European Journal for Security Research (2023) 8:5–23
https://doi.org/10.1007/s41125-023-00096-0

ORIGINAL ARTICLE

Research Ethics and Ethical Research: An Example of Integrating Ethics in R&I Research

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Received: 11 May 2023 / Accepted: 3 November 2023 / Published online: 27 January 2024

Abstract

The role of ethics in research and innovation projects (R&I) has become much more important in recent decades. Particularly, security-related research is required to reflect on normative issues within the research process. At the same time, the form in which ethics is addressed differs greatly. This is not only due to different research agendas (e.g. ethics as an evaluation criterion of research or a research endeavour in itself) and aims (e.g. technology development, social or medical research) but also because of different perceptions with regard to the role of ethics within the research project (e.g. ethics as an external standard to comply with or ethics as a research strand within an interdisciplinary research project). As differences in the level of ethical reflection are not problematic as such, but might be rooted in the specific research interest itself, it might be difficult for those in charge of performing ethical research in R&I projects to develop ethics research designs for new projects. Focussing on security research, we present in this contribution, how ethics was included into the work performed in a trans- and interdisciplinary EU research project. Thereby, four levels of ethical reflection are distinguished and illustrated with examples. These levels can be subsumed under the categories *research ethics* and *ethical research*. The paper is intended as one example of how ethics can be integrated into security-related research, which might and should be complemented with other approaches in order to help researchers developing an ethical inventory of procedures to conduct ethical research in security domain.

Keywords Ethics · ELSI · Research methods · Disaster management · Security research

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1 Introduction

The role of ethics in research and innovation funding strategies has become much more important in the last decades. Originating mainly in bioethics and technology assessment, the whole process of technology development has become increasingly imbued with ethical considerations. At the core of this process is the insight that ethical, legal, and social considerations should be integrated into research and innovation processes right from the beginning, rather than taking up an ethical, legal, or social perspective only ex-post to evaluate an already developed or implemented technology. This approach—most famously known by the abbreviation ELSI (ethical, legal, and social implications)—took hold in almost every research grant and its consideration has become key for most funding schemes (Rodriguez et al. 2013). ELSI is a complex inter- and at times even transdisciplinary process in itself. Therefore, we will focus specifically on the E in ELSI and suggest an approach to systematically assess the ethical implications of a research project.

There are manifold forms in which ethics can be addressed within research projects. This is not only due to different research agendas (e.g. ethics as an evaluation criterion or ethical questions as a research endeavour in itself) and aims (e.g. technology development, social or medical research) but also because of the different roles ethics may take in the research process (e.g. ethics as an external standard to comply with or research strand within an interdisciplinary research project) (Düwell 2015; Matzner and Ammicht Quinn 2016; Viseu 2015; Mahoney et al. 2022; Leese et al. 2019). Developing lists of tick boxes might provide a formal and standardized tool of fostering a baseline of reflection. However, especially empirical project tasks might require a more substantial engagement, e.g. through an ethics monitoring during the whole project life cycle. An even more substantial engagement with ethics can be achieved by including ethical research questions referring to underlying values within the research process as well as the technology or strategy to be developed. Such a substantiated understanding of ethics exceeds the understanding of ethics as a service and makes it a research goal in its own. Along with these different levels of ethical reflection, there are different methodological and structural challenges when performing ethical research in R&I projects (Spindler et al. 2020: 216; Mahoney et al. 2022; Leese et al. 2019). Consequentially, the level and way of ethical reflection vary from project to project. Although this diversity of ethics frameworks is not problematic as such, but can be justified by the specific research interest of a given project, it might be difficult for those in charge of performing ethical research in an R&I project (especially for researchers from other disciplines) to develop an appropriate ethics research design for new projects.

Against this backdrop, we present in this contribution one example of how ethics can be included into R&I projects. These reflections might serve as a starting point for developing an ethical inventory of procedures for integrating ethics into research activities and as an orientation for those responsible for considering ethical questions. In this text, examples of specific methods will be presented

and linked to a broader fourfold understanding on the role of ethics in research and development projects, which can be roughly distinguished in two categories: *research ethics* and *ethical research*. This contribution builds on the rich basis of methods of ethical decision-making, technology assessment, as well as structured approaches for the identification of potential negative side-effects. We thus present one possible approach to integrate ethics in (security-related) research, rather than a one-size-fits-all solution. The presented approach was developed over the course of several research projects. At the same time, the variety of different approaches to integrating ethics in collaborative projects reflect the contextuality of ethics research (see, for instance, PERCEPTIONS [Horizon 2020] (Mahoney et al. 2022), XP-DITE [FP7] (XP-Dite 2017) or Leese et al. 2019). Although we developed the following contribution in the field of security-related ethical questions, the approach outlined is not necessarily limited to security research.

This article is structured into five parts. The following section will outline the understanding of ethics which underlies our research design used in the BuildERS project. In the third section, along the distinction of four levels of ethical reflection, concrete examples from the BuildERS project are presented and scrutinized with regard to their potentials and limitations within the project work. In addition, the fourth section emphasizes structural challenges of employing ethics in research projects. Eventually, the contribution closes with a conclusion and outlook.

