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## The Case of Digital Ethics in IS Research – A Literature Review

Christopher Julian Kern

*EBS Universität für Wirtschaft und Recht*, christopher.julian.kern@gmail.com

Markus Noeltner

*European Business School*, markus\_noeltner@web.de

Julia Sarah Kroenung

*European Business School*, julia.kroenung@ebs.edu

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# **The Case of Digital Ethics in IS Research – A Literature Review**

*Completed Research Paper*

**Christopher Julian Kern**  
University of Hagen  
58097 Hagen, Germany  
christopher.kern@fernuni-hagen.de

**Markus Noeltner**  
University of Hagen  
58097 Hagen, Germany  
markus.noeltner@fernuni-hagen.de

**Julia Kroenung**  
University of Hagen  
58097 Hagen, Germany  
julia.kroenung@fernuni-hagen.de

## **Abstract**

*Due to the rapid development in technology and the increasing digitization of organizations and society as a whole, digital ethics is becoming an increasingly important topic for researchers and practitioners of information systems (IS). This literature review shows the state of the art of ethical views present in IS research, at first establishing the relevance of the topic and then showing recent developments. Using a holistic view on ethics, this article provides (1) an overview of the number of publications considering ethics in IS research and on the different ethical constructs and theories. Additionally, it provides an overview (2) on the different fields of application. The aforementioned concepts (3) are contrasted to identify research streams and derive research gaps. Additionally (4), we provide a categorization scheme to classify ethics research in IS into 4 different types and from there (5) derive research propositions for future projects.*

**Keywords:** Digital Ethics, Ethics, IS Research, Research Domain

## **Introduction**

Digital transformation in companies, government agencies, and our society as a whole has led to many challenges on both a technological as well as a social level. The design and employment of technology includes several ethical challenges, for example, which data to collect, how long to store them, and under which conditions access should be granted (Spiekermann 2015). Digital ethics try to find possible answers to these and other questions concerning the use of digital technology. The case of digital ethics has been taken up by a multitude of actors. In the recent past, governmental task forces have been created to seek answers for ethical questions in different areas of application, such as the German ‘Initiative D21’ (Horn and Müller 2017) in 2017, or the French Comité national pilote d’éthique du numérique in 2019 (CCNE 2020). Consulting firms such as Gartner (den Hamer 2020) or PwC (2020) have conducted various studies and published reports on the subject in recent years. Scholars have committed themselves to the topic of digital ethics. Mahieu et al. (2018) have shown that digital ethics is an interdisciplinary field, with research being conducted in several overlapping branches, such as computer science, health and life sciences, and law. Recognizing the increasing interest in the topic, it is especially important for information systems (IS)

research to take up these issues and to deal with the ethical use of information technology (IT) systems. Similarly, Siau and Wang (2020) did so for the applied ethics discipline of artificial intelligence (AI) ethics.

Spiekermann (2021) has provided a virtue- and value-based approach on how digital ethics can shape the landscape of information and communication technology (ICT). Many researchers use ethics and apply them to different fields of IS research. Robbins and Wallace (2007), for example, have provided an overview of different ethical theories and applied their respective aspects to agents for decision support systems.

However, despite these valuable insights into ethical theories, there is no systematic literature review which addresses the ethical theories used and their areas of application in IS. This is especially interesting, since there is a large amount of ethics to draw from and an equally large number of problem cases to apply them to. Likewise, it is important to get an overview about what is considered an ethical problem in a field of application, or which ethical viewpoints and stances are taken by practitioners of IS.

Therefore, it is our goal to provide a comprehensive overview of the different forms of ethics and their fields of application in IS in the course of digital ethics. To the best of our knowledge, in the field of IS research, such a literature review is currently lacking.

RQ1: Which kind of ethical views can be found in IS research?

RQ2: Which IS contexts are these ethical views used in?

RQ3: Where are the main contributions in IS research, are there significant gaps?

For this purpose, we have examined the most relevant IS journals. Given the broad nature of digital ethics and the implication that the term ‘digital ethics’ could apply to either of the many constructs and concepts employed, we decided to review all ethics-related literature in the mainstream IS journals. With this article, we aim to give a state-of-the-art overview of research in digital ethics in the field of IS. We show both ethical views and the areas these are applied to, identifying the different branches and providing a categorization for research done on the subject. This enables us to assess the state of IS in the debate on the ethically correct design and use of IT systems. On this basis, we provide further guidance by highlighting both areas of interest for future investigation and unanswered questions, deriving research propositions for future projects.

## **Conceptual Background**

### ***Ethics***

The term ethics denotes the “philosophical science that deals with the rightness and wrongness of human actions” (O’Neil 2004, p. 474). Ethical theories consider the comprehensive investigation of ethical problems, concepts, principles, reasoning, and judgments, their interconnections and justification (Becker and Becker 2001). Düwell et al. (2011) have provided a categorization for normative ethical theories, differentiating them into ‘teleological’, ‘deontological’, and ‘weakly normative and contextualist’ approaches. Teleological ethics describe those theoretical approaches that focus their attention on specific purposes or goals, for example virtue ethics (Aristotele et al. 2009). Deontological ethics are those whose evaluation of the action does not result from the consequence, but from the intrinsic value of the action, such as Kantian ethics (Kant 1998) or discourse ethics (Habermas 1987). A third category was proposed by Düwell et al. (2011), namely the category of ‘weak normative and contextualist approaches’, including ethical models that can neither be assigned to the teleological or deontological family nor fall into the realm of applied ethics. Beyond these categories are the meta-ethics, which concern the conceptual foundations to address the phenomenon of morality scientifically (Düwell et al. 2011).

