Deliverable 7.4

Ethical and legal project guidelines

	Name	Date
Prepared by:	Paolo Pallotti	07.12.2023
Checked by:	Renato Girelli	11.12.2023
Approved by:	Renato Girelli	11.12.2023

Project co-funded by the Research Fund for Coal and Steel (RFCS)

G.A. 101112102

Project details

Project Name	**Remote expert virtual system enhancing human management capabilities and favors preservation, transfer and continuous evolution of knowledge for steelmaking operation**		
Project Acronym	iSteel-Expert		
Project No.	101112102	Duration	36 months
Project Start Date	01.07.2023	Project End Date	30.06.2026

Document details

WP:	**7**	**WP Leader:**	**TENOVA**
WP Title:	Project Management and Coordination		
Task:	7.3	Task Leader:	TENOVA
Task Title:	Legal and ethical support and data access policy		
Deliverable No.	7.4		
Deliverable Title	Ethical and legal project guidelines		
Dissemination level	PU		
Written By	TENOVA		
Contributing beneficiary(ies)	SSSA		
Approved by	Renato Girelli		
Status	Final draft		
Date	11.12.2023		

Document history

Vers	DATE	AUTHOR / REVIEWER	NOTES
0.1	07.12.2023	Paolo Pallotti, Federica Merenda, Anna Loretoni, Valentina Colla	Preparation of initial version
0.2	11.12.2023	Renato Girelli	Review and approval
1.0			
1.1			
1.2			
2.0			
2.1			

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Abbreviations and acronyms

AI	Artificial Intelligence
BF	Blast Furmace
BOF	Basic Oxygen Furnace
BPMN	Business Process Model and Notation
CBR	Case-Based Reasoning
DL	Deep Learning
EAF	Electric Arc Furnace
EU	European Union
FMI	Functional Mock-up Interface
FMU	Functional Mock-up
GHG	GeenHouse Gases
HLA	High Level Architecture
HMI	Human Machine Interface
IOT	Internet Of Things
IR	Infrared
LF	Ladle Furnace
ML	Machine Learning
TRL	Technology Readiness Level

Abstract

The aim of the present document is illustrating the ethical and legal guidelines to be followed by the iSteel-Expert project partners and all the participants to the research activities.

The iSteel-Expert consortium has extensive experience in managing complex research projects for the European Commission (EC). A proper monitoring of ethical and legal issues will be carried out at each relevant stage of iSteel-Expert, to ensure that any arising risk in this context is faced in an effective and timely manner. The present document analyses the ethical and legal framework upon which such monitoring is based and explains ways and means to implement it.

1 Introduction

iSteel-Expert project aims at implement and demonstrate in an industrial environment a remote expert virtual system, able to monitor events and suggest actions, minimizing the need of human presence in critical areas around the furnace in the melting area of a steel plant. The system, based on IOT implementation, is designed to build a comprehensive, pre-analysed, augmented set of information from which descend the most suitable actions for the improvement of process control, safety of the equipment, supporting standard and maintenance operations.

Enhancing human management capabilities, detecting and standardizing relevant events and their consequences, the system prevents the loss of individual knowledge through the implementation of knowledge-based tool that works integrated in an interactive training tool, which favors preservation, transfer and continuous evolution of the industry's wealth of knowledge.

1.1 Purpose of the present document

The iSteel-Expert consortium places a strong emphasis on investigating and designing procedures and protocols necessary for handling legal and ethical issues which might arise during the whole project lifetime as well as in monitoring the proper implementation.

This report illustrates the ethical and legal guidelines to be followed by the project partners and all the participants to the research activities. In this context, it includes the experience and lessons learned from previous research projects performed by the iSteel-Expert consortium members.

The consortium has extensive experience in managing complex research projects for the European Commission (EC). A proper monitoring of ethical and legal issues will be carried out at each relevant stage of iSteel-Expert, to ensure that any arising risk in this context is faced in an effective and timely manner. The present document analyses the ethical and legal framework upon which such monitoring is based and explains way and means to implement it.

1.2 Scope of application

All the activities developed within iSteel-Expert must comply with ethical principles, applicable international, European and national regulations. This implies that the iSteel-Expert consortium is fully committed to ensure respect for people and for human dignity as well as an appropriate and fair distribution of the benefits and obligations deriving from the research activity.

