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Architecture for Scalable, Self-human-centric, Intelligent, Secure, and Tactile next generation IoT

D2.4 - Ethics and Privacy manual v2

Deliverable No.	D2.4	**Due Date**	30-04-2022
Type	Report	**Dissemination Level**	Public
Version	1.0	**WP**	WP2
Description	Ethics and Privacy Protection Manual – will formally specify ways in which conformance with ethical and legal guidelines will be ensured, in line with pertinent EU (and local) documents.		

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Executive Summary

ASSIST-IoT's primary objective is to create a reference architecture for the Next Generation Internet of Things (NG-IoT), and along with the planned technical developments and advances arise a series of ethical and privacy issues that must be mitigated. Starting from distributed intelligence (or decentralised AI) and analysing its advantages over the traditional centralised artificial intelligence (AI), where all data and processes are performed on-site, and processing of large datasets (such in the case of IoT networks) requires significant resources and time. Distributed intelligence, on the other hand, uses multiple points of resources to achieve its goal while at the same time involves no sensitive data exchange between the involved parties, thus enhancing the level of privacy and security.

The ASSIST-IoT Consortium evaluates and addresses (as promised in D2.3) the six critical ethical topics that the European Commission (EC) has recognised for IoT systems deployment, namely: (i) social justice and division, (ii) trust, (iii) blurring of context, in particular the distinction private vs public, (iv) non-neutrality of IoT metaphors, (v) agency: the social contract between people and objects and (vi) autonomy: informed consent vs obfuscation of functionality.

The ethics framework in the project has no updates and remains as the initial deliverable. The ethics framework took steps ahead with the appoint of DPO for each partner and pilot site. The ethics framework guides the interaction for the project's participants which are of two categories: (i) pilot participants, which are the people involved in the pilot demonstrations and (ii) other event participants, covering the participants in workshops, webinars, conferences etc. (partner employees fall under the same categories, based on their participation in events).

The case of the pilot participants is more complex, as the pilot demonstrations may include the collection of personal data. For that reason, the deliverable provides guidelines for onboarding and handling personal data. As some of the pilot sites are yet to be ready to support the pilots, the information is general to guide the procedure and safeguard the participants. The details of the information will be documented in deliverables relevant to the pilots' execution, (e.g., D7.3). In order to ensure compliance with regulations and guidelines and secure all personal information, a plan on how the participants will be approached and informed has been drafted. This plan is the final version and mitigation actions are set. Any required updates, unforeseen at the time of the current deliverable, will be included in deliverables of WP7, along with the report of any occurred incidents (if any). In short, the plan includes detailed information about the participant, the tasks their involvement includes, what data will be collected and processed, and of course, the signing of informed consent.

ASSIST-IoT is to adhere to different legislations. The previous version covered general regulations on data privacy. The current version expands the regulations to other disciplines of the project and site-specific ones.

Compliance with laws and regulations will ensure that the developed ASSIST-IoT architecture will compose a system following the Next Generation IoT and provide value to humans.

The design and development of a reference architecture, such as that of ASSIST-IoT, always has some potential risks which might arise during the project's lifespan. An initial investigation of these risks from an ethical aspect has been performed, and the corresponding mitigation strategies have been identified. Some indicative risks that have been identified include: (i) difficulty in ensuring data security for personal data, (ii) safety of the persons involved in the pilot demonstrations, (iii) accountability for the IoT applications regarding privacy, (iv) digital divide and more. Detailed mitigation strategies have been conceived, and the list is in its final version; any required updates and progress shall be covered via sections in deliverables from WP8 that are closely related to the implementation of the pilots.

In addition, within this version, a new relevant addition has been included aiming at covering the rules (concerning ethical issues) that must be applied by partners whenever developing and deploying the technological enablers of the architecture of ASSIST-IoT.

The initial Ethics manual has been upheld until now, as no ethical or legal issues have risen during the reporting period. The Consortium's partners made use of their experience and upheld the high ethical standards for researching and developing a NGIoT solution.

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List of acronyms

Acronym	Explanation
AB	Advisory Board
AI	Artificial Intelligence
AR	Augmented Reality
CA	Consortium Agreement
CHE	Cargo Handling Equipment
DLT	Distributed Ledger Technology
DOA	Description of Action
DPO	Data Protection Officer
EC	European Commission
EM	Ethics Manager
EU	European Union
GA	Grant Agreement
GDPR	General Data Protection Regulation
H2H	Human-to-Human
H2M	Human-to-Machine
HMI	Human Machine Interaction
HTTP	Hyper Text Transfer Protocol
IoT	Internet of Things
ISC	In-service Conformity
LED	Light-emitting Diode
M2M	Machine-to-Machine
ML	Machine Learning
MLFT	Malta Freeport Terminal
MQTT	Message Queuing Telemetry Transport
MVP	Minimum Viable Product
NGIoT	Next-Generation Internet of Things
OCR	Optical Character Recognition
OECD	Organisation for Economic Co-operation and Development
OEM	Original Equipment Manufacturer
PC	Project Coordinator
PCC	Project Coordination Committee
PDF	Portable Document Format