‘Applied ethics’ take aspects of ethical theories in consideration, mapping them to a domain of application, although it is also possible to view a field of application with the lens of an ethical theory (Winkler 2012). In contrast to ethical theories, applied ethics apply ethical considerations, principles, values etc. to different policies and practices with the aim of evaluating these in an ethical fashion (Becker and Becker 2001). Examples of this can be found in numerous publications, such as Vieweg (2021) providing guidance on the impact of AI on society and the questions that arise therefrom. Computer ethics as a more detailed example analyze the “nature and social impact of computer technology and the corresponding formulation and justification of policies for the ethical use of such technology” (Moor 1985, p. 266).

## **Digital Ethics**

Digital ethics is concerned with the design and use of digital technologies for society as a whole. It is based on the foundations of computer and information ethics (Floridi et al. 2019). Floridi et al. (2019) base their definition of digital ethics upon a definition of data ethics. Therefore, digital ethics can be understood as “the branch of ethics that studies and evaluates moral problems related to data [...], algorithms [...], and corresponding practices [...], in order to formulate and support morally good solutions [...]” (Floridi and Taddeo 2016, p. 3). Digital ethics can be considered applied ethics, as it draws upon numerous academic branches as well as practitioners’ advice, and tries to create ethical analyses that can be translated into guidelines for scholars and practitioners alike (Öhman and Watson 2019).

As stated before, different views on digital ethics can be taken. For example, Spiekermann et al. (2022) build their foundation on ethical virtues and values, whilst Schlagwein et al. (2019) use discourse ethics as their basis for analysis. Whichever ethical view is used, for the field of application, it is important to first clarify which aspects of digitization are triggering ethical issues. With this knowledge, one can better understand social processes, providing a starting point to further investigate the ethical impact of these developments (Horn and Müller 2017). The conception, design, and development process of digital technologies are crucial to digital ethics. As these technologies become more widespread and used, they change the social dynamics of how people interact with each other. Because of this reason, it is important to guide the development of digital technologies in a direction considered ‘good’ by the general society. Digital ethics therefore provide a holistic approach to all ethical and moral issues that are caused by digital innovation (Floridi et al. 2019). Considering the numerous different manifestations that ethical theories and applied ethics can take, it is not surprising that a multitude of ethical views can be applied to the same field of application. The review of the literature allows us to identify different approaches to the ethical problems in IS.

## **Methodology**

To gather the sample for our literature analysis, we performed a literature review following Webster and Watson (2002). We based our search on the 21 top-tier IS journals proposed by Lowry et al. (2013). Lowry et al. used cluster analyses to divide their sample of 21 top-tier IS journals into different tiers to assess their impact. To find the literature, we used the following search terms ([“Digital Ethics”] OR [“Digital” AND “Ethics”] OR [“Ethic”]). We decided to search each journal individually, not relying on the preselection of Databases. We also did not restrict the timeframe of the search. This resulted in a total of 3,471 publications, after the elimination of duplicates and irrelevant articles, such as ‘keywords’, ‘about the authors’, editorials etc., there remained 2,041 articles. We analyzed each of the articles’ keywords and abstract in terms of the analysis of a respective field of application using ethical viewpoints. We then considered 750 articles for further investigation, reading them closely and analyzing whether they included significant ethical analyses or not. We kept articles if they considered ethics or ethical issues elaborately, giving insight into how and why ethics are related to the technology or problem under investigation. Articles that only briefly mentioned ethics in passing, without elaborating why or how a certain ethical model or method is applied to the respective field of IS, were excluded from the sample. Upon detailed reading, additional articles were eliminated if they did not elaborate how ethics would be applied to the problem case in adequate detail. The resulting final sample consists of 527 articles. A complete list of all papers is available from the authors upon request.

Table 1 summarizes the results of the literature review by journal, grouped into tiers according to (Lowry et al. 2013). While analyzing the sample, we considered whether a definition for ‘ethics’ was given and if it came from the realm of ethical theories or applied ethics. We also reviewed if ethics was the primary focus of research and if ‘ethical issues’ have been considered. Aside from that, we identified ethical and IS concepts.

	Journal	Results*	Closer inspection	Final sample
Top IS Journals Tier 1 (Lowry et al. 2013)	MISQ – Management Information Systems Quarterly	201	96	56
	ISR – Information Systems Research	87	30	24
	JMIS – Journal of Management Information Systems	123	41	31
Top IS Journals Tier 2 (Lowry et al. 2013)	DSS – Decision Support Systems	136	31	21
	EJIS – European Journal of IS	154	70	50
	I&M – Information & Management	185	48	25
	IJEC – International Journal of Electronic Commerce	74	28	15
	ISJ – Information Systems Journal	164	79	45
	JAIS – Journal of the Association for Information Systems	118	37	32
	JIT – Journal of Information Technology	129	43	30
	JSIS – Journal of Strategic Information Systems	31	17	14
Relevant IS Journals (Lowry et al. 2013)	BISE – Business & Information Systems Engineering	22	13	12
	ECRA – Electronic Commerce Research and Applications	29	16	14
	ISF – Information System Frontiers	132	70	56
	ISM – Information Systems Management	72	25	23
	IT&M – Information Technology & Management	15	8	7
	JCIS – Journal of Computer Information Systems**	190	51	42
	JDM – Journal of Database Management	29	6	3
	JGIM – Journal of Global Information Management	77	17	9
	JOCEC – Journal of Organizational Computing and Electronic Commerce	43	11	8
MISQE – Management Information Systems Quarterly Executive	30	13	10	
Sum		2041	750	527

**Table 1. Results of the Literature Collection**

\*Note: We display the number of results, after reading keywords and abstracts, with the elimination of duplicates and irrelevant articles.