2 The (Role of the) Ethical Perspective in R&I Projects

The ethics research design which we used in the BuildERS project built on the understanding of ethics as the reflection on moral attitudes and judgments (Pieper 2007: 60). Moral judgments are stances that refer to values that should be reached or realized. Most prominently, this is to be found in answers to the questions "What is a good action in a certain situation?" or "What is considered an aspect of a good life?" (Friesen and Berr 2004). The answers to these questions represent the moral beliefs of an entity such as an individual, organization, or society. Moral beliefs refer to value-related evaluations of living conditions, behaviour, or social expectations of normality (Pieper 2007: 42; Zack 2011: xxvii–xxxi).

Ethics in this understanding is about discussing and evaluating moral beliefs and arguments on how to act in a certain situation or what to aim for in a specific context. Evaluating the legitimating power that a moral judgment might have refers to an intersubjective level of argumentation. It is about scrutinizing if arguments have validity beyond a mere personal point of view (Ammicht Quinn 2014: 38, Morscher et al 1998: xi). To illustrate this, we might think of the question of how to distribute scarce goods. Discussing this as an ethical question[1] would mean evaluating and formulating arguments on "What values should be realized through a distribution?". If, for instance, it is argued that goods should be distributed in a "just" way, it can be scrutinized what "justice" refers to and how this is deemed to be a desirable aim. As

[1] In contrast, for instance, a logistical (e.g. "Which strategies or devices should be used to distribute goods in an efficient way?") or legal question (e.g. "Which laws have to be considered when goods are distributed?") on the distribution of goods.

different moral beliefs exist, such an ethical perspective aims at weighing different moral beliefs and associated argumentations to identify the strongest with regard to their legitimizing power and potential for intersubjective recognition (Forst 2017).

Ethically relevant arguments are all statements that refer to what ought to be done or what ought to be good, for example, "a distribution should be just" or "justice implies that equals are treated equally". Empirical findings can inform a value-related discussion, but do not in itself represent a value.[2] That one technology might release less CO_2 than another is a fact that needs to be linked to a valuation and argument: e.g. emitting less CO_2 is good as it preserves a liveable environment for future generations. Ethics in our understanding is in most cases concerned with discussing hierarchies and conflicts between values (Ammicht Quinn 2014: 28–32; Pieper 2007: 30–42). With regard to the pandemic, the question of whether societal security or individual security is to be prioritized and how security relates to freedom on different societal levels might be subject to ethical deliberation. What is understood as valuable, and if it is a value in itself or used to achieve a different end, is part of the ethical debate.

Against this backdrop, taking an ethics perspective is ambivalent. On the one hand, thinking about individual beliefs and reflecting on them in the face of individual experiences is a fundamental human trait (DeMarco and Fox 1986: 3). On the other hand, doing a structured and explicit ethical evaluation is a skill to be learned, which is linked to certain terminologies, methods and abilities to identify and discuss different moral positions on a specific subject. Ethics therefore is a scientific discipline with trained experts.

Ethics as a discipline combines several research fields and methodological approaches (Deigh 2012). Meta-Ethics is concerned with core principles and general ideas of ethics (e.g. "What defines a moral value?" or "What are common goods?"). Descriptive ethics is mainly concerned with describing different moral judgments and beliefs regarding a specific topic within a group/society (e.g. Person/group X believes that every human being has dignity). Normative or prescriptive ethics is about formulating moral beliefs on specific topics or general procedures to ensure morally right actions (e.g. Every human being has dignity. Therefore, all have a similar right to be protected from harm.). The most common normative ethical approaches are deontology (formulation of principles and duties which ensure the moral good of actions), consequentialism (formulation of desirable results and determining the moral good of actions accordingly), and virtue ethics (formulation of virtues that should be realized by our actions to make them good) (Winkler 2012: 175–176).

Finally, there is applied ethics or practical ethics. As there is no universal understanding of applied ethics (Beauchamp 2003), we followed the understanding of (security) ethics[3] presented by Ammicht Quinn in their 2014 book on security ethics.

[2] The argument refers to the argument of the naturalistic fallacy formulated by Hume (2009) and Moore (2000).

[3] A broad range of different fields of application exists besides security ethics. Examples are medical ethics, bioethics, media ethics, ethics of education, ethics of leadership, security ethics (Frey and Wellman 2003; Attfield 2012: 116).

