally, you have the right to submit a written complaint to the responsible supervisory body for personal data protection in each country.

The General Data Protection Regulation also gives you the right to lodge a complaint with a supervisory authority, in particular in the European Union (or European Economic Area) state where you work, normally live or where any alleged infringement of data protection laws occurred.

Privacy Policy Changes

Although most changes are likely to be minor, HYPERION may change its Privacy Policy from time to time, and at HYPERION's sole discretion. We encourage you to frequently check this page for any changes to its Privacy Policy.

Contact us

This privacy policy was created by HYPERION.

For any questions regarding this privacy policy, please contact us via email email at: antonis.kalis@iccs.gr / a.amditis@iccs.gr