\*\*Note: For JCIS we had access to 25 out of the 51 articles considered as relevant for a closer inspection.

## Findings

Within our sample of 527 articles the publication dates ranged from 1977 to 2022. We observed a trend towards an increase in ethics-related publications. In the early 2000's we found a relatively stable trend, which increased in the 2010's. In actual numbers, we have for instance 6 articles in our sample in 2000, 23 in 2010 and 57 in 2020. Accordingly, we can conclude, that ethics research has gained importance and is receiving more and more attention in the field of IS.

In our sample, we found the term 'meta-ethics' five times (Chatterjee and Sarker 2013; Kim et al. 2018; Mingers and Walsham 2010; Stahl et al. 2014; Wakunuma and Stahl 2014). Meta-ethics give insight into the theoretical background of ethics. As our research focused on the application of ethical concepts to IS issues, background was not a focus of our research and, we decided not to delve further into meta-ethics.

In the following subsection, we give an overview of the ethical and IS concepts we encountered when reviewing our literature. In the subsequent subsection, we explain the different fields of application in IS. We grouped the ethical concepts of our sample into four categories: *ethical theories*, *applied ethics*, *ethical issues*, and *general ethics*. Each of them is described in the subsection: *Ethics*.

## Ethics

Under *ethical theories*, we subsumed theories as described in the theoretical background. To the area of applied ethics, we decided to include *codes of ethics* and the concept of Effective Technical & Human Implementation of Computer-based Systems (ETHICS). Even though they are not applied ethics per se, they are the implementation of the ethical considerations of a certain branch, exempli gratia business ethics. In addition, *ethical issues* deal with the identification of ethical issues and *general ethics* includes all remaining considerations in quantitative or qualitative nature regarding ethics. The detailed definitions of the concepts we found can be seen in Table 2.

We were able to identify several ethical concepts used in IS, starting with *ethical theories*. For *discourse ethics*, Yetim (2006) employs this ethical theory in terms of organizational communication to address meta-communication processes. Schlagwein et al. (2019) applies discourse ethics to crowdsourcing practices, analyzing the organizational fairness for crowdsourcing workers. Mingers and Walsham (2010) use the concept to explain and discuss different technological examples such as open-source software or the digital divide, and to assess the value of their ethical issues for IS research. *Duty ethics* are, for example, employed by Rowe (2018) to discuss the philosophical basis for IS research. *Utilitarianism* is one of the concepts used by Siponen and Vartiainen (2004) to review the different stages of moral development in the context of unauthorized software copying. As for *value ethics* in the context of IS, Dadgar and Joshi (2018) investigated the values of patients in the design of ICT systems that should aid them. Similarly, Nicolescu et al. (2019) examined the values regarding devices in the internet of things. *Virtue ethics* were used in an organizational perspective to identify that an organization's ability to improvise is strongly influenced by the ethical nature of the organization, which in turn is brought about by the opportunities that IT provides (Chatterjee et al. 2015). From an organizational change perspective, the concept of virtue ethics was used to further explore innovation and organizational change (Chatterjee et al. 2020). In terms of *non-Western ethics*, *Confucian ethics* have received a great deal of attention - in IS, Davison et al. (2009) examined the ethics of IT professionals in Japan and China, stating a Confucian emphasis on personal relationship with particularistic obligations. Similarly, Chu et al. (2019) examine Confucian ethics and their impact on business practices. Naturally, a possible approach would be to draw upon ethical theories from multiple disciplines, for example teleological and deontological ethics. Sojer et al. (2015) did so in developing a framework to explain unethical programming behavior, such as the reuse of software code or a lack of testing.

For *applied ethics*, we were also able to identify numerous concepts, starting with *AI ethics* for which Jöhnk et al. (2021) examined the readiness of organizations to adopt AI, also considering the ethical implications. Algorithmic ethics show similar traits to AI ethics. A strong focus is put on the specific design of single algorithms, as they are not without ethical impact (Tsamados et al. 2021). We decided to group algorithmic ethics as a subset of AI ethics. The main area that has been researched in IS literature is the impact of automated algorithmic decision-making and possible biases in the application of this technology (Galliers et al. 2017; Marabelli et al. 2021). *Business ethics* – in context of IS research – have been employed to deal with ethical quandaries, specifically in the corporate domain (Smith and Hasnas 1999). Organizational privacy poses another field of application – here *business ethics* can be used to argue about ethical dilemmas, such as the use and misuse of information. *Computer ethics* are used to evaluate the moral reasoning of software piracy (Siponen and Vartiainen 2004). Another application is the impact of information technology on ethical intentions based upon ethical dilemma situations (Leonard and Cronan 2001).