PDP	Policy Decision Point
PEP	Policy Enforcement Point
PIC	Project Implementation Committee
PII	Personally Identifiable Information
PPE	Personal Protective Equipment
PSEM	Pilot Site Ethical Manager
QR	Quick Response code
SotA	State of the Art

1. About this document

The fundamental objective for ASSIST-IoT is the creation of the architectural blueprint for the Next Generation of Things (NGIoT). The fruition of the innovative architecture calls for the implementation of a series of technological developments aligning to both broad and specific requirements. It is vital for both the validation and the use of the platform to entail the intervention of humans as ASSIST-IoT additionally aims to have a human-centric approach permitting users to exploit NGIoT capacities with ease and quality. People from different disciplines (developers, end-users, research subjects, external contributors for fine-tuning the system) are to participate in the project. As a wide range of people will be involved, the Consortium will be concerned with its privacy and protection as focal points. The spectrum of regulations (regional, national, and European) and guidelines are to be upheld for respecting humans' freedom and rights.

The above points set the requirement for providing a detailed analysis of privacy protection. This deliverable aims to set this analysis and propose proper solutions to cover ethical and privacy issues for the project.

1.1. Deliverable context

Item	Description
Objectives	**O1:** D2.4 presents the updated specifications of the reference architecture for the Next Generation Internet of Things (NG-IoT). **O2:** Specifications and technical development of ethical and privacy issues.
Milestones	This deliverable does not mark any specific milestone; still, it contributes to an update of *ethics regulations.*
Deliverables	This deliverable receives inputs from D2.3 [1.] (ethics and privacy manual) and D3.4 [2.] (legal and regulatory constraints analysis and specifications). Outcomes will feed WP7 deliverables regarding ethics-related actions and WP1.

1.2. The rationale behind the structure

The present deliverable is structured as follows:

- Section 2 provides an introductory description of the ethical processes that will be followed throughout the project's lifecycle related to the ASSIST-IoT ethics Framework.
- In Section 3, ASSIST-IoT's Data Privacy Policy outlines the data privacy policies that will be followed, including data protection and anonymization.
- The Ethical Risk Management and Mitigation report (Section 4) informs about the ethical risks that can arise accompanying the appropriate mitigation strategies.
- This document introduces (in Section 5) the rules regarding ethical concerns (mostly personal data protection) that must be considered whenever developing technological enablers of ASSIST-IoT.
- Last but not least, Conclusion / Future Work presents the conclusion of the Ethics and Privacy Manual.
- In addition, the document comprises three annexes. First, Appendix A is an informed consent form, Appendix B is Data Subject Consent Withdrawal and, lastly, Appendix C is about the ethics guidelines.

1.3. Outcomes of the deliverable

This deliverable is the final version of the Ethics and privacy protection manual. It is also the updated version of the deliverable D2.3 [1.] and aims to present the updates and new information to the original deliverable. The majority of the information remains relevant to this point of time. In this period, the first round of Open Calls open submission was successfully concluded (although winner third parties have not been selected yet by M18). Moreover, advancement on the specifications on the sites have cleared the development path for the project and provided information on ethical and legal aspects. These events are included as updates in the current deliverable.

2. ASSIST-IoT Ethics Framework update

2.1. Introduction

In this section, the reader will find steps and safeguards to get participants involved in ASSIST-IoT activities, focusing on pilot demonstrations, and mentioning participation and dissemination of events such as webinars and conferences. This section is structured as follows: It first outlines the pilot site and the ethical strategies to be fulfilled. The specifics of the participants are then presented and updated, in addition to the required consent form and instructions for obtaining it. Furthermore, Consortium guidelines for incidental findings and delegation of control are displayed. This document provides instructions with fine details that the Consortium will follow when performing pilot demonstrations and other events.

2.2. Updates to Pilot Site ethical strategy

2.2.1. Site deployment description

ASSIST-IoT project moves forward with applying the architecture on the four different pilot sites. The sites are remaining the same as in the initial planning. These pilot sites are the following:

- port automation
- smart safety of workers
- (i)cohesive vehicle monitoring and, (ii) diagnostics

The cohesive vehicle monitoring and diagnostics site involves two entities and is split between the partners Ford and TwoTronic. The ethical approach for the third (and fourth) site should facilitate the fulfilment of the requirements of both sites by focusing on the individual challenges. The pilot will be the testbed for the architecture of the project. For this reason, they have provided legal considerations on national and sector specific regulations that are presented in the following chapters.

2.2.2. Pilot sites ethics strategy

The pilot ethics strategy presented in D2.3 [1.] remains valid to this day. There are updates from the latest version as there was no incident or risk to address during the period lapsed from the previous deliverable.

Appoint a Pilot Site Ethical Manager (PSEM), to every one of the pilot sites. The PSEM will guarantee that all pertinent local/national/EU guidelines and regulations will be obeyed. The PSEM will be liable for defining the pilot's local data privacy and ethical issues and filling a pertinent report. The report was defined in D1.1 [3.] and was the following form. As not all pilot sites are yet in place, the detailed list of the filled forms will be included in deliverable D7.3. Until the time of the current deliverable, no issue has occurred. Any issues (if any) will be reported in the deliverables of WP7 that are closely related to the pilot implementation in a separate section detailing the event(s).

