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A broad meta-scientific overview of ethical aspects in Brazilian research on Web, Hypermedia and Multimedia at the WebMedia symposium

Luiz Paulo Carvalho [**Universidade Federal do Rio de Janeiro** | ***luiz.paulo.carvalho@ppgi.ufrj.br***]
José Antonio Suzano [**Universidade Federal do Rio de Janeiro** | ***jose.suzano@matematica.ufrj.br***]
Flávia Maria Santoro [**Universidade Estadual do Rio de Janeiro**| ***flavia@ime.uerj.br***]
Jonice Oliveira [**Universidade Federal do Rio de Janeiro** | ***jonice@dcc.ufrj.br***]
Maria da Graça Pimentel [**Universidade de São Paulo** | ***mgp@icmc.usp.br***]

The inaugural meeting of the Workshop on Multimedia and Hypermedia Systems, now known as WebMedia, took place in 1995, one year after the founding of the World Wide Web Consortium (W3C). While the tram was still departing the station, Brazil boarded it. However, Tim Berners-Lee offers harsh criticism of the Web's effects, applications, and uses three decades after he lay the Web's conceptual cornerstone. Such as false information, widespread manipulation, the unethical use and exploitation of personal information, corporate monopolies, and dangers to democracy. He followed and kept abreast of the moral implications of the Web. However, did WebMedia also stay up in this context? We followed the Systematic Literature Review methodology with the aim to answer how WebMedia research published between 2005 and 2022 explicitly incorporates ethics. We analyzed 1331 papers, 52 (≈4%) presented ethical aspects, and, from these, one stood out. We concluded that the ethical aspects remained tiny, considering the time coverage. Less than 10% of the publications presented some ethical aspects, including the respective research. The occurrences of Ethics Committee, Informed Consent, or a combination of both did not reach 2% of the publications. Even though the Web and Multimedia are cross-cutting themes in technical and non-technical aspects, the first is dominant. In contrast, the deliberations related to the second are limited, as well as on Ethics or Morals. Therefore, we propose guidelines for community appreciation, embracing a culture of ethical aspects. Our main contribution is bringing a meta-research perspective on ethical aspects dedicated to WebMedia.

Keywords: *Ethics, Meta-science, WebMedia, Multimedia, Hypermedia, Web, Systematic Literature Review*

1 Introduction

Thirty years after inventing the Web, Berners-Lee released an open letter pointing out that the Web had been used both for positive and negative purposes (Tim Berners-Lee, 2019), the latter a reference to opportunities created for scammers and those who spread hatred, as well as making all kinds of crimes easier to commit. He claims we should not blame one government, social network, or human spirit. This realization shatters the hypostatized idea that changes start from the Web or the Internet as substantive. Instead, occur through them. The people, governments, and companies have brought about these changes (Vázquez, 2018). We can question the ethical aspects of this change through morals and values, as Ethics is the field of philosophy that deals with human practices.

One year after the foundation of the World Wide Web Consortium, in 1995, Brazilian researchers organized the "First Workshop on Multimedia and Hypermedia Systems" – evidence of how up-to-date the Brazilian community was. Recognized as the most significant Brazilian academic-scientific event on Hypermedia, Multimedia, and the Web, in 2003, the event's name changed to "Brazilian Symposium on Multimedia and Web Systems" (WebMedia).

Shortly after the first edition of WebMedia, in 1996, the Brazilian National Health Council published an official regulation on Brazilian Research Ethics, 196/1996 (Brasil, 1996) (currently updated by 466/2012 (Brasil, 2012)) — presenting the guidelines and regulatory standards for research involving human subjects, and defining that any research involving the participation of humans must be submitted and appreciated by an Ethics Committee (EC).

Regarding Computer Science research, the regulation on Brazilian Research Ethics relates to Berners-Lee's concerns relative to the Web, as well as to other areas such as collaborative work (Carvalho et al., 2022a) and human-computer interaction (Carvalho et al., 2022b). Such a scenario inspired us to investigate answers to the research question: *how does ethics explicitly permeate WebMedia research?*

We report quantitative and qualitative results, from a Systematic Literature Review (SLR) (Kitchenham, 2004; Kitchenham and Charters, 2007) method, regarding a panorama of ethical aspects involving the sixteen editions of WebMedia of which proceedings are available [1] at the Association for Computing Machinery (ACM) Digital Library (2005–2022). We deal with the ethical aspects of Hypermedia, Multimedia, the Web, and the respective research, including a meta-research perspective.

We analyze *how* Information and Communication Technology (ICT) affects morality and human values, since the question of whether it affects or not has been responded to positively already (Kugler, 2022). Exemplifying, we briefly outline one of the Web and Hypermedia classics,

[1]The proceedings of the 2007 edition is missing at the ACM Digital Library.

the use of Wikipedia content in academic-scientific communications. Since not only our work dialogues with Wikipedia references, relying on this collaborative knowledge-building system while checking sources and references, but also WebMedia research involves Wikipedia (e.g. (Fernández Pinto, 2020; Ngomo et al., 2020; Marques et al., 2020; Vidal et al., 2012; Hanada et al., 2013; Santos et al., 2019)) and refers to Wikipedia (e.g. (Bertalan and Ruiz, 2019; Lima et al., 2019; Henrique et al., 2014)).

As our ethical choice, we found materials with positive (Kern, 2018) and negative (Denning et al., 2005) moral recommendations about citing and referencing Wikipedia content. Our moral action pondered both views. While turning to Wikipedia without acknowledging its problems and shortcomings is an ethical deficiency, the same applies to rejecting it without considering its benefits and advantages. From a perceived value perspective, if it "were that horrible" no research or researcher would involve it in their academic-scientific communications and practices if not to tear it apart.

The results of the present SLR, on the one hand, expose the deficient scenario of WebMedia regarding ethical aspects and, on the other hand, reveals ample space and opportunity to debate, especially in the Brazilian context. Of more than a thousand papers analyzed, only in 2020 did we find one (Oliveira, 2020) considering relevant ethical aspects. The maturation of WebMedia research could have brought with it a greater appreciation of ethical aspects, and although this has not happened, there is still time for that.

We discuss the scarcity of ethical or moral aspects in WebMedia, related to the event or broadly to the Brazilian scenario concerning Web, Multimedia, or Hypermedia. We extend the considerations on the shallow occurrence of EC and Informed Consent (IC), the relationship between ethics and technique, the syntactic and semantic problems disseminated in several Brazilian computational scientific events, and the precariousness of research methodology in WebMedia, among others.

This paper is structured as follows. Section 2 provides the theoretical foundations; Section 3, Related Works; Section 4, methodology and research method; Section 5, results; Section 6, discussion; and final remarks in Section 7.

2 Theoretical Foundations

Among the several possible definitions of Ethics, we dialogue with:

> "Ethics is the formal process of intentionally and critically analyzing, with clarity and consistency, the basis for one's moral judgments" (Glover, 2017)

Ethics, as an area of knowledge, deals with ethical dilemmas, with Morals and Morality as subjects (Singer, 2022); promotes parsimony between the individual and the collective, analyzing human practices and acts, as well as their impacts, influences, and consequences (Ferraz, 2014). Ethical deliberation occurs through reason and rationality, considering the context and the environment as mandatory external variables (Ferraz, 2014). Traditionally, Ethics resorts to the Greek tripartite interpretation, desire (or pleasure), emotion, and reason (Pegoraro, 2013).

We can use the term as a quality, which deserves an extended explanation. It is crucial to untangle a common sense knot in this usage. Ethics is a quality attributable to practices, customs, habits, or traditions, not other things (Vázquez, 2018). Common informal usage qualifies things as "ethical" as long as they conform to prevailing morality, whether tacit, such as implicit social agreements, or explicit, such as published laws or regulations. For example, a researcher "is ethical" because he submits his research involving human participants to an EC; research "is ethical" because it has been submitted to an EC; professional practice "is ethical" because it follows the organization's code of conduct, among others.

On the other hand, proper usage treats rationalized and reasoned practices as ethical. Pondering whether or not to submit research to an EC qualifies this action as ethical, not just submitting because laws or regulations (Brasil, 2012, 2016) oblige. The same is true for IC. Currently, moral research practice stipulates IC as a rule, but its absence is also possible as an exception (Salganik, 2017). In research, "obtaining Informed Consent" is no longer an ethical dilemma, which exempts this practice from ethical deliberation. For example, assessing ICT employees' depressive symptoms related to moral harassment demands IC. However, in research analyzing racist behavior through online forum interactions with white supremacists, obtaining IC is illogical, i.e., ethical deliberation, moral consideration, and rational choice exist.

Ethical practice depends on conscience, freedom, reason, and accountability (Vázquez, 2018), i.e., if a software engineer plagiarized a code consciously and freely and reasoning about this act, he/she is acting ethically. Which does not mean he/she is acting morally. Suppose this software engineer's boss forced him/her to use the plagiarized code under threat of dismissal. In that case, there is a loss of freedom, so it is impossible to conduct an ethical investigation of this act. Even so, it is possible to investigate the boss's practice ethically.

The Theory of Values embraces Morals as we consciously or subconsciously value each action. This valuation makes us decide the course of action. Between alternative A or B of how to act, ethical consideration allows someone to consciously, freely, and rationally choose A or B [2] (Vázquez, 2018). To make this decision, we use our values to guide us (Singer, 2022).