Against this backdrop, we understand applied ethics as a different starting point of doing an ethical analysis rather than a fourth method (Ammicht Quinn 2014). While traditional normative ethics aims to formulate abstract and context-independent prescriptive principles, applied ethics is inspired by and grounded in the area of interest and examines specific situations where traditional normative ethics cannot easily name a clear way of action (Bayertz 2004: 55). Applied Ethics therefore complement traditional normative ethics. In our understanding, applied ethics is thereby neither detached from other levels of ethics, nor is it the mere application of normative principles to concrete cases (Ammicht Quinn 2014: 32–38). It rather combines all three research areas and methods (Beauchamp 2003; Dare 2012). As moral values are rooted in traditions, cultures, and experiences, they are (re-)produced in the actions that are taken within a society (May and Delston 2016). Especially within the context of security research, ethics therefore is also about scrutinizing existing societal structures and power relations and how the development of technologies (re-)produces them (Heesen 2014; van den Hoven, 2017). Or as Leese et al. (2019: 60) put it specifically for security ethics: "Ethics, however, is not limited to conceptual reflections about security and its status in society and politics, but can also serve as a practical angle for engaging the ways in which security is imagined and produced."

Consequently, every research and innovation project conveys an idea of what a good society might look like and how the research project contributes to this idea (Leese 2017). In other words, every technological development or formulation of social strategies promotes a more or less formulated answer to the question, "Which society/world do we want to live in?" (Ammicht Quinn 2014: 28). Technologies, for example, promote certain ideas of privacy, freedom, autonomy, justice, responsibility, and so forth due to the way they are designed or which actions they support. Making this explicit and the focus of reflection within research is what the European Group on Ethics in Sciences and New Technologies emphasizes in its aim for "responsible research and innovation" (2014; see also Leese 2017 and Leese et al. 2019). The integration of ethics therefore aims at making implicit questions explicit and start a critical reflection about the values that are inscribed in technologies and other innovations. This allows to identify potential issues or unwanted consequences already during the research process. While ethical scrutiny is often linked to and based on social and legal impact assessments, ethics is a distinct perspective that should be differentiated from other perspectives of integrated research (Büscher et al. 2014; Spindler 2017; Stubbe 2018; Viseu 2015).

We distinguish four types of ethical reflection for ethics assessments in research projects:

(1) formal ethical standards of good (empirical) research,
(2) ethical monitoring of the research process, which includes ethics consulting,
(3) discussion of application-related ethical questions regarding inscribed values and the desirability of the technology or social strategy to be developed
(4) discussion of fundamental ethical questions concerning the values at stake.

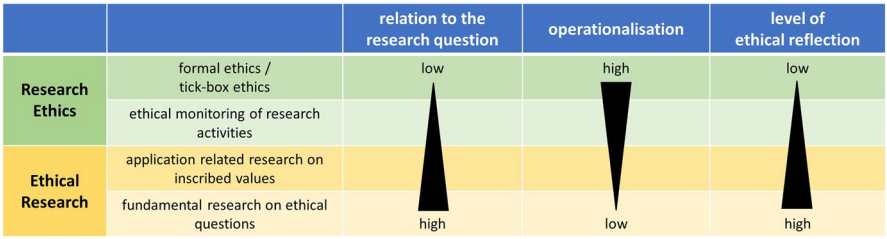
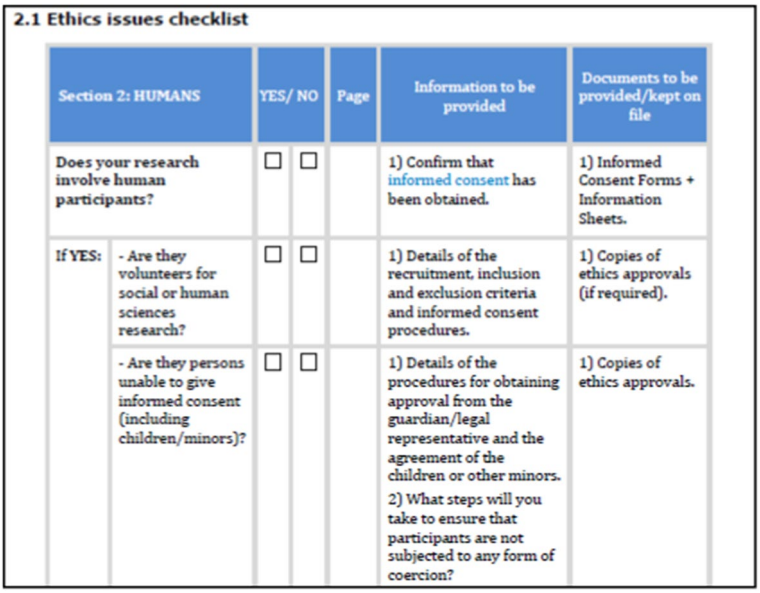


Fig. 1 Four types of integrating ethics in R&I projects

As Fig. 1 presents, these types are associated with different levels of relation to the research question, operationalization and ethical reflection. Formal ethical standards for instance are not directly linked to the research question but refer to general challenges such as the involvement of human participants. In line with this, there is a high level of operationalization that includes measures to be taken in order to address these challenges. Therefore, the level of ethical reflection is lower than in other types as specific tick boxes do already exist and only have to be checked. The discussion of application-related ethical questions has a much stronger link to the specific research question. Yet, it is more open with regard to the actual process of conducting the ethical assessment, which leads to a much higher level of ethical reflection. The four types can be categorized into two approaches: research ethics and ethical research.