The iSteel-Expert Consortium commits itself to protect the values, rights, and interests of all research participants. Moreover, in all the situations in which this is relevant, iSteel-Expert partners must obtain any necessary ethics approvals, and the free and fully informed consent of any person who takes part to the research activity at any level.

iSteel-Expert needs to ensure that the research methodologies that are adopted within its framework do not result in discriminatory practices or unfair treatment, by complying with the overall principle of maximizing benefits and minimizing risks and harms.

Furthermore, for those activities which imply the development of surveys, interviews, brainstorming and training procedures where personal information is gathered and stored, all the project beneficiaries must comply with all the regulations and good practices concerning privacy, data protection, data management, and the health and safety of participants.

In the framework of implementing any research that fits the above description, iSteel-Expert fully adopts and applies all the ethical requirements introduced by the European Commission.

With that in mind, the present deliverable describes measures and procedures, through which an ethically compliant implementation of the project activities is ensured and monitored.

1.3 Structure of the document

This document is divided into 8 main sections:

- Section 1 introduces the context of this document and its objectives.
- Section 2 introduces the ethical and legal framework in which the project is developed by also analyzing in depth the main ethical issues and principles inspiring research activities that are funded by the EU.
- Section 3 describes the main ethical dimension and potential ethical issues identified so far for iSteel-Expert.
- Section 4 analyses the main aspects related to human participation in research activities.
- Section 5 overviews the basic rules and procedures that will be followed to protect personal data.
- Section 6 shortly overviews the policy of the project concerning the adoption of an inclusive language.
- Section 7 provides an overview of the profile of the appointed Ethics Mentor and its role within the project.

2 Analysis of ethical and legal framework

2.1 Legal framework on ethics in the Grant Agreement for RFCS Projects

In the Grant Agreement of iSteel-Expert, ethics is treated in Article 14 and Annex 5, which states as follows:

> The beneficiaries must carry out the action in compliance with:
>
> - ethical principles (including the highest standards of research integrity)
>
> and
>
> - applicable EU, international and national law, including the EU Charter of Fundamental Rights and the European Convention for the Protection of Human Rights and Fundamental Freedoms and its Supplementary Protocols
>
> No funding can be granted, within or outside the EU, for activities that are prohibited in all Member States. No funding can be granted in a Member State for an activity which is forbidden in that Member State.
>
> The beneficiaries must pay particular attention 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 persons, the right to non-discrimination, the need to ensure protection of the environment and high levels of human health protection.
>
> The beneficiaries must ensure that the activities under the action have an exclusive focus on civil applications.

Other parts of the same article and annex refer to research on human embryos or human embryonic stem cells, which in clearly out of the scope of the iSteel-Expert project.

In addition, the beneficiaries must respect the fundamental principle of research integrity as set out in the European Code of Conduct for Research Integrity [1], which will be analyzed in deeper detail in the next Subsection.

2.2 Generic ethical issues and principles in research

2.2.1 Ethics in research

The term research ethics is a general concept that covers all the ethical viewpoints and evaluations that are related to science and research. Ethics are norms of conduct that distinguish between acceptable and unacceptable behavior. As people can interpret ethical norms in different ways in the light of their own values and life experiences, it is necessary to establish common definitions and rules in the framework of the project.

In iSteel-Expert, 'ethics' is perceived as earlier defined by the European Commission [2]. According to the EC (see [2], page 2):

"The consideration of ethical issues, starting at the conceptual stage of a proposal, enhances the quality of research, increases its likely social impact, promotes research integrity, promotes a better alignment of research with social needs and expectations and, finally, supports the societal uptake of the fruits of research because high ethical standards generally merit public trust. In this spirit, the Commission aims to build a relationship between the research process and ethics that is collaborative and constructive (rather than negative and inhibitive)."

The iSteel-Expert consortium acts in line with this notion and sees research ethics as the vital basis for conducting high-quality research. In particular, the ethical norms sustained in iSteel-Expert are **Impartiality**, **Reliability**, **Integrity**, and **Responsibility**. These norms stress the importance of good and responsible practices and lay the foundations for sincere, reliable, and confidential cooperation among the consortium members and other stakeholders. The norms are closely tied with the notion of research integrity which is addressed next.

2.2.2 Research integrity

In addition to research ethics, good research practices are based on fundamental principles of research integrity. Research integrity emphasizes the honesty and integrity that all researchers are required to adopt in their research activities. The research integrity principles guide researchers in their work as well as in their engagement with the practical, ethical, and intellectual challenges inherent in research.

The beneficiaries are committed to respecting the fundamental principle of research integrity as set out in the European Code of Conduct for Research Integrity [1] document provided by ALLEA - All European Academies - group. The document states that "good research practices are based on fundamental principles of research integrity. They guide researchers in their work as well as in their engagement with the practical, ethical, and intellectual challenges inherent in research" (see [1], page 4).