The intersection between Ethics and Computing dates back to the 1950s, although it only gained considerable momentum in the 1990s. Initially, Computing Ethics (CE) appears in curricula as a discipline, posteriorly on conferences, publication of several books, and forming an academic-scientific community, arousing some critical mass (Bynum, 2018).

Several fronts sought to situate CE philosophically. From a taxonomic perspective, we have Ethics as a

[2] Obviously, this is an oversimplification of the real and concrete complexity of ethical decision-making. In most cases, the range of options will be greater than two, including the possibility of the decision-maker not knowing possible courses of action to follow, in good or bad faith.

significant area of Philosophy (Moral Philosophy), from which Applied Ethics starts, and CE is part (Barger, 2008). Some perspectives think differently. Some authors argue that the ethical dilemmas of Computing are generic, so Computing would only be the means and channel for them. Others argue that Computing offers its ethical dilemmas and generates new ethical dilemmas inherent to its existence. Others argue that CE starts from the professional perspective, placing Professional Ethics as a foundation. While others argue that at a given moment, ICT will be so culturally omnipresent in our society that CE dilemmas will be generic dilemmas, absorbed into our daily lives (Bynum, 2018).

As a well-established definition in the literature on the subject, Hall (2014) defines CE as:

> "Computing ethics is the interdisciplinary and collaborative efforts of scholars and professionals to methodically study and practically affect the contributions and costs of computing artifacts in global society" (Hall, 2014)

CE involves many topics beyond exclusively technical aspects. For example, a collectivized organization's professional code of ethics, such as the ACM, or specific companies (Gotterbarn et al., 1997). Other recurring topics in CE are Privacy, Information Security (e.g., "hacking"), Laws and Norms, Freedom of Expression, and Surveillance, among others (Stahl et al., 2016). With Multimedia and the Web pervading society more and more, we see a growing interest in ethical dilemmas related to these areas (Kizza, 2016; Baase and Henry, 2017; Blundell, 2021); as well as society responding to them, proposing laws [3].

CE and Research Ethics relates (Recker, 2021; Salganik, 2017), subject to the normative acts institutionally govern Research Ethics in Brazil. Resolution 466/2012 "Guidelines and regulatory norms for research involving human beings" (Brasil, 2012), and resolution 510/2016 "Norms applicable to research in Human and Social Sciences whose methodological procedures involve the use of data directly obtained from the participants or of identifiable information or that may entail greater risks than those existing in everyday life" (Brasil, 2016). Above this institutionalized ethics is the researcher's ethics, which can serve either as a complement or, if alienated from institutional determinations, as an essential professional guide. In normative acts, there is currently no objective and explicit normative act on using and manipulating personal data extracted from Online Social Networks (OSN). Hence, the ethical consideration is at the discretion of the researcher in most cases. Is there an ethical dilemma in using Twitter text published by a profile configured as public?

An EC must appreciate all computing research with human participation or involvement. From the researcher point of view, some cases are possible, in a scenario of freedom, conscience, and rationality. The researcher (i) considers the alternatives of submitting and not submitting, and then submits – it is ethical decision-making in moral conformity; (ii) considers the alternatives of submitting and not submitting, and then does not submit – it is ethical and immoral decision-making; (iii) the researcher neglects any reflection on this topic – it is unethical (ethically deficient) and immoral decision making. There is one last case, related to ignorance (Vázquez, 2018).

Ignorance is a complex issue to deal with and hold accountable in the academic sector, while it is the antithesis of reason. One of the primary functions of academic-scientific dynamics is to deal with ignorance. An ignorant person is incapable of making a decision that is totally categorized as ethical, impaired in one of the primordial elements of ethical decision-making, reason/rationality.

Here the scenario becomes more complex, as we encompass the various variables and dimensions of reality. It is very simple to attribute all responsibility for rationalization solely and exclusively to the researcher, as an isolated piece in a linear and simple system. There is a set of dynamics, powers and agencies around the researcher, co-responsible.

Two points are fundamental. First, no one is affected with *a priori* knowledge about the existence of IC or EC. Knowing IC or EC and having the atomic notion of their mere existence are two completely different states. For example, if a graduate student had an entire course of formal institutional training without any pointers indicating the existence of IC or EC, it is unreal to expect that this student would "naturally" or "deductively" conceive its existence.

Second, there is a complex social and cultural structure behind the agency of these elements, as well as the value attributed to Research Ethics. So there is a potential possibility that these elements are neglected, ignored or even purposefully omitted, due to implicit or explicit negative valuation. Several computing academics have a negative view and review of EC (Amorim et al., 2019) (even the EC idea), which potentially brings them closer to the risk of neglecting these elements in the agency of their communication, formal or informal.

As will be elaborated on in Section 6, consider the formal scenario in which a student analyze some papers, evaluate them, seek ideas for their research, conduct a literature review, among others. If this occurs through WebMedia communications and proceedings, the chance of this student encountering IC or EC is almost negligible. There is a much higher probability of: (i) finding researches without human involvement or participation; (ii) finding researches with human involvement or participation, which simply neglected IC or EC and, even so, were accepted for publication and are published. That is, it is a non-trivial structural arrangement, without necessarily a single culprit or simple accountability.

We reiterate that research from master's dissertations and doctoral theses, if they involve human participation (and do not fall under the exceptions), must be submitted and appreciated by an EC (Brasil, 2012, 2016). For example, a graduate student has a mandatory course in Scientific or Research Methodology. The syllabus of this course covers Research Ethics and related topics (EC and IC included). He attends the class disinterested, takes the course exam only out of obligation, is approved, and when he goes to carry out his research, he ignores the human participation factor. Despite having information about IC and EC, he prefers to ignore these elements and conduct his research as he wants and as he sees fit, leaving aside any ethical deliberation.

[3] `https://www25.senado.leg.br/web/atividade/materias/-/materia/141944` [accessed 08-08-2023]

This is an example of an unethical scenario, with freedom, conscience, and reason, and even so, neglecting, devaluating, and disregarding ethics.

In any research, whether applied, practical, conceptual, theoretical, literature reviews, pragmatics, essays, whatever, there is room for ethical deliberation, whether as an application or about the respective research (meta-research) (Recker, 2021; Ioannidis et al., 2015; Ioannidis, 2018; Carvalho et al., 2022b). There are several ethics-related issues, such as responsibility, benefit, risk, transparency and openness, accountability, harm, principles, contracts, laws and norms, pain, and happiness.

A well-applied and analyzed Research Ethics safeguards the procedures to protect the human participants or those involved in the research ANPEd (2019, 2021); Bos (2020); Recker (2021). Despite the controversial criticisms of the EC and the CEP/CONEP system (Lima, 2015; Chimentão and Reis, 2019), we reinforce that the simple involvement and approval by an EC represents a positive unitary (considering one case only) moral advance regarding the involvement of Research Ethics and in the moral contemplation of the participants or involved, also safeguarding them. EC approval or involvement in the research project is not a sufficient or necessary condition for the best possible ethical appreciation, even so it is a significant objective moral and institutional advance compared to inaction or negligence.

Law and ethics are not synonymous or equivalent, as illustrated by the case of the General Personal Data Protection Law (in Portuguese, *Lei Geral de Proteção de Dados Pessoais* - LGPD), (Brasil, 2018). The ethical discussion around the personal data protection goes beyond the law. Some authors believe that legislation for data protection is very ineffective or useless, fully defending the prohibition of private business transactions involving personal data as a "commercial product" (Zuboff, 2019; Véliz, 2020). For example, research that helps stakeholders comply with the LGPD (Brasil, 2018) (without any ethical or moral aspect beyond that) is far from the scope of Ethics.

3 Related Works

We can only talk about the development of information technology by citing the Web's appearance and how it has enabled a new way of communication. Its continuous and rapid technological development has impacted how people interact, execute their daily activities and do business. Despite its social-technical impact, the concern with ethics in Web environments (and the use of different media) has been broad in scope but shallow in actions and studies.

Recently, the W3C created the TAG Ethical Web Principles [4], a draft of the Technical Architecture Group without any normative content. It is a set of 12 directions to raise awareness of the ethical responsibilities of web makers. To discuss ethics in technologies and applications development, we have to analyze its impact on how people interact, directly and indirectly, and the consequences of this interaction. Because of the bias in data or algorithms, some solutions can discriminate based on race, age, and gender, among others. Prominent social recommendation algorithms can exacerbate the under-representation of certain demographic groups at the top of the social hierarchy (Stoica et al., 2018). While job recommendation algorithms can help workers and firms find matches faster, they may reinforce gender and other stereotypes (Chaturvedi et al., 2021; Gaucher et al., 2011). Some words in textual content and their widespread use can bring marginalization and socially-constructed low representation to women (Dacon and Liu, 2021; Bolukbasi et al., 2016).

We also perceive phenomena beyond discrimination or prejudice, such as the filter bubble effect (Pariser, 2011), separating users from information that disagrees with their viewpoints, effectively isolating them in their own cultural or ideological bubbles. Consequently, people consume and share information without encountering opposing views, potentially resulting in an unintended exercise of confirmation bias. This effect can create Echo chambers, referring to situations in which beliefs are amplified or reinforced by communication and repetition inside a closed system and insulated from rebuttal (Barberá et al., 2015). Echo chambers may increase social and political polarization and extremism (Cinelli et al., 2021). It has global effects, affecting democracy (Bond et al., 2012; Hargreaves et al., 2020) and health (Lin et al., 2014). Also, the platforms commonly try to exempt themselves when some problems appear (Helmore, 2020).