Table 1: Human ethical issues identification

Organization:	*PXX [Acronym]*	***Lead contact***:	
Work package	*WPX*	***Task***	*TX.X*
Task description: *Extracted from GA or free text*			
Site/Pilot: *N/A or the associated use-case*			
Ethics issue identified:			
Proposed mitigation:			
Humans involvement:			
Authorising body: *EM, PIC, PC*			

As already presented in D2.3, the Ethical Manager for the project is appointed to be CERTH's representative, Dr. Konstantinos Votis. The Grant Agreement sets the requirement of appointing an Ethical Manager of the Project (EM) that acts as one of the "governance bodies" for the project. The fundamental goal is to guarantee no misuse from an ethical perspective of the EU-funded research occurs during the project. The role's responsibilities have been detailed in D2.3 [1.]. Additionally, there is no ethical issue risen up to the current reporting period, so no reporting and/or mitigation actions were undertaken.

Additionally, each site has elected a person to act as the Pilot site's Ethics Manager. The following table presents these managers.

Table 2: ASSIST-IoT Pilot Site Ethics Leader

Pilot	PSEM Name
P1 – Port automation	TL: Francisco Blanquer (ho.fblanquer@terminal-link.com)
P2 - Safety Construction Workers	MOW: Piotr Dymarski (P.Dymarski@mostostal.waw.pl)
P3 – Automotive	FORD: Klaus Schusteritz (kschust4@ford.com)

Other activities of the ethical manager address ethical surveillance and participation during the pilots:

- To report to the PIC every ethical issue arose (with the provided template).
- Day-to-day work with Management Committees (PCC and PIC), ensuring alignment of ongoing activities with applicable law(s).
- To keep regular contact with WP7, and task leaders, regarding ethics-related actions.
- To report on any ethical issue arising, either identified by the EM himself or by any member of the Consortium.
- To propose a solution on ethical issues and, if necessary, escalate the decision to higher levels of project governance.
- To update WP1 deliverables if any condition changes, or under particular request (either by the EC or by a Consortium partner).
- To gather the conducted reports and elaborate a consolidated document and explanation before every official review.
- To prepare any requested consent form for associated activities and to gather the required signatures.
- To keep the project's participants updated on the major issues and developments in the ethics for the involved technologies in Europe.
- To deal with the legal issues associated with the deployment of ASSIST-IoT tools.
- To research future implications of the developed solutions of the project.

2.2.3. Pilot sites legal considerations

There are different regulations for ASSIST-IoT project to consider in the lifetime of the project. This is a result of the numerous sectors and technologies involved in the project. In D3.4 [2.], a detailed presentation of the regulation is included. As a result, this section will only briefly provide an overview and present in tables the relevant regulations.

As ASSIST-IoT's goal is to deliver an innovative architecture for the NG-IoT, different technologies are considered in the architecture. European regulations are in place and presented in the following table.

Table 3: European Regulation

Regulation Abbreviation	Regulation title
Regulation (EU) 2016/679	Data Protection
Directive 2002/58/EC	Privacy
Regulation (EU) 2019/881	Cybersecurity
Regulation (EU) 2018/1807	Data Governance
Commission Implementing Regulation (EU) 2020/1070	5G networks

Moreover, the project aims to push the intelligence and operations closer to edge devices in the IoT networks. European regulations provide details on the radio equipment, electromagnetic compatibility, and more subjects to harmonise actions in Europe.

Table 4: Electronic devices Regulation

Regulation Abbreviation	Regulation title
Directive 2001/95/EC	General product safety
Directive 2014/35/EU	Harmonisation on the market of electrical equipment designed for use within certain voltage limits
Directive 2014/30/EU	Electromagnetic compatibility
Directive 2014/53/EU	Harmonisation on the market of radio equipment
Directive 2001/95/EC	General product safety

Pilot sites will be the testbed for the suggested architecture of the project making to comply with national regulations on the sites' premises. The pilot sites have identified national regulation relevant to the personal data that the project should consider during the development. The national legislations are presented in the following table:

Table 5: National Regulation

Country	Regulation	Specificity
Spain	Ley Orgánica 3/2018	Personal data protection
Poland	Dz.U. 2018 poz. 1000	Personal data protection
Poland	Dz.U. 2018 poz. 1560	Cybersecurity act
Greece	Law no. 4624	Personal data protection
Malta	Data Protection Act. 2018	Personal data protection
Germany	Bundesdatenschutzgesetz	Federal Data Protection Act

Furthermore, each site is in a different section which necessitates to focus on sector specific regulations. The Port Automation pilot has documented additional legislation to consider apart from personal data. The additional legislation is relevant to ports, machinery used on the premises, and the employees. The following table is a concise overview of the legislation.

Table 6: Port Regulation

Regulation Abbreviation	Regulation title
EN 13557 + A2 Cranes	Controls and control stations
EN 60204-32	Safety of machinery

EN ISO 13849-1	Safety of machinery
EN 1746	Safety of machinery
EN ISO 4871	Acoustics
ISO 12100	Safety of machinery
Directive 89/391/EEC	Workers safety
Directive 2001/96/EC	Safety requirements
Directive 2010/65/EU	Shipping formalities
Directive 2005/65/EC	Port security
Directive 2016/1148	Measures for common level of security of network and information systems
EN ISO 1400:2015	Environmental management systems

The second pilot focuses on workers' safety and involves different legislation on equipment requirements along with requirements to meet in the pilot. The site brought forth specific regulations to expand the general regulation around personal data and other regulations.