According to the European Code of Conduct for Research Integrity, the fundamental principles of research integrity are the ones reported in Article 14 and Annex 5 of the Grant Agreement, which are reported below for the sake of clarity:

- **reliability** in ensuring the quality of research reflected in the design, the methodology, the analysis, and the use of resources
- **honesty** in developing, undertaking, reviewing, reporting, and communicating research in a transparent, fair, full, and unbiased way
- **respect for colleagues**, research participants, society, ecosystems, cultural heritage, and the environment
- **accountability** for the research from idea to publication, for its management and organization, for training, supervision, and mentoring, and for its wider impacts.

This means that beneficiaries must ensure that persons carrying out research tasks follow the good research practices including ensuring, where possible, openness, reproducibility and traceability and refrain from the research integrity violations described in the Code.

In addition to the European Code of Conduct for Research Integrity, the beneficiaries must follow other relevant international and national research integrity guidelines.

2.2.3 Contexts of ethical research practices

Good research practices – which are based on the previously addressed research ethics and research integrity – apply to different contexts of the project's processes. These contexts are defined by ALLEA as follows:

- Research Environment
- Training, Supervision and Mentoring
- Research Procedures
- Safeguards
- Data Practices and Management
- Collaborative Working
- Publication and Dissemination
- Reviewing, Evaluating and Editing

Continuous supervision and guidance are done by the management of the project with the support of a nominated Ethics Mentor to ensure that good research practices are sustained in all these contexts. Notably, all participating organizations as well as individual researchers and management staff are responsible for following good research practices. This includes reporting of any misconduct that might be detected.

2.2.4 Notes on communication, publication, and dissemination activities

The general communication and dissemination principles of iSteel-Expert are based by design on high ethical conduct. The strategy to implement dissemination and communication are addressed in depth

in *Deliverable 6.2 "Communication and dissemination Plan*" which was submitted in September 2023. The redaction of official communication and dissemination material and documents follows the same qualitative rules and procedures that are applied to any kind of official document originated by the project, which are defined in the *Deliverable 7.2* "*Project Management Plan*" submitted in August 2023. Therefore, in this subsection, we limit to mention a few core notes on ethics in communication and dissemination activities of the project.

First, the researchers involved in iSteel-Expert are committed to agreeing on the sequence of authorship, acknowledging that authorship itself is based on a significant contribution to the design of the research, relevant data collection, or the analysis or interpretation of the results. The consortium members must acknowledge the work and intellectual contributions of others, including collaborators, assistants, and funders.

Second, the researchers acknowledge that they are fully responsible for the content of a publication, unless otherwise specified. The authors should ensure that their work is made available to colleagues in a timely, open, transparent, and accurate manner, unless otherwise agreed. They must also be honest in their communication with the general public and in the media. Moreover, the researchers involved in iSteel-Expert are committed to disclosing any conflicts of interest and financial or other types of support for the research or for the publication of its results [3].

2.2.5 Research misconduct and other unacceptable practices

The iSteel-Expert consortium has a zero-tolerance policy for research misconduct, disregard for responsible conduct of research and other unacceptable practices in research.

- Research misconduct can be, for example (the list is not exhaustive),
- fabrication, i.e., making up results and recording them as if they were real.
- falsification, i.e., manipulating research materials, equipment or processes or changing, omitting, or suppressing data or results without justification.
- plagiarism, i.e., using other people's work and ideas without giving proper credit to the original source, thus violating the rights of the original author(s) to their intellectual outputs.
- misappropriation, i.e., unlawful presentation of another person's result, idea, plan, observation, or data as one's own research.

Sometimes, research violations are not as distinct in which cases they can be seen as disregarding the responsible conduct of research. Examples of these can be (the list is not exhaustive):

- denigrating the role of other researchers in publications
- reporting results and methods in a careless manner, resulting in misleading claims
- inadequate record keeping and storage of results and data
- publishing the same results many times as novel results (self-plagiarism)
- misleading the research community in other ways.