3.1 Related scientific spaces

Ideally, the Web was initially intended to empower and promote an equitable, informed, and interconnected society. We need to include ethics when we build web solutions. We can see CE as an exciting topic or unique event track from the academic-scientific side. It is an ongoing talk involving government, academia, society, and enterprises. In other scientific communities, the communications should describe the authors' ethical challenges in their work. In 2018, the community created the FAT* Conference to discuss fairness, accountability, and transparency in web-based technologies in a multidisciplinary way. This conference condenses prior workshops like FAT/ML (machine learning), FAT/Rec (recommender systems), Ethics in NLP (natural language processing), and others. In 2019 it changed its name to ACM FAccT immediately following the 2020 conference, being one of the most cited conferences in the area. ACM FAccT [5] brings ethical discussions to the Computer Science scientific community. As such, it can impact Web and Multimedia research, helping to understand problems and consequences, training responsible professionals, informing society about existing risks, and demanding government actions.

4 Research Method

This section presents the SLR protocol used to collect, select, and summarize relevant research steps, aiming for auditability and reproducibility. We followed the guidelines

[4] `https://www.w3.org/2001/tag/doc/ethical-web-principles/` [accessed 08-08-2023]

[5] `https://facctconference.org` [accessed 08-08-2023]

Table 1. Research sub-questions and possible answers

ID	Questions	Answers
RQ1	What technological domains are involved?	Open answer. Technological domains are research dependent
RQ2	Do the occurrences of ethics refer to ethics in the research epistemology, application, or both?	Episteme, Application, Both
RQ3	How ethics committees and informed consent occurs?	Interpretative. About Ethics Committee and Informed Consent Form/Term
RQ4	Which research institutes or universities in the country stood out in ethics-related research?	Research institutions/universities
RQ5	What is the methodological research approach?	Quantitative, Qualitative, Pragmatic, or Literature Review
RQ6	What ethical principles or foundations are covered?	Open answer. Ethical principle or foundations
RQ7	What are the main limitations and difficulties explicitly associated with the ethical aspect?	Interpretative. Cited limitations and difficulties
RQ8	What is the research application environment?	Open answer. Where the research took place

by Kitchenham (2004); Kitchenham and Charters (2007) to conduct a comprehensive, reproducible, and accurate SLR. We employed the *Google Sheets* online service to allow remote operation, cooperation, and monitoring from a shared database.

We applied well-established principles to identify and analyze various ethical aspects. Covering sixteen of the event's twenty-seven editions, we analyzed the papers published in WebMedia between 2005 and 2022, except 2007, chosen for their availability in the ACM Digital Library (ACM DL). We also analyze the extended proceedings at SBC Open Library (SOL), valuing completeness and primary scope. Thirteen editions are available between 2010 and 2022, featuring workshop and poster content. As a result, we created an overview of the occurrence of ethical aspects in WebMedia publications in this period.

Following the rationale in the result of similar works, we refrained from covering all years, proceedings, and editions, as in Carvalho et al. (2022b, 2021c). Until 2014 the number of superficial occurrences in each year was a maximum of two publications, with no adherent occurrence. As the years decrease, the number of occurrences decreases, as shown in Table 3. Considering the regressive trend, the time and effort to obtain and analyze the complete proceedings are disproportionate to the potential expected result and disadvantageous in cost-benefit.

Table 1 presents the research questions guiding the SLR. These questions balance data and information about ethical or moral aspects of Computing and Ethics, aiming at the best qualitative synthesis of knowledge. The answers comprise the broad panorama of ethical or moral aspects in Web, Multimedia, or Hypermedia research in the most significant Brazilian event dedicated to these topics. The absence of some of these data significantly impairs derived analyses. For example, considering RQ1, RQ4, and RQ8 and the absence of adherence, technological domains, institutions or specialists, and contexts of application are null, which is critical *per se* and terminates the analysis. If adherent occurrences are absent, the RQs are useless without elements suitable for extraction, and a discussion occurs about this absence phenomenon.

The search strings focused on retrieving studies explicitly related to ethical aspects. We searched for explicit elements associated with Ethics. We configured the open terms to capture morphological variations. In English, we search for "ethic", e.g., ethics, ethical; in Brazilian Portuguese, "etic", e.g., *eticamente, ético, ética*. We search for the homonym considering moral, equal in English, e.g., morally, or Brazilian Portuguese, e.g., *moralmente*, including *morais* (plural).

We also consider IC and EC as intrinsic elements of Research Ethics, although secondary (Brown et al., 2016). When exposed, they indicate a direct concern with research ethical aspects. Considering EC, we include the results of the string search associated with ethics, as the official term is **ethics** committee. [6]

IC is a particular case. Because several scientific communications use different terms to indicate that "human participants, as holders, have authorized the use of their data in the respective research" (Carvalho et al., 2022b). We only encompass consent, the official term (Brasil, 2012, 2016), formally found as a term or form. We search for "consent" considering both English, e.g., consent, consent term, consent form; and Brazilian Portuguese, e.g., *consentido, consentiu, termo de consentimento, formulário de consentimento*.

Each stage's search terms, exclusion, and inclusion criteria are structured in Table 2.

The wide screening step involves the search process (Kitchenham, 2004), which is objective and structured by previous criteria. This step resulted in 52 papers (≈3%). Two independent researchers analyzed the search strings in all papers. They separate papers with objective and explicit occurrences of these terms. One researcher conducted the objective search, and the other reviewed the results, aiming at impartiality and correctness. The result exposes a broad view of the papers' quantitative status regarding the target ethical aspects.

In the narrow screening, we selected papers presenting ethical aspects and associations. An analysis of ethical aspects evaluates whether the research reported in the papers adheres to the concepts and criteria discussed in Section 2. At this stage, quantity is negligible, and the quality of the occurrence is decisive. It is important to note that, unlike the previous search process, the "study selection" and "quality assessment" are subjective and vary according to the SLR, theme, and interpretation of the researchers conducting the

[6]Social institutions equivalent to EC in other countries use other terminologies, e.g., in the USA, the nomenclature of Institutional Review Board (IRB) is common. `https://en.wikipedia.org/wiki/Institutional_review_board` [accessed 08-08-2023]

Table 2. Search string, exclusion and inclusion criterion

Search string	"ethic" OR "etic" OR "étic" OR "moral" OR "morais" OR "consent"
Wide screening exclusion criteria	- Does not mention ethical-based terms directly associated with the search string - Does not mention informed consent or ethical committee - Ethical-based terms occurs only in references, abstract, direct citations/quotes, title(s), or keywords
Wide screening inclusion criteria	- Mention ethical-based terms directly associated with the search string - Mention informed consent or ethical committee - Ethical-based terms occurs in body-text
Narrow screening exclusion criteria	- Ethical-based terms are mentioned superficially - Ethical aspects do not adhere to the definitions considered in this paper
Narrow screening inclusion criteria	- Ethical-based terms are mentioned in-depth and broadly considered - Ethical aspects adhere to the definitions considered in this paper

review (Kitchenham, 2004). We analyzed the ethical aspects of the 52 papers extracted, aiming for a selection and quality consensus at the stage of qualitative synthesis. We reached a consensus resulting in one paper (Oliveira, 2020). Regarding reproducibility, auditability, and openness, the screening database is available online [7].

We follow the reasoning of other SLRs based on Ethics, such as Bock et al. (2021), considering the complex construct with various applications. The terms indicate that the presence of content is not necessarily objective and directly associated. If we anchored the terms to the questions, (i) or we would have, at the best scenario, one or two results in the wide screening; (ii) or a not plausible communication with the computing domain, i.e., it would be an Ethics aligned communication, instead of Computing. Related works on CE have this "loose" aspect between Ethics and Computing.

Figure 1 depicts the selection process and results. From a total of 1331 papers initially retrieved, we included 52 papers after the wide screening. After evaluation, one was read in full (Oliveira, 2020) and included for further consideration, but not qualitative synthesis. Unlike previous works (Carvalho et al., 2022b,a, 2021c), this was the first time that we disregarded a publication selected in narrow screening for qualitative synthesis. We followed the protocol faithfully, considering exclusion and inclusion criteria, without predicting that a publication could be an "invited-talk". Therefore, we could not answer the research questions through a two-page document.

5 Results

Wide screening results depict a broad view of the ethical aspects identified in the publications. Narrow screening evaluates their eligibility for qualitative synthesis with relevance, adherence, and elemental analysis of these ethical aspects.

5.1 Wide screening

The results of the wide screening stage, as illustrated in Figure 1, expose a quantitative view of ethical aspects in WebMedia publications between 2005 and 2022 (except 2007). A baseline overview of this data is structured in Table 3, considering it valuable to the WebMedia community.

The edition with the highest proportional occurrence was in 2022, 11.4% of 79. We expected at least one of the years with the highest absolute quantity to register the highest occurrence (2013, 2017, and 2019), which did not occur.