For *IS ethics*, McBride (2014) expanded upon Mason (1986) to create a framework that concerns itself with the cases of IS – McBride considered the change of environment. On the time of publication, computing has become more de-centralized and detached from sole organizations, demanding a greater responsibility from individuals. *Research ethics* are concerned with the morally responsible conduction of research, abiding by a multitude of different principles. Depending on the stream of research and the region, there are numerous examples. Israel and Hay (2006) refer to the Belmont Report (USA 1978) with the three major guidelines respect for persons, beneficence, and justice. In this section, we also included *codes of ethics*. In IS research, codes of ethics do exist for practitioners (Harrington 1996; Smith et al. 2001) – for example the “ACM Code of Ethics and Professional Conduct” (ACM 2018) – as well as for researchers (Kock and Davison 2003).

Concept	Definition
<b>Ethical theories</b>	
Discourse ethics	Discourse ethics is based on Habermas's theory of communicative action. It describes the concept that social order depends on the ability of actors to recognize the intersubjective validity of the various demands of social cooperation (Bohman and Rehg 2017).
Duty ethics	According to duty ethics, every actor has to take themselves into account, as well as the one who is necessarily affected by their actions. This includes both positive and negative duties (Düwell et al. 2011).
Utilitarianism	Utilitarianism tries to achieve the greatest happiness principle for all people, minimizing pain and maximizing pleasure (Becker and Becker 2001).
Value ethics	Generally, ethical values are connoted with something 'good' or 'worth achieving'. Max Scheler proposed an ethical theory based upon values themselves, ranking them and stating that a person will be intrinsically drawn to higher values (Becker and Becker 2001).
Virtue ethics	Virtue ethics go back to Aristotle and put emphasis on the virtues or the moral character of an individuum in contrast to other approaches that put emphasis on the action or said action's result (Aristotele et al. 2009).
Non-Western ethics	Within the sample, we found different non-western examples of ethics, such as Islamist ethics (Zainul et al. 2004), however the majority of publications have focused on Confucian ethics. The modern stream of Confucian ethics focusses on applying Confucian teachings to business cases and management decisions. Here, six key virtues and the goals of self-improvement and self-regulation are important aspects (Woods and Lamond 2011).
Multiple disciplines	Naturally, a possible approach would be to draw upon ethical theories from multiple disciplines, for example teleological and deontological ethics.*
<b>Applied ethics</b>	
AI ethics	AI ethics are concerned with the design and development of artificial intelligence in a 'positive' way (Floridi and Cowls 2019).
Business ethics	Business ethics are concerned with everyone that 'does business' and seeks to study the ethical dimensions of the exchange of goods and services (Moriarty 2021).
Computer ethics	Computer ethics are concerned with the protection and advancement of major human values such as life, health, security, and freedom in the environment of information technology (Floridi 2010).
IS ethics	For IS ethics, McBride (2014) expanded upon Mason (1986) to create a framework that concerns itself with the cases of IS.
Research ethics	Research ethics are concerned with the morally responsible conduction of research, abiding by a multitude of different principles.*
Codes of ethics	Codes of ethics are descriptive outlines of what type of behavior is expected of members of an organization, a profession or an industry from an ethical point of view (Crane and Matten 2016).
ETHICS	Effective Technical & Human Implementation of Computer-based Systems (ETHICS) describes a concept created by Enid Mumford, which focusses on the non-technical aspects of systems design. It has a human as well as an organizational focus (Mumford 1996).
<b>Ethical issues</b>	
Ethical issues	Ethical Issues are seen as the ethical problems that arise from the use of a particular technology or its embedding in an organization.*
<b>General ethics</b>	
General perspective	We subsumed other approaches in ethics research in the category of general ethics.*

**Table 2. Definitions of Ethical Concepts in IS**

*\*In the course of our research, we formed the respective definitions as umbrella terms for various concept groups.*

*ETHICS* (Effective Technical & Human Implementation of Computer-based Systems) has a human as well as an organizational focus (Varghese 1997). Because of the human-centric approach of the concept, it can be applied to ethical issues in system design, like Hirschheim and Klein (1994) did when mapping the concept to emancipatory principles of information system design, since it aims to have a positive impact on the everyday life of the workers involved. Similarly to the human centric design of ethics, the principle of ethics-by-design arose in IS research (e. g. Spiekermann and Winkler 2020).

Our sample has shown that – in the field of IS – *ethical issues* are seen as the ethical problems that arise from the use of a particular technology or its embedding in an organization. We identified two types of publications in this category. The first one seeks out to identify these issues so that they can be addressed by practitioners or researchers in the future (e. g. Martin 2015; Mason 1986; Wakunuma and Stahl 2014). The second type either addresses these issues directly or draws attention through a focused discussion in their research projects and takes appropriate action (e. g. Faik and Walsham 2013; Smith 2008).

We subsumed other approaches in ethics research in the category of *general ethics*. Here, we mostly found quantitative and qualitative approaches to ethics research, such as studies concerning ethical behavior of IT and IS professionals (Khouja and Park 2014; Leonard and Cronan 2001) or the elicitation of ethical values (Vance et al. 2020). Many of these approaches included ethical decision-making (e. g. Moores and Chang 2006) or the ethical climate in organizations. An ethical climate within an organization gives members of this organization answers to the question of how to behave in certain situations via perceived prescriptions, permissions etc. (Victor and Cullen 2008). Yazdanmehr and Wang (2016) conducted a study in regards of employee security compliance, drawing – among other resources – upon ethical climate literature.