In addition, there are other unacceptable research practices which are condemned. These can be, for instance,

- manipulating authorship
- exaggerating one's own achievements (e.g., in CV)
- re-publishing substantive parts of one's own earlier publications without duly acknowledging it ('self-plagiarism')
- citing selectively to enhance own findings or to please editors, reviewers, or colleagues
- withholding research results
- delaying the work of other researchers e.g., in the peer-review process
- allowing funders/sponsors to jeopardize independence in the research process or reporting of results
- accusing a researcher of misconduct or other violations in a malicious way
- exaggerating the importance and practical applicability of findings

To prevent any kind of misconduct, disregard, or other unacceptable practice to take place, the iSteel-Expert consortium expects responsible conduct from all its researchers and implements clear ethics monitoring processes.

3 Main ethical dimensions and issues in iSteel-Expert

iSteel-Expert employs Artificial Intelligence systems to support, complement and extend the awareness and the sensing capabilities of human operators and to allow the preservation of company's know-how, with positive impacts also on the safety of workers by materially decreasing the time spent by workers in dangerous areas of the plant.

iSteel-Expert benefits from an extensive application of different AI approaches for various tasks:

• Pre-processing and relevant features extraction from images taken from cameras and data collected from acoustic sensors (to this aim, state-of-the-art ML and DL techniques will be applied, such as, for instance, Convolutional Neural Networks - CNN - for image processing, CNN coupled to Wavelet Transforms - WT, Wavelet Networks - WN - and Long-Short Term Memories - LSTM - for acoustic data processing).

• Refinement of the logics for events detection and identification of corrective actions.

The project will also exploit the data and information collected from the field to improve and refine the strategies for events detection and identification of corrective actions, including capitalization of expert personnel's know-how, which can be implemented through approaches such as Case-Based Reasoning (CBR), that will give the end-users the possibility to incorporate their own knowledge into the system by validating its suggestions or correcting them.

In parallel, iSteel-Expert will develop an interactive immersive simulation tool with educational and training purposes based on the Industry 4.0 paradigm. The simulator can be considered a digital twin devoted to training instead of decision making in plant operation. Within the project, the partners will develop "Educational Models for Electric Arc Furnace Operations Training" implemented in a 3D environment: data and KPI will be integrated in the models. Two types of data will be used: initially data collected during experimentation, used to verify and validate the models; subsequently data used in training operation, to improve the model, based on a procedure to dynamically readjust them as the training sessions expand and evolve. The model will be designed to train users in specific tasks and troubleshooting situations related to EAF steel production, integrating the EAF simulator with other material devoted to support the training, such as videos, multimedia content, and case studies.

At the proposal and negotiation stages no ethical issues have been identified concerning objectives of the activity, methodology, and potential impacts.

On the one hand, the research work that is being developed in iSteel-Expert is not aimed at tracking individuals, recognition or collection of personal data, as monitoring systems are exclusively devoted to surveillance of the EAF processes and therefore do not raise ethical concerns related to human rights and values.

On the other hand, the systems to be developed in iSteel-Expert will include the possibility to detect the presence of humans in the neighborhoods of the EAF, and will also be used to train and upskill workers, with potential impacts on personal data privacy and labor laws.

All these aspects will be carefully dealt with during the project, as better described below.

3.1 Compliance with ethical principles and relevant legislations

All participants of iSteel-Expert are committed to the responsible professional principles and codes of conduct and will conform to the current legislation and regulations in the countries where the development and innovation actions will be carried out. The consortium is committed to rigorously apply Ethical standards and guidelines of RFCS (which are completely in line with those of Horizon Europe - HEU) in all work regardless of the country in which the research/demonstration is carried out. The project complies with the Charter of Fundamental Rights of the EU. We subscribe to the requirements within HEU to deal with ethical issues following the regulation (EU) 2021/695 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL, Article 19 (1): "Actions carried out under the Programme shall comply with ethical principles and relevant Union, national and international law, including the Charter and the European Convention for the Protection of Human Rights and Fundamental Freedoms and its Supplementary Protocols. Particular attention shall be paid to the principle of proportionality, to 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 to the need to ensure protection of the environment and high levels of human health protection." ISteel-Expert will follow international and national ethics guidelines. Particular attention will be paid to complying to the EU's General Data Protection Regulation (GDPR) Regulation (EU) 2016/679, 27 April 2016, which supersedes the Data Protection Directive 95/46/EC as of May 2018 as the primary law regulating how organizations protect EU citizens' personal data; with the EU's E-Privacy Directive 2002/58 on Privacy

and Electronic Communications; and with Commission decisions on the adequacy of the protection of personal data in third countries, as well as Privacy Shield that supersedes International Safe Harbour Privacy Principles as of 2015.

Moreover, the iSteel-Expert Consortium has defined basic principles to drive human participation in research activities as well as hints for a fair and ethical communication among participants using inclusive language.