Another data behavior, dissonant from the results of previous works (Carvalho et al., 2022b,a, 2021c), was the expressive decrease in the results of the last editions, 2020 and 2021. The trend pointed to a slight increase or variance, different from between 2019 (5.1%) and 2020 (2.3%), and persistence in the lowest result in 2021. Reinforcing the inconstancy, 2022 jumps to the year with the highest proportional occurrence of ethical aspects – an unforeseen result considering the increase of epistemological variance of research in WebMedia, discussed in Section 6.4.

Figures 2 and 3 graphically represent the behavior of the data in Table 3 across the years. The number of occurrences is significantly small compared to the maximums, so there is low syntactic variance between them. Despite an insignificant difference, an absolute analysis suggests that the 2015 occurrences were lower compared to 2017 and 2019; proportionally, 2015 has more ethical aspects occurrences compared to 2017, 2018, and 2019.

5.1.1 Ethics Committee and Informed Consent

The number of EC/IC occurrences is alarming and inadequate compared to the amount of research with human participants. In a year with 140 publications (2017), it is unlikely that only 3 involve human participation and, therefore, involve EC. Worse, the occurrences of IC are also very low. We discuss this analysis in Section 6.1.

On IC/EC involvement, we conducted a review and categorization of the 52 adherent papers (≈3%):

- 13 papers (25%) do not present involvement or participation of human beings and do not mention IC/EC, which in institutionally morally adequate;
- 39 papers (75%) present the involvement or participation of human beings, excluding the paper authors. Of these:
  - 6 papers (≈15%) presents EC and IC;

[7] `https://4658.short.gy/WebMedia2022` [accessed 08-08-2023]

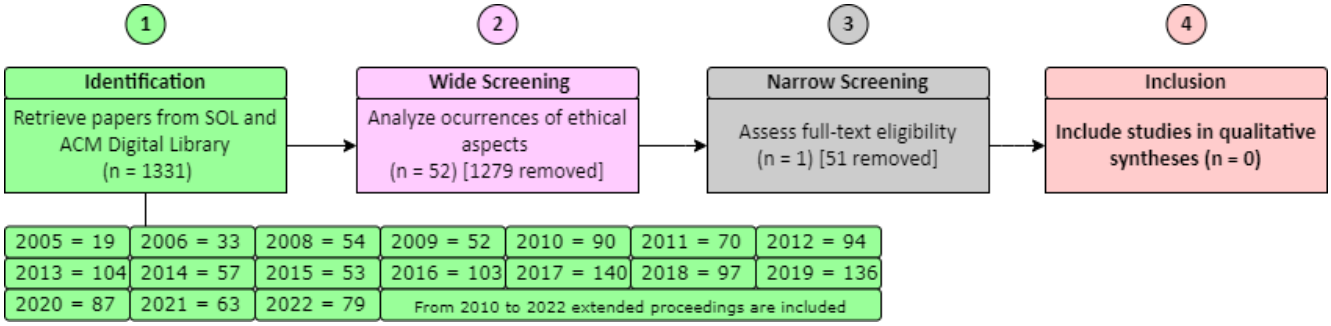


Figure 1. Diagram of the literature review process.

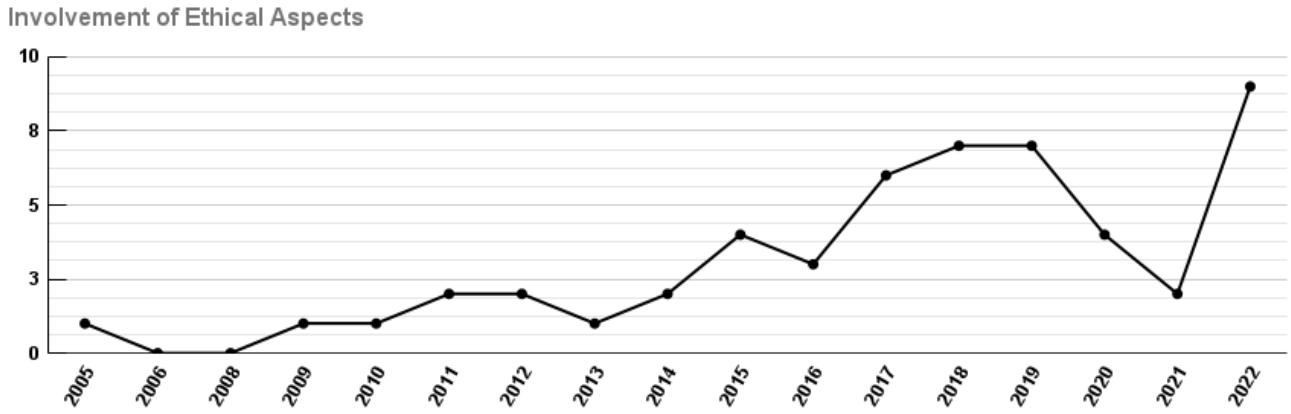


Figure 2. Ethical aspects occurrence, absolute.

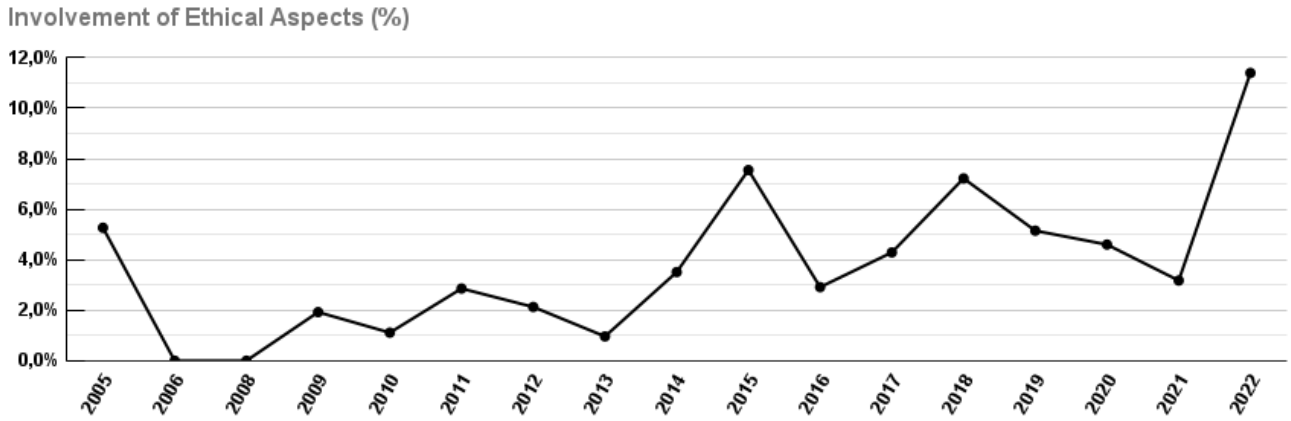


Figure 3. Ethical aspects occurrence, proportional.

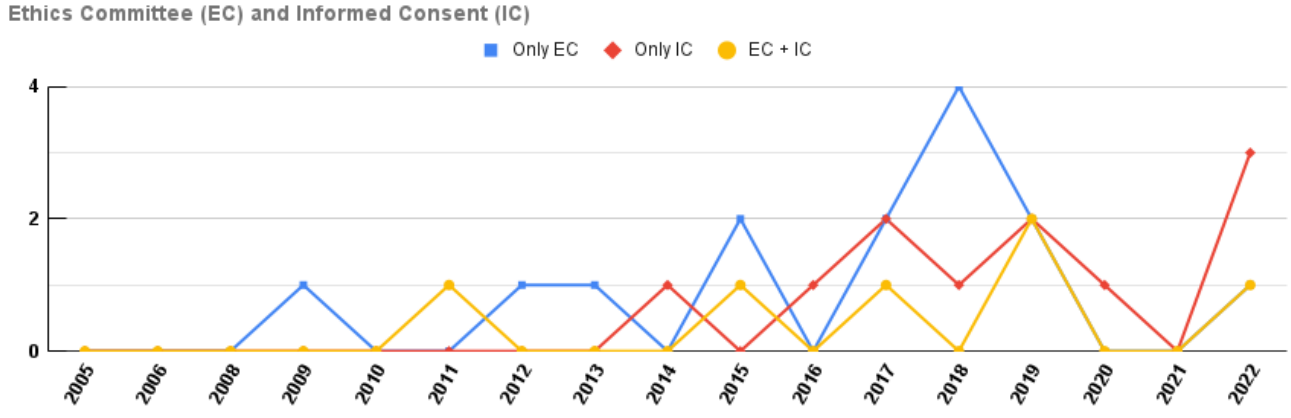


Figure 4. Ethical Committee and Informed Consent occurrence, per year.

Table 3. Wide screening results

Year (20-)	05	06	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	T.	T.(%)
Total (T)	19	33	54	52	90	70	94	104	57	53	103	140	97	136	87	63	79	1331	100
IC	0	0	0	1	0	0	1	1	0	2	0	2	4	2	0	0	1	14	1,05
EC	0	0	0	0	0	0	0	0	1	0	1	2	1	2	1	0	3	11	0,83
IC + EC	0	0	0	0	0	1	0	0	0	1	0	1	0	2	0	0	1	6	0,45
A.	1	0	0	1	1	2	2	1	2	4	3	6	7	7	3	2	9	51	3,83
Not A.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0,08
A. or not	1	0	0	1	1	2	2	1	2	4	3	6	7	7	4	2	9	52	3,91
A. (%)	5,3	0,0	0,0	1,9	1,1	2,9	2,1	1,0	3,5	7,5	2,9	4,3	7,2	5,1	3,4	3,2	11,4		
Not A. (%)	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	1,1	0,0	0,0		
A. or not (%)	5,3	0,0	0,0	1,9	1,1	2,9	2,1	1,0	3,5	7,5	2,9	4,3	7,2	5,1	4,6	3,2	11,4		

EC: Ethics Committee. IC: Informed Consent. A.: Adhere.