3 The Integration of Ethics in the BuildERS Project

BuildERS ("Building European Communities' Resilience and Social Capital") is a project funded by the EU-Horizon Framework Programme under the topic of "Secure societies – Protecting freedom and security of Europe and its citizens" (EU-H2020, No 833496, 2019-2022). The project aimed at increasing the resilience of European states and citizens. BuildERS focused on improving ways to identify and support the most vulnerable members of European societies, as well as understanding the reasons why they lack capacities to deal with extreme events (see for instance Orru et al. 2021, Gabel et al. 2022, Schobert et al. 2023). Building on the idea that risk awareness, preparedness, and social capital play core roles in achieving this aim, the partners conducted several national case studies and one multinational European study that served as the basis for the development of technological solutions and social strategies. At the core of this approach was the reflection of existing conceptualizations of vulnerability as well as their implications for the ways vulnerability is measured, operationalized and used as the basis for disaster management efforts (Kuran et al. 2020).



2.1 Ethics issues checklist

Section 2: HUMANS		YES/ NO		Page	Information to be provided	Documents to be provided/kept on file
Does your research involve human participants?		☐	☐		1) Confirm that informed consent has been obtained.	1) Informed Consent Forms + Information Sheets.
If YES:	- Are they volunteers for social or human sciences research?	☐	☐		1) Details of the recruitment, inclusion and exclusion criteria and informed consent procedures.	1) Copies of ethics approvals (if required).
	- Are they persons unable to give informed consent (including children/minors)?	☐	☐		1) Details of the procedures for obtaining approval from the guardian/legal representative and the agreement of the children or other minors. 2) What steps will you take to ensure that participants are not subjected to any form of coercion?	1) Copies of ethics approvals.

Fig. 2 Excerpt from the ethics issues checklist of the EU-H2020 funding scheme

3.1 Integrating Ethics as Research Ethics

The evaluation of research proposals regarding their ethical clearance has become a key criterion for good research. Considering ethics to be an important perspective for research activities, discussing and addressing ethical concerns within the research design and activities is a first approach of integrating ethics into R&I projects. Thereby, we can distinguish two spatial dimensions that play a role in the following two categories: project-preparatory and project-accompanying research ethics.

3.1.1 Checkbox Ethics: Basic Standards of Ethics in Research

The perhaps most common way of considering ethics in research proposals is to seek approval from research ethics committees. This is to ensure standards of good research in empirical research and to take the interests and needs of those into account, who are affected by a particular research endeavour (Shuster 2014; Leese et al. 2019). The involvement of children or patients, the use of personal data and the investigation of potentially (re-)traumatizing themes are issues that in many cases call for particular attention (European Commission N/Aa). Because ethical standards are of utmost importance to guaranteeing dignity and the protection of individual rights, such considerations have been standardized into checklists that need to be addressed and filled in before or at the beginning of R&I projects (European Commission N/Ab; see Fig. 2). Highly formalized and based on core values and human

rights, this type of research ethics legitimizes research activities at a general level. These established standards are important. They are, however, basic and general and thus do not conclude research ethics as such (Spindler et al. 2020: 216, Leese et al. 2019: 69, Haggerty 2004). Moreover, it entails the temptation of reducing normative reflections, analysis, and discussions to these highly standardized tick boxes that mostly come as an obligation. In that sense, tick boxes do not reflect normative problems but only assure that core research values are not violated.

Filling out the ethics self-assessment was also the starting point for ethics in BuildERS. During the application phase, the different activities planned as part of the project were checked for the involvement of humans, especially those that are considered specifically vulnerable and could be harmed by the research. As the project focussed particularly vulnerable persons, measures to counter potential risks within the research activities, such as the provision of project information and informed consent sheets as well as procedures for collecting, storing, managing, using, and deleting data, were outlined and reflected.

Although necessary, this first steps encompassed some difficulties as especially in the application phase the specific design of planned research activities is developed in full detail. Therefore, it becomes even more difficult for those in charge of the ethics assessment to fully assess potential risks at this stage. Furthermore, if project partners do the assessment individually based on their different experiences and conceptions, similar research activities might be assessed differently. We consequently recommend a joined approach of ethics partner, project coordinator and all research partners.

3.1.2 Ethical Monitoring: Research-Accompanying Consideration of Ethical Challenges

An ethical monitoring during the whole project life cycle can be an important tool to enhance compliance with ethical standards laid out in ethics approval or tick box forms. Besides allowing an adjustment of research activities and raising the awareness for specific ethical concerns like data protection or the prevention of (unwanted and sometimes not easily foreseeable) discriminatory potentials, an ethical monitoring promotes a dialogue about ethical questions within an interdisciplinary research team. This is not only valuable for empirical research but can also spur theoretical reflection of so far neglected side effects early in the project. Such monitoring can help to identify important value-related topics that often concern the very aims of the research.