In the next sections the plans and procedures for handling the identified ethical aspects are described.

Moreover, to drive the actions of the Consortium as well as to monitor and timely identify emerging ethical issues which are not foreseen at the present stage, the Consortium has appointed an ethics mentor to help with ensuring activities comply with ethical and legal requirements for research, especially (but not exclusively) with humans and personal data processing.

3.2 Compliance with the Artificial Intelligence Act

The Artificial Intelligence systems employed in the iSteel-Expert Project do not fall in the category of prohibited artificial intelligence practices identified under Article 5 of the *Regulation of the European Parliament and of the Council laying down harmonized rules on Artificial Intelligence and amending certain union legislative acts (Artificial Intelligence Act)* nor they constitute high-risk artificial intelligence systems under Article 6 of the same Regulation.

In particular, the AI systems employed in the iSteel-Expert project are not intended to be used for the 'real-time' and 'post' remote biometric identification of natural persons (Annex III, 1(a)) nor they are intended to be used for recruitment or selection of natural persons, notably for advertising vacancies, screening or filtering applications, evaluating candidates in the course of interviews or tests or used for making decisions on promotion and termination of work-related contractual relationships, for task allocation and for monitoring and evaluating performance and behavior of persons in such relationships (Annex III, 4(a)(b)).

iSteel-Expert will ensure that the AI systems employed comply with Article 52 of the Artificial Intelligence Act concerning transparency obligations, particularly by ensuring that AI systems intended to interact with natural persons are designed and developed in such a way that natural persons are informed that they are interacting with an AI system.

As a further caution, considering that the Artificial Intelligence Act is at the stage of proposal as the present document is being prepared, the iSteel-Expert partners will make sure that relevant changes in the proposed policy will be reflected in the AI systems to be implemented within the project.

4 Human participation in research activities

To achieve its ambitious objectives, iSteel-Expert will involve researchers and operators working with different roles in the EAF area and will consider aspects related to the digital transition of the steel sector, for instance as far as simulation and optimized digital control is concerned. Therefore, the project also needs to ensure acceptance and awareness of this digital approaches and tools as well as to achieve a comprehensive understanding of the requirements and needs of those people to embrace these approaches.

Furthermore, iSteel-Expert will analyze directly with workers involved in the project the real scenarios and barriers to contribute to a smooth transition towards these advanced digital tools.

A specific assessment will be performed by SSSA (DIRPOLIS institute) concerning the degree of acceptance of the whole system by the personnel e.g., through interviews and participation to the first training courses. The investigation will also be extended to all the personnel of the EAF area, to fully understand the workers' perception of the impacts on their daily operating practices and wellbeing in general of the introduced system.

Workers are therefore a key part of the deployment of the iSteel-Expert project. Data in specific issues (related mainly with work skills in digital technologies and digitization of the EAF operations) will be analyzed in WP 5. The design and development of the study will take into account all the requirements to grant compliance with all ethical and data protection issues, fulfilling also the applicable ethical standards.

4.1 Recruitment, inclusion and exclusion criteria

The people involved in the iSteel-Expert project will be volunteers.

Mostly, the involved people will be EAF professionals and EAF trainees within SIDER organization (and indicated by SIDER).

Possibly, the group will include students and graduates of the International Master in Industrial Plant Engineering & Technologies (MIPET) to be involved in WP4 by the subcontractor UNIGE.

Wherever applicable, the involved steelwork will analyze the actual skills and work procedures of the workers, and some of them will be asked to participate in the project experimental stages.

All the involved people will be asked for their informed consent to participate in iSteel-Expert. Presently, no exclusion criteria have been defined, but if they do arise during the execution of the project, then the consortium will act upon them at that time.

4.2 Informed consent procedure

In any of the research taking place in iSteel-Expert that involves humans, potential participants will undergo an appropriately-designed informed consent procedure implemented by project partners in compliance with the ethical requirements set forth by the Commission as well as with relevant EU and national legislation.

The consortium will prepare a form/survey template in which the selected persons will be duly informed about the project aims and the Protection Data rules followed by the project. The form will be prepared in the languages of the nations where the specific activities and/or analyses will take place, and the persons will better understand the particularities of their participation in the project. The form will include a box to be marked with the sentence "*I consent to be involved in the iSteel-Expert project*" or similar. The worker will be asked to sign the form before participating in the work of the project.