– 11 papers (≈29%) presents only EC;
– 14 papers (≈36%) presents only IC;
– 8 papers (≈20%) do not present EC or IC.

When dealing with EC, we involve the cases in which the authors indicated meta-scientific research involvement with some EC. Encompasses the state of research only submitted to some EC; submitted and under-appreciation; appreciated and approved; or approved and presenting the Certificate of Presentation of Ethical Appreciation (*Certificado de Apresentação de Apreciação Ética* – CAAE). It is common to find many EC states (Carvalho et al., 2022b). Research submitted in any state prior to the actual approval is morally questionable. Without approval, how can you guarantee ethical appreciation by the EC? Furthermore, without the EC's ethical appreciation and approval, what good is that information besides empty good deontological intention?

When dealing with IC, the scenario is more chaotic compared to EC. This phenomenon of chaos is not restricted to WebMedia (Carvalho et al., 2022b). IC is one of the essential and primary elements of Research Ethics (Salganik, 2017; Bos, 2020; Recker, 2021). It is the basis of a moral agreement between researchers and the humans involved, regardless of their degree or level of involvement. IC can occur in many different ways through scientific communications, from mentioning verbal and informal authorization from those involved to signing Terms of Free and Informed Consent (*Termos de Consentimento Livre e Esclarecido* – TCLE) and distributing copies of it.

An EC research project approval must expose its TCLE objectively and formally, indicating IC's involvement. We can indirectly assume that IC is involved if EC approval is present. Our focus is on the presence and involvement of IC, not necessarily TCLE. TCLE is an object of institutional objective moral norms and rules required by the EC system (Brasil, 2012, 2016).

Morally and ideally, IC is present, and its quality requirements are adequate (e.g., intelligibility). Institutionally, morally, and ideally, TCLE is present, and its quality requirements are adequate (e.g., present correct grammar). The worst case scenario is the absence of any IC or the quality requirements are inadequate. We noticed eight papers with human participation or involvement without mentioning IC.

Going deeper into the papers involving EC (without IC), we notice discrepant behaviors. Three indicate that they submitted their research projects to the EC; four objectively expose the CAAE; one indicates that the research project was approved by the EC, without CAAE; one objectively states an *parecer* [8]. In two, the wording was confusing. We could not stipulate the situation, even mentioning and involving EC.

The "opinion" is commonly assigned by a specific institution other than a EC related to the CONEP system, e.g., the EC of a hospital. In this work, we discard value judgments concerning CAAE or "opinion", as if one were right and the other wrong, one good and the other bad.

Going deeper into the papers involving IC only, we notice more discrepant behaviors. They obtained the IC in the following ways: five informally, without a term or detailed documentation; seven through a consent term; two through the TCLE. Of all fourteen, only two announce a morally ideal IC involvement. Reis et al. (2017) made the consent term available online through an electronic address in the paper. However, it requests authorization for external document access.

Going deeper into the papers involving IC and EC reiterate our discrepancy perception. Only two papers (Viel et al., 2019; Funes and Goularte, 2016) reach the ideal institutional moral explicit behavior of Research Ethics (Brasil, 2012, 2016), announcing the involvement of CAAE and TCLE. All the other four show different behaviors. In combinations of consent term + unknown EC involvement situation; consent term + CAAE; TCLE + approved by EC (in CAAE); TCLE + planning EC submission (not submitted yet).

Furthermore, we can not ensure the quality requirements even if both elements are present. Even so, there is a complex gray zone between ignoring or totally neglecting IC and EC and explicitly and objectively exposing the involvement of the two with (TCLE and CAAE). However, categorically, being in this gray zone is better, by the parameters of Research Ethics, than outright ignorance or negligence.

[8]The same phenomena occurs in Carvalho et al. (2022b): "There is no English accurate translation, in Brazilian Portuguese, they use the term *parecer*, indicating that the proposal was appreciated and received something like a 'visa', which is not a CAAE."

5.2 Narrow screening

We had a publication Oliveira (2020) considered adherent by the complete screening and consensus of all authors. As a summary of the author's lecture, its two-page length presents a scarcity of data or information relevant to a detailed appreciation. Therefore, it was considered adherent by ethical or moral aspects but limited to in-depth extraction. Given its relevance, we briefly discuss its contributions and tensions in Section 5.2.1.

We noticed a promising potential for adherence in several publications, whether applied or meta-scientific. Even presenting the appropriate search terms (Table 2), the quality of occurrence of ethical or moral aspects linked to them were superficial, brief, summarized or, in some cases, erroneous or confusing [9]. Despite the objective character we aim for in this research, we also aim to avoid losses, damages, or setbacks to those involved in the analyzed works. We will briefly present some examples.

da Silva and Cordeiro (2016) proposes the game Human-Quiz, with an educational and informative character and points out that playing favors moral development. Indeed, this is a well-established perception in the Games domain (Carvalho et al., 2023), but how does Human-Quiz accomplish this moral development? What moral development does it advance? What would be moral development in this specific case?

Yagui and Vivacqua (2019) announces that "In domains involving ethical issues, such as the case of ICH of medicinal plants, only plants that have curative active principles duly proven by science should be published to the community." [our translation]. What are these ethical issues? Why is this an ethical issue? What are the positive or negative aspects of this perspective?

Júnior et al. (2022) performs an extraction of terms in social media, including terms considered "*baixo calão*" [sic] (bad language). Images are presented with these terms, some of which are replaced by the term "*censurado*" [sic] (censored). The authors indicate carrying out this adaptation for ethical reasons. What reasons? As a scientific communication that values the validity and integrity of results, what ethical reasoning culminated in this censorship? Who does this censorship benefit, or what harm can it prevent? What is the negative aspect of this censorship?

5.2.1 *Let's talk about the role and impact of social computing in our lives*

The title of the publication selected by narrow screening but not included for RQ answering is an ethical and moral appeal. It invites the community to talk about the role and impacts of Social Computing, as Oliveira (2020) announces: "[...] *the dissemination of disinformation and biased information can cause physical, financial, moral damages, affect basic civil-rights, and also bring panic to the population and cause emergency situations.*" (Oliveira, 2020). During the wide screening, we found publications involving these problems without addressing them from an ethical perspective.

Talking about the role and impacts of Social Computing involves talking directly or indirectly about ethics or morals. At least in 2021, this calling did not have much effect, as we perceive in Table 3. Even so, it is up to date regarding the moral concerns of the Web and Multimedia also present in the CE literature (Kizza, 2016; Baase and Henry, 2017; Blundell, 2021), in Berners-Lee's open letter (Tim Berners-Lee, 2019) and in the legislative debate [10] — for example, transparency, filter bubbles, echo chambers, bias, and users' addiction.

Bringing ethics into the debate can present plural views and heat the discussion. As the author says, "*Can human behavior be modeled, simulated, and predicted? What precautions do users need to take?*", but more than that, should we manipulate human behavior? When is it allowed to deal with this construct? If this alleged manipulation steers in a direction perceived by morality as "good" (e.g., inducing a person to eat healthier), is it permissible? Should users take precautions, or should regulatory organizations stipulate norms to mitigate the users' precautions?

Analyzing the result of this SLR, realizing the deficiency of ethical aspects in the determined interval, and considering the problems already widely exposed here, should we be concerned with correcting or improving what we already have? Should we focus only on the impacts and consequences in Brazil, leaving the idea of "solving the globalized problem and the supposed generalized phenomenon" in second place? Should we maintain the technological solutionism trend and continue forwarding new interventions and computational solutions? Is it too late to talk about it if we are already full steam ahead? Even worse, will just "talking about" generate concrete results? Will we have a new version of this talk in 2030, inviting us to talk about the roles and impacts of social computing from 2020 onward?

6 Discussion

We discuss the absence of publications adhering to the qualitative synthesis, inspect information on different perceived ethical aspects, highlight points appearing on EC radars, and enrich the debate on Web and Multimedia.

6.1 The Informed Consent/Ethics Committee vacuum

We delve into the small number of occurrences related to EC/IC Table 3), since the EC involvement is an institutionally mandatory component for research involving human participants (Brasil, 2012, 2016). The result was more surprising since we found more EC occurrences than IC. Developing an IC requires less effort than submitting a project to an EC.

[9] In this case we will refrain from indicating which ones present these negative qualifications, due to our moral judgment and conscience. Furthermore, it is outside our scope. Even so, indicating the presence of this category of occurrences is relevant.

[10] `https://www25.senado.leg.br/web/atividade/materias/-/materia/141944` [accessed 08-08-2023]

6.1.1 Ethics Committee

We identified publications involving human participants without EC involvement, which goes against the institutional morality of Brazilian Research Ethics. A few examples are the work by Lima et al. (2019); Brito et al. (2019); Arantes et al. (2018); Reis et al. (2017).