Table 7: Workers Safety Regulation

Regulation Abbreviation	Regulation title
Council Directive 89/391/EEC	Measures to encourage improvements in the safety and health of workers
Council Directive 89/656/EEC	Minimum health and safety requirements for the use by workers of personal protective equipment at the workplace
Regulation (EU) 2016/425	Personal protective equipment
Council Directive 89/654/EEC	Minimum safety and health requirements for the workplace
Directive 2009/104/EC	Minimum safety and health requirements for the use of work equipment by workers at work
Directive 2009/104/EC	Minimum safety and health requirements for the use of work equipment by workers
Directive 92/58/EEC	Minimum requirements for the provision of safety and/or health signs at work
Directive 2006/42/EC	Machinery

2.3. Updates to Participants

The participation of various stakeholders is an integral part of the project's path to achieving its goals. Since the publication of D2.3 [1.], no changes have occurred as to the type of ASSIST-IoT participants. For convenience, the participants' categories are presented below:

1. Pilot participants: are the people involved in the pilot demonstrations of the project (as described in the ASSIST-IoT Pilot Site ethical strategy).

2. Other event participants: these can include people participating in webinars, conferences, workshops etc. organised by ASSIST-IoT action.

It should be mentioned here that partners' personnel are categorised as above depending on their involvement in the various activities (i.e., partner employees should not be treated differently than any other participants). The following subsections will describe how the participants will be onboarded and, most importantly, how the informed consent for their participation will be obtained.

2.3.1. Communication

The communication plan identified in deliverable D2.3 [1.] is still valid, and no issues have been identified. It will not be presented analytically again here to avoid repetition, only the main points will be listed below, for emphasis (text copied from D2.3):

- Participation will be on a strictly voluntary base
- Only "healthy adults" will be allowed to participate in the pilot demonstrations; "healthy" in the sense that (i) they are capable of understanding the requirements of their involvement, and (ii) are able to decide about their participation on their own, and also (iii) that they have the physical and mental capacity to carry out the required tasks. Moreover, "adults" refers to the fact that no minors will be allowed to participate in pilot demonstrations.
- Confidentiality: the names of the participants will not be made public in deliverables, reports, etc.
- Right to receive more information about the project
- Informed consent: each and every participant will have to sign an informed consent form, that will be carefully evaluated

2.3.2. Informed Consent

The informed consent template that was presented in D2.3 [1.] (and D1.2 [4.]) is still valid without changes. It will be used during the pilot demonstrations, in both English and the local language. The consent form is presented in Appendix A, for convenience, along with the "Data Subject Consent Withdrawal" (Appendix B) that any participant can use to withdraw their participation without the need to provide reason and with no negative impact.

Moreover, the plan for obtaining informed consent for other types of activities (e.g., video recordings, newsletters, social media publications etc.) is also unchanged with respect to D2.3.

One essential activity in the project is the definition of guidelines for the interviews to be contacted for the pilot sites. The interviews will be tailored to the pilot sites' needs and requirements, so their type can vary from online to physical interviews. There are different sources to get accustomed to the subjects of interviews and the etiquette **¡Error! No se encuentra el origen de la referencia.**, **¡Error! No se encuentra el origen de la referencia.**. The following suggestions are general in order for pilots to be prepared to contact their interviews and interact with the participants. All in all, the essential point in each interview will be the wellbeing of participants, including physical, mental, and psychological aspects of health.

During the interviews, the following guidelines can be helpful in benefitting both the researchers and participants:

The preparation begins prior to the interviews, as a set of open-minded questions should be drafted beforehand. The questions must avoid leading the interviewee to a specific result rather than letting the participant share his honest and unbiased opinions.

Moreover, the interview must be respectful of the principles of transparency and honesty throughout the duration of the interview. For that reason, a detailed explanation of the interview's purpose that is clear to the interviewee shall open the interview. Additionally, the interviewee shall feel free and not hesitate to pose questions for further information. Recording the interview depends on the choice of strategy to be followed by the pilot, but it must be clearly announced during the interview and leave room for the participant to provide or deny his permission. The interviewer must clarify that the recording involves the project's objective solely, and no further use is foreseen.

Regardless of the type of interview (online, physical, etc.), the participant should feel comfortable and listened to wholeheartedly. If a participant's claim is unclear to the interviewer, the interviewer must ask questions to clarify the claim and avoid misunderstandings.

As stated earlier, the participant should feel comfortable during the interview. In the case of discomfort or unwillingness to answer a question, the interviewer must be respectful and protect the participant's wellbeing.

The interviewer should provide privacy and anonymity to the participants regardless of the type of interview. The participant could remain anonymous, and the interviewer shall take the extra steps to guarantee so.

Once the interview concludes, the interviewer shall remind the purpose of the interview and the goal of the collected information. Moreover, the interviewer shall ensure the privacy of the participants.