The informed consent procedure will start by providing potential participants with an information sheet, which includes sufficiently detailed information on the research at hand, so that they can make an informed, voluntary and rational decision to participate. More specifically, the information sheet handed to research participants will contain:

- a commonly understandable written description of the project and its objectives;
- sufficiently detailed information on the purposes of the analysis.

After reading the information sheet, to ensure that potential participants have fully understood the scope of their participation, they will be asked to provide their consent in writing by signing the informed consent form which:

- Highlights the need to read the information sheet carefully, to fully understand why the research is being carried out and what it will involve for them before deciding to participate.
- Explicitly states that their participation in the research is entirely voluntary and that they have the right to refuse to participate and to withdraw their participation at any time without needing to justify their decision.
- Explains that the data collected may be used in reports and other publications about the project
- Declares that any personal data they may provide in the framework of their participation will be handled in accordance with GDPR, as well as any relevant national laws (see also Section 5).
- Provides the contact details of the responsible project partner that they can communicate with to address any complaints, concerns or simply further questions that may arise from their participation in the research.

The project partner that engages the participants and seeks to receive their informed consent will be responsible for ensuring that the informed consent form is not signed and provided under any form of duress. Both the participant and the responsible project partner will sign the informed consent form and keep a copy of it, concluding the informed consent procedure and proceeding to the implementation of the research.

5 Protection of personal data

5.1 Definition of personal data

"*Personal data*" means information relating to an identified or identifiable natural person. An identifiable natural person is one who can be identified, directly or indirectly, in particular by reference to an identifier such as a name, an identification number, location data, an online identifier or to one or more factors specific to the physical, physiological, genetic, mental, economic, cultural or social identity of that natural person (art. 2(a) EU General Data Protection Regulation (GDPR).

In accordance with the General Data Protection Regulation (GDPR) (Article 4 (13), (14) and (15) and Article 9 and Recitals (51) to (56) the following personal data are considered "sensitive" and are subject to specific processing conditions:

- personal data revealing racial or ethnic origin, political opinions, religious or philosophical beliefs
- trade-union membership
- genetic data, biometric data processed solely to identify a human being
- health-related data
- data concerning a person's sex life or sexual orientation.

As such, iSteel-Expert will ensure that the rules regarding the processing of such sensitive personal data outlined in the GDPR are followed, particularly in Article 9.

"*Processing of personal data*" means any operation (or set of operations) performed on personal data, either manually or by automatic means. This includes:

- collection (digital audio recording, digital video caption, etc.)
- recording
- organization, structuring & storage (cloud, LAN or WAN servers)
- adaptation or alteration (merging sets, application, etc.)
- retrieval & consultation
- use
- disclosure by transmission, dissemination or otherwise making available (share, exchange, transfer)
- alignment or combination
- restriction, erasure or destruction.

5.2 Justification for the processing of sensitive personal data

Due to the scope of the project, in general personal data are not required to develop the core research activities foreseen in the project. Nonetheless, the iSteel-Expert Consortium is aware that personal data may come from any type of research activity, such as, for instance, ICT research, personal records (financial, criminal, education, etc.), gender and ethnic background, location tracking and domicile information, etc. Therefore, the iSteel-Expert Consortium decided to anticipate the potential generation on ethics issues on this topic, by trying to identify activities where personal data might even accidentally be provided by participants and/or where personal data might somehow "enrich" the analysis, such as, for instance, the assessment of the social and environmental impact of the developed solutions, to be prepared to face any kind of ethic issue which might arise. Table 2 summarizes the outcome of the analysis developed at the present stage.

Table 1: List of activities where sensitive personal data might accidentally be collected and/or where their provision might be decided at a later stage within iSteel-Expert.

WP	Type of data	Ethical / Legal Restrictions
WP1	The set of KPI used within the project will include: - human presence in the vicinity of the process, used to assess the human exposure during the phases of the process, compliance of the operator with respect to the established procedures, and timing of required activities; - rate of required presence of the personnel in the EAF area (percentage of the operating time); - required training time for the personnel.	Anonymisation (see below)
WP5	In the assessment to be performed by SSSA concerning the degree of acceptance of the whole system by the personnel e.g., through interviews and participation to the first training courses, personal data might be collected, including information on: age, sex, role, education and cultural background, expectations and opinions related to the development of the iSteel-Expert technologies.	Anonymisation (see below)
WP6	Personal data might be collected during the workshops and / or symposia to be organized by project partners (data may include personal contacts of participants)	Informed consent according to GDPR

All information will be shared in a manner that would not enable to identify the participants directly or indirectly. To ensure this, partners will apply the principle and methodology of anonymization, including removing any details that could lead others to identify any participant.