Machado et al. (2016) reported the project submission to *Plataforma Brasil* [11], reported waiting for the result before further research. Neto et al. (2015) included the submission of the research to the EC as the next step of their research, contemplating the step in which human participants would be involved.

Norms coming from the normative acts of the EC system prevents participants from being rewarded or remunerated. Brito et al. (2019), and Arantes et al. (2018) indicate that participants did not receive any compensation when participating in the research and reinforce obtaining consent from those involved. Arantes et al. (2018) go even further and presents another EC normative forward, clarifying that participants could choose to interrupt their participation at any time without any consequences. These two occurrences are unusual as they do not report project submissions or feature any reference to EC. Not even to the official norms (Brasil, 2012, 2016)

Melo et al. (2021) state: "[...] *Finally, our studies on WhatsApp were approved by the ethics committees of MIT and the Max Planck Institute in partnership between our research group at UFMG and researchers from these universities.*" [our translation]. Brazilian research from Brazilian universities involving Brazilian human participants must be submitted, appreciated, and approved by a Brazilian EC. In the current regulations, there is no exception for registration or evaluation for research registered and evaluated by EC outside Brazil (Brasil, 2012, 2016). Different countries implement different moral and institutional norms for conducting ethical research. USA's EC uses their norms and morality, different from the Brazilian ones, to appreciate the research projects.

Many publications in the Theses, Dissertations and Scientific Initiation Works workshops or contests do not mention or involve EC/IC, or any moral or ethical aspect. This absence reflects the undervaluation of these elements in the corresponding research categories.

We analyzed the doctoral theses and master's dissertations of the 2022 edition of WebMedia to analyze the absence of ethical or moral aspects, mandatory by institutional ethics in research or not. The first three places in the doctoral theses competition, respectively, Freire and Goldschmidt (2022), Josué et al. (2022), Oliveira and Melo (2022). The first three places in the master's dissertations competition, Mendes and Colcher (2022), Silva and Durão (2022), Regino and Reis (2022).

In none of the six is there any mention of morals or ethics, or moral or ethical aspects are analyzed; IC and EC are equally absent. Any research, research practice, and research communication is subject to ethical or moral scrutiny, regardless of how much the researcher positions it as "technical" or "disconnected from human or social aspects". In the contest category for master's dissertations or doctoral theses, this is an arduous task. There is a space limitation of four pages imposed on the communication. Summarizing and synthesizing a knowledge artifact of dozens or hundreds of pages in four is a Herculean task (without moral judgment of this task). At the same time, omitting ethical or moral aspects is morally questionable, even if summarized in a brief sentence or paragraph, e.g., "in addition, I appreciate ethical or moral aspects in the research" or indicate EC involvement and approval. As a significantly abbreviated version, there is room for this simplified and brief communication resource, considering that these are researches oriented to other themes or topics far from ethics or morals.

We start with the doctoral theses. In the first position, Freire and Goldschmidt (2022) proposes a Machine Learning approach involving the behavior and a reputation scheme of users, configuring human involvement. Rather than drawing inferences about Fake News from the explicit opinions of users, it infers the implicit opinions from the behavior of users concerning the dissemination of information. The computational solution involves the users, their behavior (i.e., actions), and their "reputation".

In Freire and Goldschmidt (2022), we consider human involvement as passive. Although the person never agreed to participate or even became aware of the research existence, the person "will be participating anyway". This person's data in whatever digital media will be extracted, and following the research approach, their behavior will be analyzed and a reputation assigned. There is human involvement, however, in a morally gray area still little debated and formally standardized (Carvalho et al., 2021a).

Josué et al. (2022) explicitly indicates that there was an evaluation and that users were involved and mentions the results of the tests right after. Users' or participants' information needs to be clarified. Oliveira and Melo (2022) return to the morally gray area regarding user data and digital media. The same passive involvement returns. However, a variable complicates the potential ethical dilemma, the data from politicians. The latter set intensifies the ethical intricacies of this scenario, categorizing data as political or non-political.

Regarding master's dissertations, we discard a more detailed analysis of Mendes and Colcher (2022) and Regino and Reis (2022). These are heavily devoted to computational technical aspects, with little influence on moral judgments for a superficial analysis, as the in-depth analysis is beyond our scope.

Silva and Durão (2022) deals with the idea of justice in recommendations systems. Justice [12] it is an object of

[11] "The *Plataforma Brasil* is a national and unified database of research records involving human beings for the entire Ethics Committee/Conep system. It allows research to be monitored in its different stages – from submission to final approval by the Ethics Committee and Conep, when necessary – even allowing the field phase monitoring, the partial reports sending, and the final research reports (when concluded). The system also allows the presentation of documents in digital media, providing society access to public data on all approved research." [our translation] `https://plataformabrasil.saude.gov.br/login.jsf` [accessed 08-08-2023]

[12] Justice and Fairness are two closely related conceptual artifacts in algorithm-related literature. Therefore, we could not specify the term translation as one or the other. We will continue using "justice" as in the

very high value to ethics. Since Greece, Aristotle has gone deeper into this object, as a quality of the person and of a society (Marcondes, 2007; Pegoraro, 2013). As Silva and Durão (2022) announces and we reinforce this view, a line of thought about algorithmic justice is growing. Recommendation systems are ethically controversial (Sumpter, 2018; Blundell, 2021) computational solutions. We could have excluded (Silva and Durão, 2022) from the analysis, as the proposal focuses on technical aspects. Nevertheless, justice combined with recommendation systems is *epistemically* intertwined with ethics, however ethical or moral aspects are absent.

Silva and Durão (2022) are limited to technical aspects and keep the evaluation at a syntactic, quantitative, and technical verification level. They mention the bubble effect (Sumpter, 2018; Pariser, 2011), and discuss an example about music and musical styles, relatively innocuous and harmless compared to other morally controversial filter bubble cases:

> "A motivational example is, assuming that a user's profile is composed of 60% Rock, 20% Samba and 20% Mangue-Beat songs, so we have that the most preferred genre is Rock. Furthermore, we assume that the application has songs from the most different genres in its database, but that most of them belong to Rock. Thus, we have a tendency for the most popular songs to be from Rock and in addition we have that the user's own preference is composed of a majority of Rock. This causes a bubble effect [...], in which only one genre is popular and consistently recommended." [our translation] (Silva and Durão, 2022)

This motivation based on the bubble effect presents a semantic richness and a pragmatic and consequential void. So, is the bubble effect negative in this case? Should the profile be 100% Rock? Or is the predominance of Rock the real problem? Should the recommendation system go against the bubble effect and, for example, recommend more samba? Or reinforce the bubble effect and the user's subjective, aesthetic interests and push Rock to 100%? The routing reasoning is nebulous. The solution aims to improve calibration in recommendation systems and algorithms. How does this, in direct association, lead to algorithmic fairness? Or justice in general?

That said, in a brief analysis of papers awarded on WebMedia in 2022, we notice a significant potential for the manifestation of ethical or moral aspects. Concomitantly, we perceive the absence of IC or CE when it was necessary or, if morally dubious, highly recommended.

The problems in the contest and workshop are different. In the contests, the possibility to select, as eligible for an award, research involving human participants without reporting the involvement of any EC/IC is worrying. In the workshop, the main concern is to report research of this magnitude involving human participants without any EC/IC involvement.

We perceive two rationally plausible diametric ethical arguments. First, there is a severe space limitation in these publications, so it is morally acceptable that ethical or moral aspects are absent. Second, ethical or moral aspects are crucial and essential in any research, especially when considering a thesis or dissertation, which is why it is morally imperative that these elements are present and, more than that, in their section.

Although both options above are valid, we argue for middle terms. Considering the high value that EC and IC have for Research Ethics, if there is human involvement or participation, these must appear in the text, even if in brief and summarized sentences, e.g., "[...] this research was approved by EC under CAAE <CAAE number>, obtaining the IC through a specific term for this purpose".

On the other hand, the absence and subsequent award of a research communication that omits IC or EC, when applicable, is morally questionable and leads to an exemplary negative scenario Zagzebski (2017). Ideally, it would be a moral advance if the publications presented respective ethical or moral aspects; however, given the space restriction, limiting it to highly valued elements already indicates a positive differential.

6.1.2 Informed Consent

IC is a crucial case, as the ethical foundation of research involving human participants is consent (Salganik, 2017), enhanced by specific quality criteria (Brasil, 2012, 2016), e.g., use of clear and simple language for easy communication with the target audience. IC is one of the fundamental requirements stipulated by the regulations for project approval (Brasil, 2012, 2016), i.e., if the text indicates approval by an EC, then IC is involved. Some publications involving EC omit the IC involvement, e.g. (Mombach and Soares, 2020; Dias and Barbosa, 2019; Machado et al., 2016). EC-approved research projects in which there is research specificity that discards IC are rare.

Similar to Carvalho et al. (2022b), certain research publications with human participation do not mention or involve IC. When mentioned, the involvement of this element occurs in different ways, e.g., only announcing that participants have consented to participation without mentioning a term or form, or notifying that they have consented by signing a term. In some instances, obtaining consent is communicated without using the term "consent". Either through "authorization", "permission" or similar.

Additionally, if an EC approves a research project, the IC has been reviewed by the EC or exempted. Since IC is one of the essential elements of the consensus of scientific practice between researchers and human participants or involved Salganik (2017); Bos (2020), its structured and formal presentation is necessary for EC appreciation Brasil (2012, 2016). Reviewing IC documentation involvement and quality is an expected step for EC approval.