2.4. Open Calls: legal and ethical aspects

The Open Call process require gathering data about the participants in the call. The ASSIST-IoT project has set criteria for participation that have been followed. The sole purpose of the data collection during the open call rounds is to allow the verification of the eligibility of the submitted applications. The criteria are publicly available and accompany the Open Call for transparency reasons. During the first Open Call, the criteria were about the type of entities, operational eligibility criteria, and administrative criteria.

Moreover, information detailing the project has been published along with the open calls and can be consulted on ASSIST-IoT's official website. Interested parties shall be informed of the project's specificities in order to decide upon joining the open calls. The participants are given instructions on the proposal template to guide them in the most efficient way possible.

An "Ethics Guidelines" document for the Open Calls has been developed and accompanied the application form. The document is presented Appendix C.

Furthermore, the evaluation process is currently on-going. Proposals meeting the eligibility criteria are to advance to the evaluation process, where they will be allocated a score based on evaluation criteria. The evaluation criteria are the relevance to the project, the impact, the technical excellence, the quality of implementation, and the quality of the team. Each criterion is graded with a maximum value of five, and a minimum grade is in place for ensuring the quality of the proposals. Two different experts from the project will perform the evaluation process resulting in the Evaluation Summary Report (ESR) for every proposal. A committee formulating around the Project Coordination Committee members of the project and two external observers will rank the ESRs for the final evaluation. The participation of external observers aims to uphold the impartiality of the procedure.

The Open Call deadlines are to be upheld strictly for providing fairness to all applicants. For Open Call #1, and until the publication of D2.4 this was valid.

2.5. Incidental findings

Incidental findings policy for ASSIST-IoT identified in D2.3 [1.] remains valid without the need for changes. No incidental findings have been reported in the current period.

3. Data Privacy Policy updates

The data privacy policies that are employed by ASSIST-IoT have been presented in D2.3 [1.] in brief, and in more detail in D1.2 [4.]. These policies are still valid to the date of D2.4 publication, and no issues have been identified with respect to data privacy.

Generally, there are two governance figures which are the Data Protection Officer and Data Project Officer. These two figures are accompanied by the PSEM for each site and partner to carry out ASSIST-IoT activities. Their task is to contact, inform, and support the research participants and be in close collaboration with the project's EM. The following table provides the overview of the personnel on that role.

Table 8: Pilot and Partner DPO

Pilot/Partner	DPO Name	Pilot/Partner	DPO Name
UPV	Ignacio Lacalle	NEWAYS	John Wallaard
PRO	Eduardo Garro Crevillén	ICCS	Kostas Naskou

SPIRAS	Michal Tuz	KONECRANES	Lasse Toivonen
CERTH	Ioannis Chalinidis	FORD-WERKE	Nick Engwicht
TL	Francisco Blanquer	S21SEC	Jose Prieto Dominguez
INFOLYSIS	Vaios Koumaras	TWOTRONIC	Michael Müller
CIOP PIB	Andrzej Biernacki	OPL	Slawomir Chmielewski
MOW	Piotr Dymarski		

4. Ethical Risk Management and Mitigation report

None of the Ethical Risks identified in D2.3 [1.] have occurred during the reporting period, nor any other type of Ethical Risk has been identified.

The Risk Management and Mitigation plans presented in D2.3 is still valid.

5. Ethical rules applying to technological enablers and ASSIST-IoT developments

This section is a new chapter introduced in this document and aims at covering the rules (concerning ethical issues) that must be applied by partners whenever developing and deploying the technological enablers of the architecture of ASSIST-IoT.

As it was defined at the beginning of task T4.3 (Data Management Plane), one of the expected outcomes of that task was: "*Rules and processes for collecting, storing, using and sharing data*" from a technological perspective. This very point was considered as an "artifact" to be delivered by T4.3, but soon partners realised that the better way to tackle such an action was to closely collaborate with task T2.4 and to devise a list of rules to consider whenever ASSIST-IoT platform (the software – in the form of enablers) would potentially process personal data. Partners concluded that a series of mandates should be envisioned based on GDPR and other Ethics perspectives. However, instead of tackling the issue from the "paperwork" perspective (i.e., signing informed consents, attaching GDPR articles, requesting validation etc.), this should be devised in a more agile fashion, ideally as simple instructions (accompanied by examples) so that developers will design and code enablers ensuring "ethics-compliant" collection, storage, usage and sharing of data.

Accordingly, a methodology was designed that consisted of identifying/generating those "instructions" drawing from the following elements:

- **Type**: to which action this rule/instruction refers to. It could be *collection*, *sharing*, *storage* or *usage* and the underlying principle is that any enabler performing such action type over potentially personal-related or ethic-subject data must always consider such a rule.
- **Rule**: the description of the rule *per se.*
- **Effect over enablers:** how this rule must material in terms of software development (if any). In some cases, this was not completed as the rule consisted only on procedural recommendations.
- **Rule origin**: where this rule comes from. All rules have been inspired from some document/task/activity of the project.
- **Example:** In some occasions, the rules were accompanied with examples, especially in those cases where the description was not enough auto-explanatory or some ambiguity was detected.