In particular, for the detection of human presence in specific areas of the plant, no identification whatsoever will be performed: only anonymous elements will be detected, such as the colour of helmets or overalls in order to reveal only the category of the involved workers.

5.3 Consent for personal data processing

When data processing is based on the consent given by the data subject, the controller is obligated to demonstrate that such consent for a specific purpose is given, in compliance with the principle of purpose limitation established by the GDPR (art.5(b)). If the purpose changes, new consent must be acquired for the new purpose from the individual. The withdrawal of the consent should be as easy as giving the consent.

Personnel involved in the provision of data and information which can be partly classified as sensitive personal data will be required to sign an Informed Consent form, that will be prepared in the native language by their Company/Institution according to the principles and procedures described in Section 4.2.

6 Inclusive language

Speaking and writing are actions that not only depict but can also shape reality. When we express things in a specific manner, we generate mental pictures or strengthen existing ones. According to [4], language mirrors our beliefs, whether apparent or concealed, and influences individuals' beliefs about what is acceptable or customary. Particularly when referring to individuals or communities, this has significant consequences since language may perpetuate pre-existing discriminatory biases and prejudices [5]. Therefore, it is paramount to use inclusive language while preparing iSteel-Expert materials, events and in all communication activities, either internal or external.

Inclusive language is sensitive, non-discriminative, and treats everyone equally by choices of word, tone of speech and manner of conversation. The use of inclusive language is crucial in creating environments that are respectful, psychologically safe, and welcoming to all individuals [6]. By using inclusive language both internally and externally, consortium members can signal to colleagues, external partners, and general audience that they are accepted and valued as they are.

Figure 1 provides a schematic overview of the pillars of the importance of inclusive language.

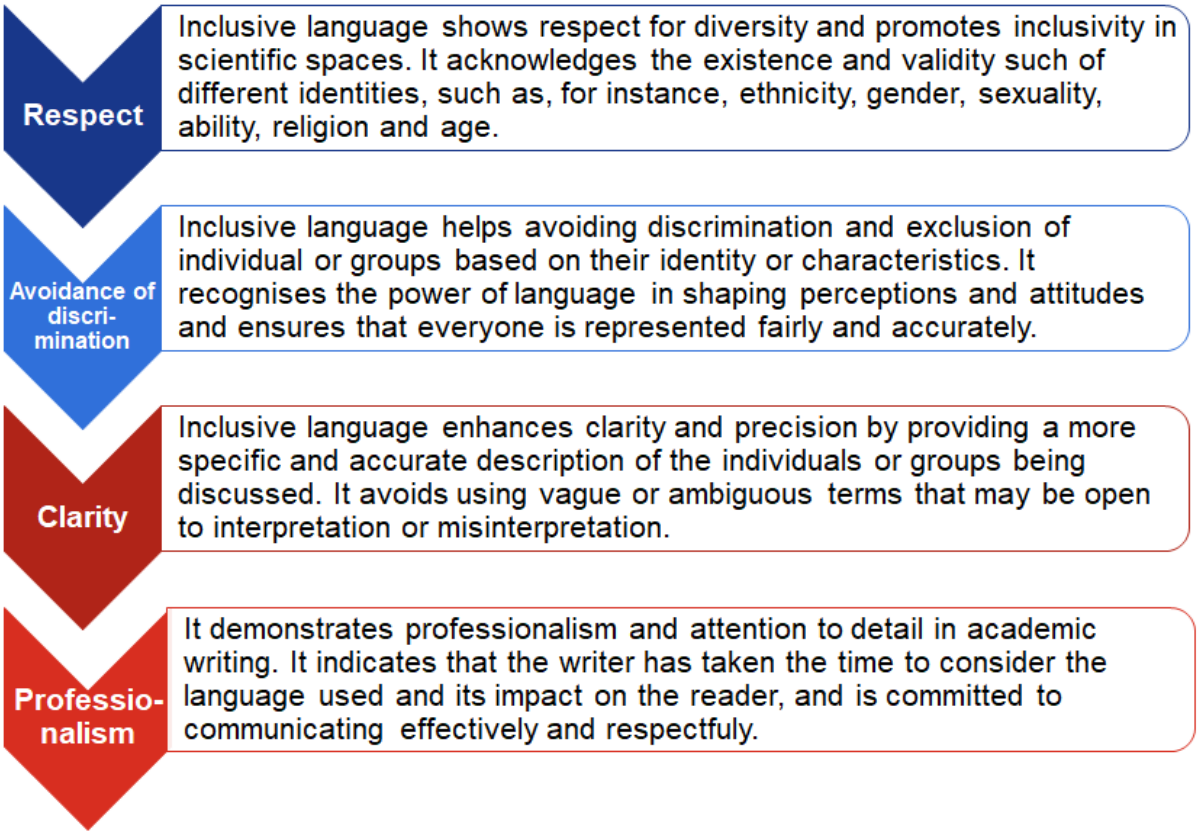

Figure 1: The importance of inclusive language.