In BuildERS an ethical monitoring was included in a twofold form, consisting of a structured review of all research activities and an accompanying ethics consultation on ways to address potential issues and topics. We found it helpful to identify specific value dimensions against which the research activities are to be scrutinized to facilitate a substantial ethics monitoring. These dimensions are (up to a certain point) context-dependent and need to be adjusted to specific research projects and questions. Depending on the different ethical theories and aims, additional ethical dimensions might need to be established. For the ethical review in BuildERS, these value-related dimensions were derived based on the ethical self-assessment from

T X.X – NAME	
Involved Partners	
Month	
Description	
Ethical Topics and Issues	
Justice/ Participation	
Responsibility/ Accountability	(T.1): … … …
Freedom of Choice/ Autonomy	(I.1): … … … Mitigation Advise: …
Trust/ Transparency	
Non-Maleficence/ Beneficence	
Privacy/ Data Protection	

Fig. 3 Template for task assessment

the application phase, an intense screening of all project tasks, considerations about the project topic, a desk research on existing approaches (Manzeschke et al. 2013; Wright 2011; Wright and Friedewald 2013; Wright and Raab 2012) as well as experiences from previous research projects.[4] We derived six value-related dimensions from this analysis: (1) Justice and Participation, (2) Responsibility and Accountability, (3) Freedom of Choice and Autonomy, (4) Trust and Transparency, (5) Non-Maleficence and Beneficence, as well as (6) Privacy and Data Protection. These dimensions were outlined and described with regard to their meanings within ethical discourses and transferred to the research interest. For the dimension of "Justice and Participation", for instance, different concepts of justice and related aspects such as recognition, distribution, and capabilities, were presented and linked to specific questions of the project. These categories were used as a structure to examine the project activities or tasks (Fig. 3).

In this process, we found it helpful to distinguish between "issues" (I) and "topics" (T). While the issues referred to challenges that were to be addressed to ensure ethically acceptable research, the category "topics" detailed value-related points in the project research that might be discussed in order to improve the project outcome. In the analysis, a topic thus indicates a question that would be worthwhile to discuss from an ethical standpoint. An issue, in contrast, referred to a potential problem which had to be tackled. If a potential ethical issue was identified, mitigation advice was given and an ethical consulting offered. The implementation of these advices was regularly reviewed and adjusted if necessary. For instance, practitioners advised us that homeless people or clients of soup kitchens, who should be part of the BuildERS interview study, disproportionally often mistrust authorities for various reasons. Therefore, and due to the ongoing COVID-19 restrictions that prevented researchers from the consortium to enter the facilities, the staff of the social facilities was to be included as interviewers to facilitate field access. This raised a number of ethical concerns about power relations and dependencies. In line with outlining this potential issue, we advised to include ethics training for interviewers which should

[4] (see for instance VERSS: Aspekte einer gerechten Verteilung von Sicherheit in der Stadt [BMBF, 12N1203], KOPHIS: Kontexte von Pflege- und Hilfebedürftigen stärken [BMBF, 13N13869], SECTOR: Secure European Common Information Space for the Interoperability of First Responders and Police Authorities [FP-7, No. 607821], HEIMDALL: Multi-Hazard Cooperative Management Tool for Data Exchange, Response Planning and Scenario Building [H2020, No. 740689]).

increase the awareness of potential sensitive issues and recommendations on how to deal with them. In another task we pointed to the topic and question of why persons might not participate in our research in order to stimulate a discussion on potential ways to deal with this in the project. This is not per se an ethical problem, but might well be a value-driven topic in the research consortium. The distinction between issues and topics is not always straightforward but should follow the precautionary principle in order to perform good research.

Limitations and challenges of the ethics monitoring in BuildERS evolved for instance around the perception of the monitoring reports. Although the partners cooperated in the development process the consideration of these reports throughout the project are to a large degree dependent on the interest of the project coordination. Furthermore, pointing towards potential issues and topics might also be perceived as problem creating criticism rather than adding value (see also Leese et al. 2019: 67), an ongoing exchange with all partners is required. Finally, we encompassed difficulties in staying informed about ongoing activities and process, considering the number of 17 project partners. We approached these difficulties with a fixed slot on ethics in almost every meeting and by offering ethics consultation to the partners.

3.2 Integrating Ethics as Ethical Research

The ambivalence between promised benefits and anticipated risks associated with new technologies is the driver for societal discussions on the desirability and potential implications of technology and technology development processes (Zwart et al. 2014). Such an analysis of values, norms and principles on the one hand, and potential (unintended) consequences, on the other hand, calls for a (project) content-related ethics research. This includes the reflection on the acceptance and acceptability of technologies and practices that are at the heart of the research project.

Acceptance, herein, refers to the empirical question of if stakeholders would be willing to use or at least to tolerate the establishment of a new practice or technology. As this not only influenced by technical feats such as usability but also by the degree to which users perceive a technology in line with their own beliefs (e.g. with regard to data protection), scrutinizing acceptance is also linked to acceptability. Acceptability is about the normative question of "What standards a technology has to meet to be ethically acceptable?" This question is a reflexive one, as it refers to normative standards and finally to moral beliefs, whether the establishment of a technology o practice is desirable.