## **IS Concepts**

In the following section, we give an overview of the different IS concepts we encountered in our research. These concepts are subject of application of the ethical concepts we described in the previous section. Table 3 provides an overview of the terms and their definitions.

Ethical concepts have been applied to numerous different technological or organizational concepts. Lynne and Mentzer (2014), for example, considered the negative consequences of ICT, identifying and evaluating tools to solve the problems that go along with ICT. In the context of *Artificial intelligence* Jöhnk et al. (2021) conducted an interview-based study of the AI-readiness-factor in companies, considering ethical questions such as gender biases in sets of training data. Martin (2019) examined the design of algorithms for AI. The research is concerned with deliberately designing algorithms as black boxes, thus making them harder to understand and errors harder to fix. *Big data* was analyzed by Martin (2015) in terms of ethical issues of reselling consumers' data – proposing possible solutions to make said industry sustainable. *Social media*, is also often subject of ethical considerations, for example did Harrison (2018) develop a model to determine whether and how social media can increase a person's willingness to enact fraudulent behavior. Within *social media*, cyberbullying often is a point of interest - specifically in regards of approaches to explain the unethical behavior (Lowry et al. 2016) and to prevent it using design mechanisms (Lowry et al. 2017). For *IS practitioners*, Lynne and Mentzer (2014) analyzed a set of tools to equip practitioners of IS with the ability to assess the impact of ICT. In doing so, they relied on ethical considerations, such as the ACM code of ethics. *IS research* has been considered by Loos et al. (2013) to give a brief discussion about research methods used, particularly in BISE articles - focusing on ethics from medical computer science. Similarly, Myers and Klein (2011) propose principles for critical IS research.

Concerning *healthcare*, Turja et al. (2020) investigated the extent to which robot caretakers are accepted or not - paying particular attention to ethical values. Al-Dhaen et al. (2021) investigated the intention to use the internet of medical things and how ethical considerations do play into this. *Organizational management* has been considered by Feng et al. (2019) who explored leadership in the context of employee behavior, specifically in the case of information security compliance. Often, cyberloafing (Koay et al. 2022) and other compliance oriented practices are the focus of research. *Piracy* is often addressed (Gopal and Sanders 2015) as a misuse of ICT (Peace et al. 2014). *Privacy* has been discussed by Newell and Marabelli (2015), focusing on the issues arising from the increasing number of devices that generate data through monitoring the occurrences in an individual's daily life. A more specific problem is looked at by Rowe et al. (2020), they examine the failure in design and adoption of the French government's Stop-COVID app, especially considering a lack of transparency.



Concept	Definition
ICT in general	ICT in general covers different employments of information and communications technology by either individuals or groups of people.*
Artificial intelligence	AI is concerned with understanding and building intelligent machines that can act effectively and safely in a wide variety of situations (Russell and Norvig 2021).
Big data	Big data refers to large sets of data, having high volume, variety and velocity – given that large amounts of heterogeneous data are generated at a very high rate (Gandomi and Haider 2015).
Social media	Social media denotes a set of tools, designed to be used by three or more people (Conner 2012).
IS practitioners	IS practitioners are professionals working in the field of IS. This category is concerned with the tasks and problems they face in their daily professional lives.*
IS research	IS research considers different aspects, especially ethical or unethical practices or research methods, of how to conduct research on information systems.*
Healthcare	
Knowledge Management	Knowledge management is concerned with the creation, storage and usage of knowledge within an organization (Wewer and Fischer 2019).
Organizational management	Organizational management considers different approaches to employ IT in organizations or to introduce rules regarding its usage.*
Piracy	Piracy denotes the unauthorized use, duplication or distribution of software and digital goods (Weik 2001).
Privacy	Privacy is the limited access to a person. Information privacy determines how, when and to what extent and individual offers information about themselves to another entity (Hung and Cheng 2009).
Security	Security, IT Security or cybersecurity is concerned with the protection of information and communication technology systems and their respective components, against threats that aim at harming, disabling, and destroying the software and hardware (Wurzenberger et al. 2019).
System design	System design can be both, the development of hardware and software architecture for a system to address specified functional or non-functional requirements or it can be considered as the configuration of methods, procedures, or techniques to satisfy specified functional or non-functional requirements (Weik 2001).
Technology adoption	Technology adoption is the first time of an individual, a firm or another other agent to use a new technology (Forman et al. 2018).
E-commerce	E-commerce describes business, trade, and marketing carried out via electronic media, such as computers and the internet (Weik 2001).
Teaching of IS	The teaching of IS is an important topic to prepare future practitioners and researchers of IS with the knowledge to deal with ethical issues. For this reason, authors apply ethical issues to the curricula and provide a set of methods to handle these.*

**Table 3. IS concepts that are subject of ethical considerations**

\*In the course of our research, we formed the respective definitions as umbrella terms for various concept groups.