In practice, inclusive language is about using people-centered language that refers to a person's characteristics, such as gender or ethnicity, only when relevant to the context. For instance, when discussing research personnel, it is best to refer to them by their last name and professional title rather than their marital status (Mr., Mrs., or Ms.), and to avoid assuming their gender pronouns. Moreover, in case of questionnaires, where the respondent is asked to indicate sex and gender, the options "*prefer not to say*" and "*not binary*" must always been provided. This approach helps to avoid making assumptions and promotes a more inclusive and respectful dialogue.

Overall, using inclusive language in research and innovation practice is an important way to promote equity, respect, and fairness, and to ensure that everyone (beyond the consortium group) is represented accurately and with dignity.

7 Ethics mentor

The Consortium appointed an Ethics Mentor (EM) for the project to help with ensuring activities comply with ethical and legal requirements for re-search with humans and personal data processing. The iSteel-Expert EM is Prof. Anna Loretoni, full professor of Political Philosophy of Scuola Superiore Sant'Anna.

7.1 Curriculum Vitae and experiences of the ISteel-Expert Ethics Mentor

Anna Loretoni is Full Professor of Political Philosophy at Sant'Anna School of Advanced Studies (DirPolis Institute), where she is also Dean of the Department of Social Sciences. She is the Principal Investigator of several EU funded and nationally funded projects, namely 2022-2025 CERV-Daphne Project ENGINE - *Engaging Men and Boys against Gender-based Violence and Discrimination through Technology-based Trainings* and PRO3 2021-2023 Scuola Sant'Anna-SNS, "*Sostenibilità sociale e diseguaglianze di genere: cultura, politica, economia*" (In English "*Social sustainability and gender inequalities: culture, politics, economy*").

Prof. Loretoni has a long-standing experience and publication record in top-ranked journals on several issues in political philosophy, including gender studies, international order theory, political identity, European constitutionalization and human rights. Among Her publications, the following books are available: "*Ampliare lo sguardo. Genere e teoria politica"* (in English "*Broaden your gaze. Gender and political theory* - Donzelli Ed., 2014, ISBN: 9788868430887)", "Teorie della pace. Teorie della guerra" (in English "*Theories of peace. Theories of war*" ETS Ed. 2005, EAN 9788846712912), "*Pace e progresso in Kant*" (in English "*Peace and progress in Kant*" ESI Ed. ISBN 8881143607, 1996).

7.2 Role of the Ethics Mentor in the project

The Ethics Mentor is an individual ethics expert providing ethics guidance and advice on issues of ethical gravity that relate to the planned and/or ongoing research.

The Ethics Mentor will assess the ethical merits of the work performed by the Beneficiary/ies, give independent recommendations, and, if required, report to the Commission / Agency / Funding Body on the project's compliance.

Where appropriate, the Ethics Mentor can give advice on approval requirements, risk-benefit assessments, guidance on specific ethical questions and guidance concerning the relevant legal framework and regulatory requirements in the countries where the research takes place.

The Ethics Mentor will maintain an overview of operations throughout the project, helping with preparation in terms of thinking ahead about possible problems and how they can be addressed.

The Ethics Mentor will do whatever is necessary to diligently monitor the aims, objectives, methodology and implications of the research to ensure that it conforms to the highest ethical standards, thereby assisting in ensuring that researchers, research participants nor the general public

are exposed, by the work of the project, to activities that would be considered to be ethically unacceptable or even prohibited.

The societal implications of the project will be also considered to be relevant to ethics oversight.

8 References

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[3] ICMJE. (2023). Defining the Role of Authors and Contributors. https://www.icmje.org/recommendations/browse/roles-and-responsibilities/defining-the-role-of-authors-and-contributors.html

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[5] United Nations. (2023). Gender-inclusive language. https://www.un.org/en/gender-inclusive-language/

[6] APA. (2021). Equity, Diversity, and Inclusion: Inclusive Language Guidelines. https://www.apa.org/about/apa/equity-diversity-inclusion/language-guidelines.pdf