Against this backdrop, in addition to being responsible for (internal) standards of good research, researchers also have an (external) social responsibility for research towards individuals and societies (Ernst 1987; Jonas 1989). Meeting this second responsibility encompasses two different kinds of questions, which refer to two strongly intertwined forms of ethical research: application-related ethical questions and fundamental ethical questions.

3.2.1 Application-Related Ethical Questions: Working on Moral Uncertainty and Ambiguity

Besides the two ways of implementing research ethics, an ethical perspective can (and should) be taken on the technology and innovation itself. The effects of new technologies and practices on individuals, societal groups and whole societies are often uncertain. Equally uncertain are the social strategies to mitigate potential negative effects for the affected stakeholders. To deal with both challenges productively and appropriately, an ethical analysis of the values and arguments at stake should take place. Building on methods from technology assessment and ethical decision-making, three steps usually take place (Ranisch et al. 2016):

(a) a description of the situation/technology/context and the identification of existing and potential ethical issues, questions, and arguments associated with it,
(b) an analysis and evaluation of existing arguments and expressed moral judgments regarding their consistency and legitimizing power on a societal level,
(c) a formulation of ethical points to consider, which outline questions to be discussed, arguments that should be scrutinized, as well as recommendations on how to proceed to accomplish an ethically informed development.

This ethical approach follows the claim of normative rationality. It argues that decisions on how to act with regard to values at stake are informed by ethical reflection on premises and beliefs (Ammicht Quinn 2015: 120). The resulting points to consider can be presented in "if–then" arguments that refer to potential actions that could be taken and outline implications they likely entail (Grunwald 2002). Such an ethical analysis follows Pielke's idea of an "honest broker" who presents topics, options, and evaluations to provide guidance for decision-makers (Grunwald et al. 2021; Petersen et al. 2015; Pielke 2010). In other words, both, technology assessment and discussing societal recommendations on how to act in a certain situation require informed discussions and a conscious and transparent handling of value-related decisions within technology and strategy development.

In the BuildERS project, such ethical research took place in two ways. First, we scrutinized the conceptualization of vulnerability. Second, we developed a questionnaire, which should help the project partners to reflect their work. The BuildERS project aimed to improve the resilience of European citizens by reducing the risk of some people becoming vulnerable, who are often overlooked by disaster management efforts. Based on the assumption that understandings of vulnerability pre-structure whom the research would recognize as "affected person," and which factors should be considered for implementation, the conceptualization of vulnerability was a core aspect of the project. Therefore, a discussion on the implications of different conceptualizations of vulnerability took place in the early project phase. Within this process we discussed criteria for an ethically appropriate way of conceptualizing and operationalizing vulnerability. As a starting point, the two main conceptions, vulnerability as a static concept and vulnerability as a dynamic concept, were described alongside four questions: To what threat is vulnerability linked?

Who is considered vulnerable? Why is an entity considered vulnerable? How is the level of vulnerability being assessed or measured?

These findings were scrutinized from the three value dimensions justice, responsibility, and privacy. Justice was understood as the starting point of the project, as vulnerability is spread quite differently among European citizens, leaving some persons or groups at a much higher risk of being hurt or dying in the event of a disaster. A closer look at justice-related questions should outline how the use of certain approaches influences the kinds and number of vulnerabilities that become visible and addressable by disaster management efforts (Gabel 2019). Responsibility was considered important as the way vulnerability is defined refers to different starting points for reducing vulnerability (Krüger and Gabel 2021). If the reasons for becoming vulnerable are connected to individual characteristics and not connected to structural disadvantages, different actions and outcomes are predetermined. Finally, privacy was considered important, since different conceptualizations of vulnerability require different data. This refers to the dilemma that a lack of data might not allow for an appropriate description of relevant situations, while data collection might pose risks for those who might benefit the most (e.g. undocumented refugees). Although these three dimensions are contingent, they proved crucial as they were closely connected to certain aspects of the BuildERS research and the question "What would be an ethically appropriate way of conceptualizing and operationalizing vulnerability?". Taking these three dimensions together, the ethical analysis showed diverse ways in which definitions of vulnerability are linked to questions and issues of discrimination, normalization, autonomy, acknowledgment, and participation. Based on this analysis, points to consider and if–then arguments regarding an ethically appropriate way of conceptualizing and operationalizing vulnerability were formulated. These served as the basis for an internal project discussion, which led to the decision to use an intersectional approach to vulnerability (Kuran et al. 2020).