This redounded in the following table, which is by M18 considered the T43R artifact (according to internal naming of T4.3):

Table 9: 5. Ethical rules applying to technological enablers and ASSIST-IoT developments

Type	Rule	Effect over enablers	Rule Origin	Example
Data collection	All data sets must be inspected/analysed in order to check potential personal data inclusion	No specific development needed, the semantic enablers, due to their functionality, will cover this aspect.	D1.2	-
Data sharing	If it contains personal data, those pieces must be encrypted if exiting the scope of the enabler.	This is a functionality included within the results of T5.3 and T5.4.	D1.2, Section 2.1	Name and GPS position of a pilot of a crane must be sent to the cloud server of the port -> the data must be encrypted and only authorised users can have the private key for realising the data.
Data storage	If it contains personal data, ASSIST-IoT must be sure that the signed Informed Consent is available and OK	Falls under the scope of this task (T2.4) and this document (and D2.3) have set out enough guiding principles.	D1.2, Section 2.1	-
Data storage	If it contains personal data, each single piece of personal data must be tagged and univocally identified (id), and an interface must be put in place for always allowing the removal of that piece of data.	No specific software, this is a methodological/procedural instruction.	D1.2, Section 3.2	E.g. P1PS1BC1GPS34 (person 1, pilot site 1, business case 1, GPS position record #34)
Data storage	If it contains personal data, an interface must be put in place for always allowing the obtention of that piece of data, that will afterwards need to be provided to the Human in PDF format.	The LTSE and the Business KPI Reporting enabler already consider this option of retrieval (in various formats) and deletion if needed.	D1.2, Section 3.2	If a bluecollar worker of the construction site wants to see which personal data has been recorded of his/her (the values), ASSIST-IoT system must allow him to download them in PDF.
Data storage	If it contains personal data, those pieces must be anonymised in the scope of the enabler and outside. Personally Identifiable Information (PII) should be anonymized using appropriate anonymization methods before stored.	This is a functionality included within the results of T5.3 and T5.4.	D1.2, Section 2.1 and Section 3.3.3	The heartbeat rate of a construction worker can be useful appointed to a worker identifier, but must be untraceable to the name/other personal data of the worker.
Data collection	"Data minimisation principle" -> only the necessary information is collected.	No specific software, this is a methodological/procedural instruction. FL and edge approaches fostered by ASSIST-IoT natively aid this rule.	D1.2, Section 3.1	If the age of one person is not crucial for the service/alrogithm, that piece of data must be dismissed.
Data sharing	Only project partners that require access to the data in the context of the project needs (e.g. deliverables, reports, algorithms adjustments etc.) will be granted access to the data.	Scope of the authorisation enabler	D2.3, Section 3.4	-

Data usage	Obligation of explainability of the service to be using that data, including the results expected (e.g., inference)	Good enabler description using the template	D1.2, Section 2.1	One enabler devoted to classify the data for applying AI services must be transparent on the changes over that data. For enablers of the application plane, the AI algorithm must be properly explained (both process - not a black box - and results).
Data collection	Data captured and collected in a non-digital way will be digitalised later by the responsible Task Leader	No specific software, this is a methodological/procedural instruction	D2.1, Section 5.2	For example, in the pilot sites, reporting about sensors, about the weather, information in paper provided by a stakeholder
Data collection	Data protection will be ensured via two software-based approaches: encryption and distributed ledger technology (DLT).	When data is involved, it should be protected with enablers supporting those approaches	D2.1, Section 5.2	-
Data collection	If the data contains re-used datasets or re-used personal data, the data set must be tagged and treated according to the rest of the rules.	Semantic Repository and Semantic Annotation enabler already consider the manual and automated "tagging" of data.	D1.2 Section 3.4	Results from AI models downloaded from Kaggle, OpenML, etc.

6. Conclusion / Future Work

ASSIST-IoT seeks to create a fresh collection of IoT-related applications and tools that, in addition to technological breakthroughs, will help employees' safety, security, and productivity in a variety of transdisciplinary application situations. It will conduct a series of real-world pilot demonstrations to assess and test the performance of the proposed solutions, as well as to acquire critical information that will aid the consortium in the development of those solutions. Because human participants will be included in the pilot demonstrations, an ethical policy must be established and followed to safeguard their safety and privacy.

The current deliverable extends the initial version, which sets the foundation of the ethical and privacy guidelines, with the presentation of the updates and actions during the time between that version and the current deliverable. Major ethical concerns were addressed and stated in this document, which took into account and referenced applicable international and EU legislation and standards.

The Ethics Manager, along with the Project Coordinator and Technical Coordinator, are monitoring and examining all project activities to guarantee privacy, confidentiality, anonymity, and ethical risk management and mitigation. The purpose of this deliverable was to expand the basis set in the previous version in order to continue to support the ongoing and changing needs of the ASSIST-IoT project. Since the flow of information between the many components of ASSIST- IoT is continual and dynamic, it is critical to establish the ethical rules that govern all operations as soon as possible.