Deepening the IC/EC absence phenomenon in scientific communications is crucial. Omitting these elements is not a sufficient or necessary condition to say that the respective research omitted IC/EC practically and concretely. Research may have involved these elements, and the publication omitted them. However, for validity criteria, such as completeness, omitting IC/EC when the research involved these elements is a problem of objective scientific communication.

The event proceeding assembles the scientific culture

original.

and memory as scientific communication. One of the research communication foundations is detailing its methodological and methodical procedures, including ethical requirements (Recker, 2021). Therefore, although the absence of these elements in scientific communication is not conclusive for the moral qualification of the research, it is conclusive for the moral qualification of scientific communication.

6.2 The methodological crisis

One of the meta-science concerns is the research methods and methodologies analysis (Ioannidis et al., 2015; Ioannidis, 2018), composing the scientific epistemological evaluation. We cannot dwell on positive valuation and encouragement, a fundamental scientific premise (Recker, 2021; Ioannidis et al., 2015). One of the requirements for research to be considered academic or scientific is the involvement of procedural methods and methodologies. The absence, or poor quality, of a structured, formal, and epistemological well-founded procedure impairs the research quality, prevents its reproducibility and replication, and nullifies any guarantee of validation or conformity of the information or knowledge generated. Causes and consequences appear inseparable, disconnected, and deliberately manipulated.

In this sense, despite no adherence between the analyzed papers, we deepened this topic by combining meta-science, ethics, and academic-scientific quality. Is there an absence of research methods and methodology in WebMedia publications? For this: (i) we separated the three most recent years (2020, 2021, 2022); (ii) we selected only one among these years (2020, 2021, 2022); (iii) conducted a systematic and structured search on the respective main track of the selected year only [13].

After analyzing all the main track publications, only the systematic reviews or mapping of the literature (≈5% of all papers) showed rigor in their research method (Kitchenham, 2004; Kitchenham and Charters, 2007), without delving into the applied methodology. Of all the other papers, only one cited an effectively well-established methodology in the state-of-the-art of this topic, Design Science Research (DSR) (Recker, 2021; Wieringa, 2014; Creswell and Creswell, 2018). Several papers confused methodology, method, proposal, and approach, with sections presenting content dedicated to one of these themes, titled by another (e.g., the proposal in a section named methodology). No paper presented a scientific paradigmatic approach (Creswell and Creswell, 2018), e.g., qualitative, quantitative, mixed, pragmatic, interpretive, among others.

In more than 90% of papers and researches, the predominant scientific paradigm approach is pragmatic. Only a single paper presented DSR as a guide for their research. However, DSR has two perspectives, design and scientific research (Wieringa, 2014). In this work mentioned above, only the design perspective is considered, with no scientific investigation.

On the other hand, there is a rather curious generalized behavior. Excluding secondary research, all others present procedures or step-by-step, detailed or not, reproducible or not. We call them "procedures" because they are too rudimentary to be a method or methodology. What happens are *instantiated* informal and *ad hoc* methods, which are deeply scientifically deficient. Each procedure is "new" and different, even if intentions, objectives, or research proposals are similar.

As standard in most, there is one data collection, preprocessing, processing, analysis, and evaluation. In most cases, this assessment is a comparison. Each paper specifies the procedure for each research. What is missing is a "higher-level procedure" to serve as a guide, standard, or model for what would be a scientific epistemological method or methodology.

Therefore, there is a deficiency in what is traditionally understood and ideally perceived as "science" and "scientific" (Bos, 2020) in knowledge engineering on WebMedia, which positions itself as a scientific event. At this point, it is reasonable that we have aroused a specific moral conflict if you connect either with this type of knowledge engineering or with any of the traditional WebMedia publications and that you perceive this section as demoralizing or devaluing the analyzed publications.

We concatenated and analyzed the information in descriptive knowledge without value or moral judgment. There is knowledge engineering, information processing, community consensus on what is positively or negatively valued, i.e., the agency of these truths, and social and cultural acceptance. Even so, we perceive an explicit, objective, and direct epistemological scientific deficiency as the methods and methodologies are absent or deficient. The contributions and their respective values remain the same, even without traditional scientific values.

Even worse, most of the papers reviewed (again excluding systematic reviews and mappings) omit any references to scientific or research methods and methodologies. Only one publication uses the DSR and references its source. By default, they follow procedures disconnected from any formal methodological references, even if basic; they follow a section of related works that amends either directly the proposed artifact or, in a method pseudo-section (as already detailed above), that details the step-by-step of the operational practice of the research. Any high-level methods, detailed methodologies, or even proposed methods based on epistemology are absent. We did not find references to traditional books, articles, papers, or materials on research methodologies, methods, or procedures.

We can consider the argument that the *episteme* of scientific knowledge in WebMedia, or even Computing as a whole, is "separated from the rest" or even, as routinely perceived, "applied research". As a scientific event, this does not exempt research, or respective publications, from explicitly announcing their **research** methods or methodologies for knowledge engineering, their procedural epistemology. En, if the methods and methodologies applied in the research are restricted to the WebMedia community,

[13] After ethical scrutiny, we decided to both *anonymize* the year of analysis and the respective publications. The intention is to point out the methodological, epistemological deficiency as a phenomenon without generating losses, risks, or devaluation to the authors and their publications. We imply the moral conflict systemically in the phenomenon, far from a punctual individualism.

any such information is still missing.

Without adequate reference or citation, procedural standards, or methodological rigor, we perceive a phenomenon close to epistemological anarchism (Feyerabend, 2010). Moreover, again, without value or moral judgments, this is descriptive insight based on facts through data.

Considering specific perspectives of scientific rigor, this is a controversial and morally questionable phenomenon. For example, (Lakens, 2023) touts the idea of methodological review boards in research institutions (e.g., graduate programs). It adds positive value to this topic and raises the rigor of quality requirements in research methods and methodologies. What enables us to question whether research publications that explicitly and objectively omit their methodical or methodological references or foundations have less scientific value? As to be rejected in evaluations for this factor? Or are methodological references or foundations only aspects and subject to omission, and does the concrete, primarily pragmatic, contribution has greater value in comparison?

Concomitantly, the WebMedia community generates, agency, publishes, references, sustains, and socially accepts knowledge by and through the community, and rigorously "scientific" or not, is positively valued. This phenomenon is not exclusive to WebMedia but is also present in other academic-scientific spaces dedicated to computing in Brazil (Carvalho et al., 2022b, 2021c). Thus, after analyzing the meta-scientific nature with an ethical perspective in research practice, we noticed a profound deficiency and negligence in traditional scientific methods and methodologies.

6.3 Technical syntactic and semantic problems

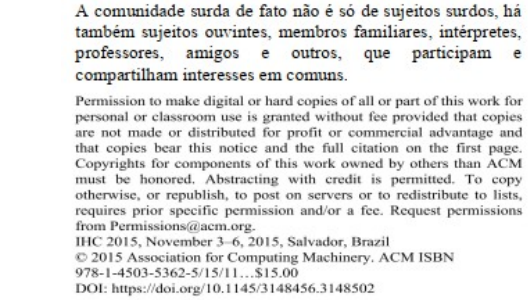
As previously announced in Section 1, other research initiatives similar to this one have occurred previously, covering other scientific communication spaces and knowledge epistemes in Computing. The first was the abbreviated version that preceded Carvalho et al. (2022b), Carvalho et al. (2021b). Already in this first SLR, which makes up a series of research including the summarized version of this present work (Carvalho et al., 2022c), we found an unusual and curious problem as it occurred in Computing: broken characters. I, the first author, would like to tell a story about this problem, and the WebMedia space is suitable for this tale.

When we started the first instance of the first research of the first SLR of the first search, the protocol was as follows: we institutionally accessed the proceedings, downloaded all the publications selected for analysis, and organized and structured them into folders; where data collection and preprocessing takes place. From this point onward, what we call wide screening in the method and Figure 1 begins. We realize the problem in this step.

Using a computational system specialized in documents with PDF extension, we broadly searched all the files in the folders. Everything was going perfectly well, as we ideally initially hoped. Informally, we believed almost blindly in the technical and practical-utilitarian credibility of the entire traditional scheme of repositories and paper publications, considering that the ACM DL and the committee members responsible for the publications would not make mistakes or commit simple slips. The screening by terms occurs in pairs, the first researcher searches for the terms and the second validates, then the second researcher searches for the same terms, and the first validates — a trivial procedure to ensure quality and mitigate threats to validity (Kitchenham and Charters, 2007; Petersen et al., 2015).

At a certain point, analyzing the publications manually in a dynamic reading, we noticed something unusual, a lost "*ética*". It did not make sense because we searched for "étic" to cover *ética* (feminine inflection) and *ético* (masculine inflection) [14]. The computational solution explicitly indicated the absence.

All short papers from the 2015 IHC proceedings present character encoding problems. For example, in Cardoso et al. (2015), in the excerpt: "The deaf community is not just made up of deaf people, there are also hearing people, family members, interpreters, teachers, friends and others who participate and share common interests." [our translation] (Cardoso et al., 2015). Figure 5 graphically displays a screenshot of the same sentence.



A comunidade surda de fato não é só de sujeitos surdos, há também sujeitos ouvintes, membros familiares, intérpretes, professores, amigos e outros, que participam e compartilham interesses em comuns.