Moreover, the formulation of recommendations for improving European disaster management as well as proposing technological innovations was part of the BuildERS project. Here, our work focused on the anticipation of potential negative side effects, guided by the question of "How do we reduce the risk of increasing vulnerabilities or creating negative side effects for those who should profit from the project?". This analysis aimed to improve the acceptability of the BuildERS results. The starting point for working on this question were the six dimensions chosen for the monitoring process, which were used to formulate a questionnaire to help identify the limitations and implications of the BuildERS recommendations (Fig. 4). The questions were not used as a checklist, but as a questionnaire to raise reflective questions on specific innovations or recommendations to guide a structured discussion within the consortium. Therefore, not all questions had to be discussed for every innovation or recommendation.

The main challenge we encountered using this process evolved around monitoring the use of these questions due to the size and the diversity of the project consortiums. The restrictions linked to the pandemic exacerbated this problem. Thereby, the project partners expressed difficulties in adjusting and widening the questionnaire to suit their specific results.

Justice and Participation	
Who was not included in the co-creation process and on what reasons?	e.g. Did the co-creation process only include representatives of XYZ from one specific national context?
Who could be excluded by the co-creation process?	e.g. Why are individuals or groups not included in the co-creation process?
How is it ensured that every relevant stakeholder is able to participate or represented?	e.g. Does the co-creation process make sure that it is accessible for all relevant stakeholders and who defines who is relevant?
Responsibility and Accountability	
Through which measures are people informed about the co-creation process?	e.g. Does the co-creation process include measures about ensuring that affected people or their representatives can participate?
Freedom of Choice and Autonomy	
How does the co-creation process ensure a certain freedom from external (including structural, systemic, peer) pressures?	e.g. Does the co-creation process take into account that structural pressures might hinder people from acting in their own interest?
Trustworthiness and Transparency	
How are rules of processes and power hierarchies made transparent?	e.g. How does the co-creation process consider that strategies and actions are made transparent and open for criticism?
How does the co-creation process support that mistakes or shortcomings are made transparent?	e.g. How does the co-creation process support self-reflection of the taken actions and a public involvement in the adjustment? If it doesn't: why?
How does the co-creation process support the development of trustworthy actions?	e.g. Are there any supervision strategies or corrective mechanisms included in the processes and actions that stem from the co-creation process?
Privacy and Data Protection	
How is personal data protected?	e.g. Which standards and limitations are provided for data use?
Beneficence and Non-Maleficence	
Does the co-creation process ensure that it benefits the situation of the most vulnerable?	e.g. Under which conditions might the co-creation process not lead to an improvement to existing measures/procedures/strategies?

Fig. 4 Ethics guideline for deriving policy recommendations

3.2.2 Fundamental Ethics: Research on the Values at Stake Itself

Finally, we consider a fourth type of performing ethics of potential importance: fundamental ethical research. It deals with questions such as "Should social diversity or security be considered ethical values?" Such questions are strongly intertwined with application-related ethical research. While the former very much refers to the reflection on specific actions, the latter refers more to the disciplinary side of ethics. As such, it builds on a certain cultural, theoretical, and methodological background that frames, enables, and initiates its research perspective. To know this basis is not only a core resource to understand, structure, and analyse value dimensions and arguments. It can also help to reveal problematic premises and scrutinize them.

This level of research on ethical questions was not specifically involved in the BuildERS project, since its approach started from the conviction that disaster risk reduction, or more specifically, the reduction of vulnerability, is an aim and topic that relates not only to the "broad" society but especially to those in the most vulnerable situations. Nevertheless, it might be of importance in other research projects, especially in the context of security ethics. One key goal here is to scrutinize the importance of the value security in relation to other values, such

as freedom or privacy (Ammicht Quinn 2014; Leese et al. 2019; Mahoney et al. 2022). This raises a variety of fundamental ethical questions, which may also be included in R&I projects. At the same time, existing funding structures might complicate such fundamental ethics research, as these ethical scrutiny potentially questions the premises of the funding schemes.

4 Structural Aspects of Integrating Ethics in R&I Projects

Apart from the methodological considerations of how ethics is integrated into R&I projects, the actual way(s) and structural aspects in which this occurs is also determined by the project setup.

The first aspect of the project setup that influences the integration of ethics is the project time and duration. This refers to questions such as "Is an ethical perspective already included in defining the project idea and research question?" or "Is an ethical perspective integrated only at a certain point in time, for instance, at the initial ethical approval, or over the whole project life cycle?" (see, for instance, Mahoney et al. 2022). Considered from a more general point of view, the question of timing represents one of the fundamental dilemmas of ELSI research, most prominently established in the Collingridge dilemma (Collingridge 1982; Spindler et al. 2020: 229–230). According to this description, ethical research finds itself in a state of tension between conducting research before a technology is developed and after it is developed. In the first case, the potential ethical influence on the process is quite large, but it lacks proper knowledge of the technology and its capacities or limitations. In the second case, this information is available, but the possibility to actively influence the development process has passed (Viseu 2015). This dilemma is strongly entangled with current funding schemes, which, in the best case, understand ethical and technical research as simultaneous tasks.