Appendix A

This project has received funding from the European's Union Horizon 2020 research innovation programme under Grant Agreement No. 957258

Architecture for Scalable, Self-human-centric, Intelligent, Secure, and Tactile next generation IoT

Informed consent

I, ☐ contractor ☐ ASSIST-IoT partner' member ☐ external participant, the undersigned, volunteer to participate in the test/pilot conducted by the **ASSIST-IoT** consortium, in the project titled "**Architecture for Scalable, Self-human-centric, Intelligent, Secure, and Tactile next generation IoT**". I confirm that (**please tick box as appropriate**):

1.	I have read and understood the information about the ASSIST-IoT project, as provided in the Information Sheet attached with this consent form.	☐
2.	I have been given the opportunity to ask questions about the ASSIST-IoT project to consider the information and have gotten satisfactory answers.	☐
3.	I understand and agree on my eligibility to be a part of this test/pilot (i.e. I am not a minor, nor I fulfil any other exclusion criteria).	☐

4.	I understand that my participation is voluntarily, and I can withdraw at any time without giving reasons and that I will not be penalised for withdrawing nor will I be questioned on why I have withdrawn.	☐
5.	In the case of withdrawing, I understand that I should not disclose and/or share any confidential information about ASSIST - IoT project that I have learned during my participation.	☐
6.	I understand that no payment of incentives and/or rewards will be made to	☐
7.	I understand the procedures regarding confidentiality and privacy as they have been explained in the Information Sheet attached with this consent form.	☐
8.	I understand that the data collected in test/pilot can be used for publications and dissemination as explained in the Information Sheet attached with this consent form.	☐
9.	I understand that the data collected in test/pilot will not be re - used for any other purposes than the original purpose of ASSIST - IoT project as explained in the Information Sheet attached with this consent form.	☐
10.	I understand that the confidentiality of data collected about me will be preserved as explained in the Information Sheet attached with this consent form.	☐
11.	I understand that my right to request access to any, and all, personal information that I have voluntarily provided as part of my participation, and that I may ask for that information to be rectified and/or amended if it is inaccurate, or request that all personal information that I have provided be deleted.	☐
12.	I understand that any requests for data access, rectification and/or deletion must be done through representative of the ASSIST - IoT joint Ethics Manager (contact details below).	☐
13.	I was informed by the ASSIST - IoT representative that in case of unexpected findings, the project consortium is obliged to inform: i) The ethical manager (…) ii) The Project Coordinator (…) iii) The European Commission via the ASSIST - IoT Project Officer I understand that the above mentioned bodies, will decide on the need, means and timing of communicating the findings to relevant stakeholders.	☐
14.	I, an external participant (……), along with the ASSIST - IoT team representative, agree to take part in the ASSIST - IoT study, and to sign and date this informed consent form.	☐

I hereby, agree to give personalized permission to ASSIST-IoT to collect, analyse and publish/report my data (when necessary) as provided in the Information Sheet and in compliance with standards and regulations.

Participant:

Name of Participant Signature Date

ASSIST-IoT team representative:

Name of representative Signature Date

Contacts information

Ethics Manager: **Contact person:** **Tel.:** **Email:**	**Local pilot representatives:**

Appendix B

This project has received funding from the European's Union Horizon 2020 research innovation programme under Grant Agreement No. 957258

Architecture for Scalable, Self-human-centric, Intelligent, Secure, and Tactile next generation IoT

Data Subject Consent Withdrawal

Full Name	

I confirm that I would like to withdraw my consent to process my personal data from ASSIST-IoT project. ASSIST-IoT project no longer has my consent to process my personal data for the purpose described in the information sheet. I expect processing will be stopped as soon as possible, however, I understand that there maybe a short delay while the withdrawal is processed by all ASSIST-IoT parties.

Signed by data subject:_____Data ___

Request obtained by: _____ ASSIST-IoT partners name ___

Signature ___

Appendix C

Ethics guidelines

The ASSIST-IoT is to comply with the ethical standards in its operation. The project's ethics manual guides the actions to accommodate participants and sets the requirements.

The ethical issues are vital to be followed by all the participants in the project throughout its whole lifecycle– before, during, but also after the pilot period in relation to knowledge exchange and impact activities (such as reporting and publication).

A set of core ethical principles are listed below providing general guidance that the winning applicants will need to follow:

1. The European GDPR law is a source for general personal data protection principles. The principles set in GDPR law should be respected by design and by default.
2. Integrity and transparency are characteristics that should be present in each aspect of the project.
3. The definition of responsibility and accountability should be set in clear lines.
4. Independence of projects should be maintained and where conflicts of interest cannot be avoided they should be made explicit.
5. Individuals and groups' rights and dignity is to be always respected in each project aspect.
6. Data subjects' rights exercise to be informed, to object, to be forgotten, and to withdraw consent should be ensured.
7. Personal data processing should be conducted in a legally way.
8. Decisions that are made solely upon automated processing of data should be avoided.
9. Processing of data that may profile data subjects should be excluded.

Please note:

The application Package currently published in ASSIST-IoT's website contains a draft Collaboration Agreement Model. This has been interpreted as a guiding template for the Collaboration Agreement that will need to be signed. ASSIST-IoT Consortium reserves the right to add minor modifications during the next month (November). A final version of the Application Package (including the definitive Collaboration Agreement) will be uploaded by December 1st, 2021.

In addition, the present guidelines cover the application to the Open Calls. The winning applicants will sign the abovementioned Collaboration Agreement with ASSIST-IoT's coordinator, defining all the necessary aspects of the project collaboration.