*Security* was, for example, researched by Anderson et al. (2017), who propose an information security control theory which offers a framework to understand the information security policy development process. The violation of security protocols is concerned by Siponen and Vance (2010), specifically how and why employees violate security protocols. In terms of *System design*, Dadgar and Joshi (2018) investigated the design and development of self-management ICT for medical purposes. Hirschheim and Klein (1994) mapped the ETHICS principle to emancipatory principles in IS system design and development, focusing on the everyday life of workers. Córdoba and Midgley (2008) consider information systems planning outside of the scope of organizational boundaries, establishing the review of boundaries within the planning process. *Technology adoption* has been reviewed by Hansen and Baroody (2020), who have examined it in terms of privacy and electronic health records. Similarly, Sun et al. (2016) have done so with regard to big

data, identifying ethical issues. In terms of healthcare, Au et al. (1996) debated ethical issues on telemedicine. *E-commerce* has been reviewed in terms of ethics continuously over a long period of time. Wood (1992) reviewed the ethical issues in commerce and surveyed trust in regards of online shopping, for example. *The teaching of IS* also considers the dealing with ethical issues – for example Stevens et al. (2010) assessed skills deemed important by IS professionals, putting emphasis on ethics and privacy issues.

## Discussion

### *State of the Art*

Table 4 puts the different ethical concepts and the fields of application in IS into contrast. The numbers define the amount of items we found in our sample – every source contained at least one ethical item and one item from IS, but could also include more than one in each area. The high number of publications shows that many researchers are intensively dealing with the topic of ethics in IS, and thus also initiate and promote the discussion with qualitative statements. To enhance readability, we decided to group the fields of application into sub-groups, namely the general view, the managerial view, the technological View, the social View, the design perspective, and the meta-view.

In terms of ethical concepts, *applied ethics* is used more widespread than *ethical theories*. *Ethical theories* are little used in relation to all other ethical subjects of consideration. *Discourse* and *virtue ethics* are leading in terms of mentions, although these are also mainly used in the field of application of *IS research*. *Virtue ethics* are also used in the field of *organizational management*, which can be explained by their long tradition in the context of *business ethics* (Crane and Matten 2016). However, both could also be used in other contexts, such as the *teaching of IS*, to teach virtuous behavior or discourse-oriented problem-solving approaches to future practitioners. They could also be applied in the field of *security, privacy* or *healthcare*. In any case, it needs more pioneer publications, such as Chatterjee et al. (2009), Rowe (2018) or Walsham (1996). For *applied ethics, business ethics, codes of ethics* and *AI ethics* are the most prominent fields. Depending on the application, *AI ethics* could be used in the other fields of application in the technological view or in *system design* like Newell and Marabelli (2015) reviewed algorithmic decision-making problems in regards of business strategies and the social and societal issues. *Codes of ethics* and *business ethics* do have their most mentions in the category of *organizational management*, but are also of great interest for practitioners of IS. They need to be adapted continuously to novel situations and technological developments. This in turn can only be achieved by assessing the relevant ethical issues and considering state of the art approaches from the field of applied ethics and ethical theories.

For the *general perspective*, methods for collecting ethical variables, such as values or the behavior of individuals in ethical dilemma situations, are well positioned in terms of the number of publications and use cases. In particular, ethical behavior already has a large body of literature in the context of organizational management, security and piracy. In contrast, in the area of teaching of IS and social media, there is still unexplored territory in research.

For the fields of application, the area of *organizational management* holds a great number of publications. The areas of *IS research* and *IS practitioners* also have a good basis of publications. Other areas such as *big data, social media* and *healthcare* are gradually becoming more prominent and should be further expanded in the future. In terms of content, these could be combined well with research on *security* and *privacy*, although these application areas already have a good number of research projects. *Security* and *privacy* in particular have had very few studies with *ethical theories* as a basis, with *privacy* being the absolute pioneer with regard to *ethical issues*. It may be possible to discuss some of these issues using *ethical theories*.

The *social view*, especially the field of *adoption*, is still in its infancy as far as ethics research in IS is concerned. Especially in the area of *ethical theories* and *applied ethics*, there are some interesting possibilities for combination. The *meta view* has a solid number of publications, with the majority stemming from the *general perspective* and *ethical issues*. *Teaching of IS* could receive more attention as future practitioners have to deal more and more with ethical issues, due to a steadily growing general interest in ethical IT systems and ethical IS, as we have shown in the introduction. Especially in regards of *IS practitioners* and *teaching of IS, ethical theories* could provide a solid foundation for the identification and evaluation of ethical problems.

		General view (128)				Managerial view (314)				Technological view (528)				Social view (131)			Design perspective (94)		Meta view (361)	
		ICT in general	Organizational m.	Knowledge m.	Healthcare	AI	Security	Privacy	Piracy	Big Data	E-Commerce	Adoption	Social media	System design	IS practitioners	IS research	Teaching of IS			
General perspective (900)	General ethics	43	67	17	24	34	47	47	38	21	32	5	19	32	53	49	17			
	Ethical behavior	15	34	4	4	4	23	9	29	2	13	3	3	8	20	10	3			
	Ethical climate	1	4	1	1	0	3	1	0	0	0	0	0	0	0	0	0			
	Ethical dilemma	3	5	0	4	1	6	4	1	1	0	0	0	1	6	9	0			
	Ethical decision-making	4	8	0	2	3	5	2	10	1	1	0	0	0	6	4	2			
	Ethical values	10	10	6	4	4	7	2	3	1	0	2	1	8	3	10	0			
Ethical issues (211)	Ethical issues	16	19	4	9	24	14	23	13	9	11	2	6	16	18	17	10			
Applied ethics (384)	Business ethics	2	15	4	1	3	7	4	1	1	9	0	3	2	10	4	4			
	IS/IT ethics	4	8	1	0	0	6	5	9	1	3	0	1	5	12	6	2			
	Computer ethics	2	2	2	1	4	3	2	3	0	0	0	0	2	8	3	5			
	AI ethics	0	1	2	6	26	0	0	0	0	0	0	1	0	0	1	0			
	Research ethics	0	1	0	0	0	0	0	0	0	0	0	0	0	0	11	2			
	Codes of ethics	13	20	3	4	3	21	14	13	3	10	1	1	4	15	8	2			
	ETHICS	4	1	0	0	0	0	0	0	0	0	0	0	12	2	8	1			
Ethical theories (61)	Virtue ethics	4	5	3	0	2	0	3	0	0	0	0	0	2	1	3	1			
	Discourse ethics	2	0	1	0	0	0	0	0	0	2	0	0	2	1	6	0			
	Confucian ethics	1	2	2	0	0	0	0	0	0	2	0	0	0	4	1	0			
	Utilitarianism	1	1	0	0	1	0	1	0	0	0	0	0	0	0	1	0			
	Value ethics	2	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0			
	Duty ethics	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0			