The second aspect concerns the position of ethics within a specific project (Viseu 2015; Mahoney et al. 2022). Is an ethical perspective integrated in the form of an ethics committee, which approves the research activities, is it a subcontract in the form of a one-time expertise, or a full project partner? Strongly linked to the position is the expected role of ethics. Ethics can both be underestimated (as a simple add-on) or overestimated (as an expert in all ELSI disciplines) (Büscher et al. 2014; Spindler 2017; Stubbe 2018).

The third aspect concerns ethics as an academic discipline and those who are responsible for integrating and performing ethics. It has already been mentioned that ethics can be perceived as ambivalent in this regard. Most people reflect on their own organizational or moral beliefs—up to a certain point. Furthermore, it would be wrong to argue that ethics itself is something new to engineering science or technology development (Gehring 2013; Spindler et al. 2020). Yet, ethics is an academic discipline with a theoretical and methodological tradition, a language for certain phenomena and a tool kit for linking theories and practices. Ethicists have learnt to make use of this. Devaluating ethics as an academic discipline would ignore the

fact that it takes training to analyse controversial arguments from an ethical point of view.

However, an ethical analysis in research projects on R&I does not necessarily need to be performed by ethicists. Many social scientists have a sound scientific background that can be used for ethical research and for identifying and scrutinizing moral arguments. If performed by non-ethicists, additional training or knowledge is advised in order to prevent that an alleged ethics perspective is actually only the fig leave for another ELSI perspectives. Not quite surprising, the best option might be to contribute an ELSI perspective by teams of trained ethicists, legal experts and social scientists; this might also allow for a balance between natural sciences, engineering sciences, social sciences, and humanities (see also Viseu 2015).

Finally, a fourth aspect concerns the way in which ethics is included into the project structure. Leese et al. (2019: 66) distinguish two options in this regard: (a) ethics as a singular working package (WP) or (b) ethics as a working tasks which is involved into every WP separately. While (a) represents a standing of ethics as equally important to other tasks, it requires efforts of all partners to take part in ethical reflection; otherwise, the ethical research risks to lose important links to other ongoing research activities. Option (b), in contrast, benefits from strong ties between the different research activities (of other partners) but might lack a more general perspective on the project as such. Both approaches face the challenge that ethics research might be equated to ELSI, which might raise inappropriate expectations (Leese et al. 2019: 66–69).

We found BuildERS in a fortunate situation with regard to the first three dimensions. An ethics institute with many years of experience in applied ethics and third-party funded research was involved as a full partner during the whole project life cycle with a team of both trained ethicists and social scientists. Furthermore, the consortium was genuinely interested in discussing ethical issues and integrating ethics expertise into their specific disciplinary tasks. Against this backdrop, many of the presented issues did not occur and the ethical perspective was generally deemed important. To some extent, this might also be due to the project's idea and research question, which focused on the development of strategies and their technological support rather than on the development of technologies. Furthermore, this might be due to the way ethics were included in the project structure. In line with the difficulties Leese et al. (2019) outlined, we decided to combine both approaches and included ethics as a single WP as well as a task in every project WP. This design allowed for an involvement in many tasks performed by the other partners for performing the ethics monitoring, while simultaneously granting enough resources for a deeper ethical reflection on the topic of the project. At the same, this design always raised questions on the demarcation and the limits of the ethical perspective.

5 Conclusion

Ethics is a growing demand on the research agenda, particularly in the field of security research. This article pursued the aim of sketching out one example of what an ethics research design might look like in an international, transdisciplinary research consortium. The article cannot and does not want to provide a one-size-fits all solution but rather represent one potential understanding of ethics and a methodological approach, which might help ethicists or those responsible for performing ethics related research in R&I projects to develop an appropriate research design for their particular project.

Notwithstanding the multiplicity of ethics approaches and the diversity of research projects, we find the four-partite approach of research ethics and ethics research useful to structure ethics research in complex research environments. This structure helps to conduct genuine ethics research, which is important and legitimate to spur debates and developments in the academic discipline of ethics itself. Yet, it is likewise legitimate to consider ethics as a service, for a research project and finally for society. Both dimensions are in dialogue, since the toolbox of the academic discipline determines the means for conducting ethics in research projects and ethical research in projects provides cases and empirical material to further develop the academic discipline.

Ethics is thereby should not be understood as an external category imposed to "control" research results with regard to their normative desirability, but as one perspective to increase the quality of the overall research results. The growing demand for ethics research speaks of the increasing prominence of this perspective. This is a great chance to furtherly develop the tools we use to pursue this task. The aim of this article was to contribute to this journey by sharing experiences and methods.

Funding Open Access funding enabled and organized by Projekt DEAL. The article presents research carried out in the course of the BuildERS project (EU-H2020, EU-H2020, No 833496). Furthermore, the approach builds on research from several German (VERSS [BMBF, 12N1203], KOPHIS [BMBF, 13N13869]) and European Research projects (SECTOR [FP-7, No. 607821], HEIMDALL [H2020, No. 740689]). We thank the reviewers for their encouraging and utterly helpful comments and critique throughout the review process.

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