Privacy policy

All data collected and/or processed within the ASSIST-IoT project will need to be compliant with the GDPR regulation. In this respect, the ASSIST-IoT Open Call will involve:

1. Collection of personal and non-personal data from the open call applicant.
2. Collection and processing of deployment site-related data by the winning.

Collection of personal & non-personal data from the open call applicant

By inviting participants to submit a pilot project proposal the ASSIST-IoT Consortium will collect the participant's personal data submitted by them and process in accordance with applicable law and data protection with particular regard to the General Data Protection Regulation 2016/679 of the European Parliament and of

the Council of 27 April 2016 (infra "GDPR"). The principles of fairness, lawfulness, transparency, and integrity will be fundamental in the processing of participants' personal data, privacy and rights.

Nature of data collected

An online form "Submittable" has been created for participation in the open call. The participants are to submit their details through the online form. Through this submission, ASSIST-IoT collects personal data: family name, first name, country of residence/registration, personal email address, phone number and the relevant registration number allocated to your application.

The purpose and modalities of the processing for which the data are intended

Your personal information, referring to you as a natural person, or related to the company that you represent, is collected for the purpose of checking the eligibility for funding of the applicants and for the purpose of the obligatory reporting by ASSIST-IoT to the European Commission.

Your personal data may be processed both by digital and non-digital means, with full respect to the security measures provided by the GDPR.

Additionally, during the project period the winning applicants can be asked to participate in interviews or to contribute to communication material on their pilots. Such material, including personal data, will be published in ASSIST-IoT social media channels, the ASSIST-IoT website or communicated through relevant press releases.

Finally, the applied personal data may be used for contacting the open call participants after the end of the project, to inform them of similar initiatives and invite you to participate in novel activities. For these purposes, communication via email is probable to take place.

We take the security of your personal data seriously and we have followed a privacy-by-design architecture in order to ensure that your data is secure at all times.

The obligatory or voluntary nature of providing the requested data and the consequences of a potential refusal of providing such data

Providing your personal data for the purpose of registration and submission of your project proposal is not compulsory, yet the refusal to provide such data will preclude you from participating, as it will render you ineligible to receive the grant.

Providing your data for the promotional and marketing purposes described above is optional and requires the relevant prior consent, that you may give by clicking the checkbox in the application form on Submittable. In the absence of such consent, you can still participate in the project, however, the ASSIST-IoT Consortium cannot send you any further information about similar activities after the conclusion of the project. Your consent, once provided, can be revoked at any time for all the contact modalities (whether traditional, such as paper-based mail, or automated, such as SMS or e-mail), as well as only for one or some of them, by submitting a communication to the Data Controller, without any formality, at the following email addresses: opencall-assist-iot-eu@assist-iot.eu and iglaub@upv.es.

Entities or categories of entity to whom or which the data may be communicated, or who/which may get to know the data in their capacity as data processors or persons in charge of the processing, and the scope of dissemination of said data

ASSIST-IoT is to anonymise any personal and identifying data in the initial phase. The remaining data from the open call application will be shared with the open call reviewers, who will sign a Declaration of Absence of Conflict of Interest prior to the revision. Your proposal will be also shared with the Project Steering Board made of selected members of the ASSIST-IoT project. Any organisation involved in the revision of the open call application will be considered as Data Processors. For the purposes of the competition, if you are selected for the grant, your company name will be published on the ASSIST-IoT website together with the name of the project and funding amount (in compliance with EC guidelines for Cascading funding).

Your rights of access to, and rectification, of your data

We remind that, in your capacity of natural person, you can exercise your rights against the ASSIST-IoT Consortium at any time, in accordance with the relevant provisions of the GDPR, by sending an email without formality to opencall-assist-iot-eu@assist-iot.eu and iglaub@upv.es. It is crucial to underline that the open call participants will be the ultimate responsible for obliging and complying with the GDPR rules.

For this reason, we recommend the following:

- Applicants should make sure that decision makers and key people in their organisation are aware that the law changed to the GDPR in May 2018, and they need to understand the impact this is likely to have.
- Applicants should review the current privacy notices and put a plan in place for making any necessary changes in time for GDPR implementation.
- Applicants should proceed to review the procedures to guarantee they cover all the rights individuals have, including how you would delete personal data or provide data electronically and in a commonly used format.
- The applicants should be aware that they have to follow and have in place the necessary procedures for the detection, reporting, and investigation of any personal data breach.

References

[1.] ASSIST-IoT (2021). D2.3: Ethics and Privacy Protection Manual v1. Deliverable of the Horizon-2020 ASSIST-IoT project, Grant Agreement No. 957258.

[2.] ASSIST-IoT (2021). D3.4: Legal and Regulatory Constraints Analysis and Specification. Deliverable of the Horizon-2020 ASSIST-IoT project, Grant Agreement No. 957258.

[3.] ASSIST-IoT (2021). D1.1: H – Requirement No. 1. Deliverable of the Horizon-2020 ASSIST-IoT project, Grant Agreement No. 957258.

[4.] ASSIST-IoT (2021). D1.2: POPD – Requirement No. 2. Deliverable of the Horizon-2020 ASSIST-IoT project, Grant Agreement No. 957258.

[5.] Manpower Inc.. (2003). Inteview and recruitment guidelines. Source.