**Table 4. Ethical and IS Concepts**

Note: To increase readability, we colorized the number of items per cell: 0 mentions: white; 1-10 mentions: light grey; 11-20 mentions: medium grey; 20+ mentions: dark grey. M. reads as “Management”

### Categorization of ethics research in IS

Through the analysis of the various publications, we noticed some similarities and differences. We found that, depending on the research focus of the publications, said publications can be classified into one of four categories. From these categories, we developed a classification systematic. We are able to categorize our findings into four different groups, depending on whether *ethical theories & applied ethics* and *ethical issues* are considered in the research design or not. The result is depicted in Figure 1.

Ethical Theories & Applied Ethics		Ethical Issues
No	Yes	
<p>Practical Perspective: What are the ethical issues?</p> <p>Mason (1986)</p> <p>Ashman et al. (2014)</p>	<p>Theoretical and Practical Perspective: How can the ethical issues be solved using theory?</p> <p>Newell and Marabelli (2015)</p> <p>Schlagwein et al. (2019)</p>	Yes
<p>Explorative Perspective: What is perceived ethical?</p> <p>Leonard et al. (2004)</p> <p>Spilda et al. (2020)</p>	<p>Theoretical Perspective: What are the possible actions?</p> <p>Mingers and Walsham (2010)</p> <p>Chatterjee et al. (2020)</p>	No

**Figure 1. Categorization of Ethics Research in IS**

If both, *ethical issues* and *ethical theories & applied ethics* are considered, the knowledge derived from the ethical background is used to confront practical problems. If only *ethical issues* are considered, this leads to the identification and discussion of (practical) ethical problems in the domain of IS. If only *ethical theories & applied ethics* are considered, the research dives into the realm of theory, identifying new courses of action on a theoretical basis. This can for example happen in adding to or expanding upon a certain field of applied ethics, or in using ethical theories to generate new opportunities for acting. If neither of both is considered, an *explorative perspective* is taken, either quantitatively or qualitatively evaluating what is perceived ethical. These valuable results can then in turn lead to the identification of new ethical issues on the practical side or to advances in the area of ethical theories & applied ethics. Such publications can, for example, be studies that assess ethical values, but also opinion papers that make qualitative statements. In the following, we give two examples of research fitting into each of the categories.

The *theoretical and practical perspective* focusses on the solution of *ethical issues*, using *ethical theories* or *applied ethics*. An example is the work by, Newell and Marabelli (2015), providing a profound overview of the application of different *ethical theories* in algorithmic decision making. *Ethical issues* are used to define the problem and the fields of action. Later, these ethical issues are broken down into different ethical theoretical approaches and solutions are proposed. Schlagwein et al. (2019) similarly identifies ethical issues in regards of crowdsourcing, identifying major themes and norms and then in turn discussing these whilst applying Habermas's discourse ethics.

In regards of the *theoretical perspective*, ethical theory in IS has, for example, been employed by Mingers and Walsham (2010) in applying discourse ethics to the field of IS. The paper discusses a pragmatic approach for IS practitioners and researchers alike, giving different examples where and how this ethical theory can be applied. Chatterjee et al. (2020) used a virtue ethics perspective to research organizational innovation, investigating the concept of organizational courage. Here, also an organizational perspective is taken in researching the actors of ethical (virtuous) behavior, using a top-down approach from the ethics perspective.

For the *practical perspective*, ethical issues have been an important part of IS since a long time. Mason (1986) has established a good overview that has subsequently been used by many researchers to identify further problems and make IS more ethical. Similarly, Ashman et al. (2014) did examine the field of e-learning and provided different ethical issues that arise from utilizing these systems.

In case of the *explorative perspective* – which seeks to identify what is perceived as ethical – insights can be used to extend existing applied ethics, for example like Leonard et al. (2004) did for IT ethics. This field of applied ethics is hereby extended by a scenario-based study to investigate the ethical decision-making of IT professionals. Ustek-Spilda et al. (2020) provided a similar approach in questioning users about their ethical views of IoT devices. Their topics and concerns were then again evaluated and offer a valuable contribution to both, ethical issues to be solved and applied ethics to solve them. As one can see, this field influences the other fields by pointing out ethical concerns that then can in turn be evaluated as ethical issues, or, by adding to ethical theories & applied ethics.

### **Further research opportunities**

Our categorization scheme from Figure 1 gives us the opportunity to take a closer look at the individual sections. These sections can be expanded with future research projects, for which we will derive research propositions below. We structured our propositions in the categories of our previous scheme. In regards of the *theoretical perspective*, research needs to approach ethical problems with background-knowledge in mind in order to solve them holistically. In the past, several successful approaches have been made to map ethical theories to the domain of IS and demonstrate possible actions (e. g. Schlagwein et al. 2019; Stahl 2008). IS as a discipline could largely benefit from a holistic theoretical perspective that tries to transfer different fields of ethics research to the realm of ICT and information-related problems.

From this reasoning, we abstract the following proposition:

**Proposition 1:** A holistic perspective on ethical theories and applied ethics can aid in finding possible actions to solve ethical issues in the realm of IS. These actions can take numerous forms such as enhancements of digital ethics or specific codes of ethics.

For the *theoretical and practical perspective* where, ethical theories and applied ethics are used to find solutions for ethical issues, we can see a lot of isolated use cases. In the cases of piracy and other unethical uses of ICT, approaches have been made to identify the values and motivations of the individuals abiding to these actions (Moore and Chang 2006). In applying different ethical theories to the use cases of IS and identify possible actions and implications, different approaches exist (Kim et al. 2018; Vance et al. 2020), resulting in a series of example cases for the respective field of application. In the recent past, IS has placed a focus on the ethical evaluation and the design of systems (Martin 2019; Spiekermann and Winkler 2020), this also poses the starting point for future research. If these items were to be worked on, they would provide the discipline with a good set of tools to ethically evaluate and discuss future problems.

From this reasoning, we abstract the following propositions:

**Proposition 2.a:** The ethical theories and applied ethics identified can be matched to the various IS concepts presented and their ethical issues - a possible solution to the issue can then be found using the applicable theories.

**Proposition 2.b:** The existing frameworks can be extended and embedded into a unified evaluation framework. This framework can provide scholars and developers with the opportunity to focus more on the ethical development and redesign of systems.

In terms of the *practical perspective* and the identification of ethical issues, different approaches have been undergone (e. g. Fichman et al. 2014; Smith et al. 2011). In order to evaluate ethical issues appropriately, researchers need a certain knowledge about the respective domain - to gain this knowledge, they must thoroughly study the subject area. The approach within IS could be enhanced with a tool to holistically identify possible ethical issues in systems and organizations. This tool could be a procedure, regarded as a standardized approach that facilitates the identification of ethical issues. This would allow researchers to comprehensibly and comparably gain insight about existing ethical issues.

From this reasoning, we abstract the following proposition:

**Proposition 3:** To thoroughly identify ethical issues in systems and organizations, a procedure fit for the domain of IS is needed.

For the *exploratory perspective* to identify the different values and ethical views of IS scholars, practitioners and users of ICT, numerous different approaches have been made, for example, adoption-based studies

(Srivastava et al. 2016) or confronting people with ethical dilemma-situations (Leonard and Cronan 2001; Paradise 1990). The research domain could benefit from an integrated, configured framework to identify the ethical perceptions of the people concerned by the topics of IS research. Such a framework could contain knowledge and models to specifically investigate ethical stances, values and perspectives.

From this reasoning, we abstract the following proposition:

**Proposition 4:** The exploratory perspective can benefit from an integrated framework which configures the existing methods that lead to the identification of values and ethical stances.

### **Limitations**

We need to acknowledge some limitations to our research. Firstly, we only considered articles in journals but not conference papers or (practice-oriented) textbooks. Due to that, we might lack practitioners' perspectives on the use of ethics or certain ethical issues in IS. Regretfully, we did not have full access to the Journal of Computer Information Systems. In the sample of 750 articles for further investigation, 51 stemmed from the Journal of Computer Information Systems and for 26 of these, we were only able to analyze the abstract and keywords. Since this number is comparatively small in the overall context and the journal is not in tier 1 or tier 2 according to Lowry et al. (2013), we acknowledge this limitation but believe it is not overly significant.

### **Conclusion**

This article has set out to examine the state of ethics research in the context of IS. For this purpose, we conducted a literature review with the 21 most influential IS journals. This enabled us to (1) provide an overview of the state of the art of ethics research in IS and (2) identify 20 different ethical constructs, which we summarize into four different groups, and 16 different fields of application. We did show that ethics is of growing importance for the context of IS and were able to (3) contrast the different manifestations of ethics research in IS, thereby spotlighting well-covered areas and highlighting a number of research gaps. In addition, we (4) managed create a classification scheme for the different ethics research projects and (5) derive research propositions for future projects.

Our findings allow us to make some implications for the field of digital ethics in IS. For practitioners, we offer a systemization to draw upon as depicted in tables 2 and 3, aiding them to find solutions fitting for their respective ethical issues. Scholars on the other hand can identify avenues for future research and are able to review prior research in the field. With our categorization, depicted in figure 1, researchers are able to systematically categorize ethics research within IS. Our research propositions, provided in the discussion section, give researchers the opportunity to dive deeper into the topics of ethics in IS and to advance the field. Other research approaches such as text mining or big data analysis could additionally allow for a more in-depth analysis of the literature in the area of digital ethics. It would be of great merit for the discipline as a whole to have more research with a primary focus on ethics in IS.

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