IHC 2015, November 3–6, 2015, Salvador, Brazil

978-1-4503-5362-5/15/11…$15.00
DOI: https://doi.org/10.1145/3148456.3148502

Figure 5. Characters as seen visually in the paper.

However, when copied and pasted, the result was (literally) depicted in Figure 6.

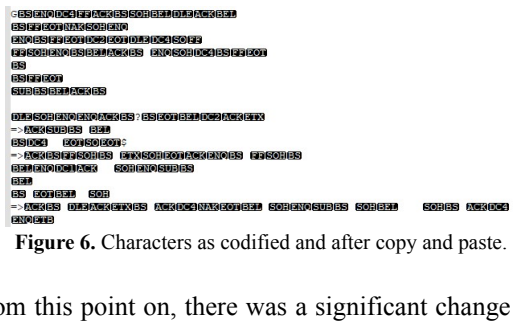


Figure 6. Characters as codified and after copy and paste.

From this point on, there was a significant change in the SLR protocol. Either we would choose to cover only material with correctly coded characters or hunt down all terms, even with wrongly coded characters. We follow the second option without a sound justification for the first, also to effectively criticize this phenomenon.

We noticed a broken scenario once we ended the IHC-related SLR. We found some character encoding errors or technical syntactic errors in the proceedings analyzed later.

[14] In English, both are translated as "ethics", in Brazilian Portuguese it needs a separation of terms and searches.

This phenomenon of erroneously coded characters occurs mainly in Brazilian Portuguese materials containing accents. For example, the first character of *ética* (é) is unrecognizable to search engines and automated readers.

It is not limited to the term *ética*, covering all other accented terms or even the character "ç", such as "*transparência*" (transparency), "*programação*" (programming), "*método*" (method), among many, many others; configuring a character encoding problem [15], limiting the character repertoire to the ASCII (American Standard Code for Information Interchange) table. In the ASCII table, the accents and the character "ç", essential for communication in Brazilian Portuguese, are missing.

Several communication spaces allow the use of systems such as Microsoft Word or LaTeX (we produce this article in LaTeX, using the computer system Overleaf [16]). To complicate the scenario, we cannot trace, with reverse engineering and logic, the causes of this coding problem. If we could objectively pinpoint the cause culminating in consequence of erroneously coded characters, we could propose solutions and improvements in this regard. Thus, this is a proposal for future work.

From here, we will analyze two elements: the broken characters' problematic consequences and accountability and their relationship with ethics.

One of the main objectives of publishing and broadcasting an academic-scientific communication, e.g., a paper; is to expose the research externally to the maximum possible target or potential audience. For example, when publishing a paper in Brazilian Portuguese, it is implicitly said that this communication primarily and directly aims at a Brazilian Portuguese literate audience. Logically, it is improbable that a Chinese academic-scientist will read it as originally made available.

On the other hand, there is a materialist and morally questionable perspective, disconnected from the social and cultural values expected from virtuous scientific practice (Bos, 2020; London, 2022). Publish and disseminate an academic-scientific communication, e.g., a paper; compose a resume and score in professional qualification ranks, or fulfilling specific student institutional needs (e.g., to advance some stage of the academic path, it is necessary to publish). The primary and direct focus is towards a selfish perspective, rather than the communist perspective from traditional scientific values (London, 2022). Exemplifying in the Brazilian context, "screw the scientific quality or what will happen after it is published, what matters is QUALIS for my curriculum" [17].

In a communion between the idealist and materialist perspectives of values and reiterating our commitment to ethics, there is room for these interpretations to coexist with prudence and parsimony. Aiming at ideals and virtues associated with the traditional scientific values of communism and advancement, preserving the material interests of the researcher, which is part of a dynamic in which the researcher has little influence or the power to change. The researcher is a product of the structural dynamics of his time.

We present this lucubration to point out that from the material perspective, this problem is negligible, the material has been published, and the researcher can add it to the curriculum, using this new arrangement of reality to his advantage. The research, and its content, are "invisible" from most searches for terms, automated or semi-automated. From an idealist perspective, it is catastrophic.

As a concrete example, we, the authors of this text, want this research's contribution, results, and knowledge to be available and accessible to the maximum possible and potential audience. Although this publication is in English, there is a plural occurrence of the term "*ética*" in Brazilian Portuguese and ethics in English.

Assuming that other researchers are interested in the term "*ética*" present here and if this work presents character encoding problems, these researchers' automated or semi-automated search will ignore this work. Manual approaches are absurd in these cases because the volume of material is relatively disproportional. Furthermore, this is a negative consequence for scientific practice, as literature reviews and mappings occur in an automated or semi-automated way, like in this work.

So if this work has the wrong character encoding and another researcher is interested in dealing with "*ética*", *lato sensu*, in the Hypermedia, Multimedia, and Web scenario in the Brazilian context, this research will be discarded, even if it has a direct association.

This situation is significantly harmful regarding factors that stem from the impact of publications.

Why so problematic? Because it happens since the 2000s in many materials, and it continues into the 2020s. We could think of plausible technical justifications if we were in a domain other than Computing. However, we are allegedly experts on this exact type of problem, so how has this technical problem persisted for decades? Furthermore, this is where we look at accountability.

Accountability is one of the essential components of ethics (Vázquez, 2018). We can rule out ethical deliberation without responsibility or accountability. In this case, there is a chain of responsibilities to think about responsible and guilty. In this case, would it be the authors of the publication? Program committee members or event organizers? Are the repository systems responsible for the publication's technical quality?

The authors are most affected, considering the aforementioned scientific ideals and the damage to the subsequent impact of publications access. If authors are ignorant about characters and encoding, they will analyze their publication and visually perceive it as adequate and valid. Even if "behind" the characters are encoded wrongly. In this sense, it is a case of ignorance at the individual or group (albeit a small one) level.

At the program committee or event organizer level, it is a less harmful problem. On the other hand, the responsibility regarding publication quality is the primary burden of this entity, e.g., correct references, structural problems, and adequate metadata, among others. Suppose the publication went through the organization and organizers, e.g., the

[15] `https://en.wikipedia.org/wiki/Character_encoding` [accessed 08-08-2023]

[16] `https://www.overleaf.com` [accessed 08-08-2023]

[17] `https://en.wikipedia.org/wiki/Qualis_(CAPES)` [accessed 08-08-2023]

program committee, and went to the repository systems without syntax checking. In that case, it is the responsibility of these organizers as well.

The problem of ignorance regarding the characters is in the individual sphere while associated with the authors; when it comes to organizers, the problem is systemic. They can mitigate this problem by warning in the events call for papers, recommending that authors conduct technical syntactic revisions in their submissions.

Repository systems present another variable in this system. They are paid for it, e.g., ACM DL or Springer. The situation worsens when they are paid per publication, unitary, and we perceive the absence of care with technical aspects, such as character coding. For repository systems and their organizations, this is a harmless problem within their contractual and operational limitations, e.g., the quality of what is stored is the responsibility of external entities, not the organizations that own the repository systems.

Another perception, although unusual and disconnected from a concrete logical path, would involve the publication production systems, e.g., Microsoft Word or LaTeX editors. If they generate the final publication files, part of the responsibility involves them. If we analyze the accountability component, it is illogical. Because these entities' loss, benefit, and risk factors are negligible; disconnected from verifying or validating what their users generate. Even if implementing the requirements that prevent this problem is a positive differential, it is beyond their proposals and intentions.

A threat to the internal validity concerning a technical aspect is the wrong character encoding of Brazilian Portuguese publications (Petersen et al., 2015), which also occurred in several previous works such as da Silva and Cordeiro (2016); Veríssimo et al. (2017); Maia and Silva (2017); Cunha and Pimentel (2016). To fully solve this problem, we had to download all publication files and adjust the search string accordingly. That is why we included the term "etic" in the search strings because there are several occurrences of *ética* or *ético* without an acute accent on the letter e, e.g., in Machado et al. (2016).

This character encoding problem is critical at the level of significantly impairing the results of Brazilian Portuguese research. Regarding WebMedia and Hypermedia, this is the proper community to discuss this problem. We found some publications with the encoding fully compromised, such as Machado and Ferraz (2005); Rivolli et al. (2011), i.e., utterly unreadable by other algorithms. With the wrong coding, general searches will not return these publications, limiting their impact factor, access, and visibility. Simultaneously, it harms the scientific culture, curation, and memory brokered by WebMedia.

6.4 Validating Moor's prediction

Moor proposed the following hypothesis: "As technological revolutions increase their social impact, ethical problems increase" (Moor, 2005). As the technology matures, so do we expect ethical issues to escalate. CE literature and WebMedia proceedings reinforce this hypothesis.

Although an acute scarcity of ethical aspects in 3% of 1331 analyzed WebMedia publications, there was a translation to more interdisciplinary and applied occurrences. For example, Rodrigues et al. (2021) uses computational solutions to contribute to improving physiotherapeutic treatment; Coelho and de Oliveira (2021) deals with the phenomenon of pedophilia on the OSN Twitter; both Silva et al. (2021) and Silva and Neto (2021) deal with a less recurrent technical aspect, Hardware, to deal with critical situations involving motorcyclists; Serra et al. (2021) address the children's vulnerability to the exposure of sensitive content in messaging applications without disregarding their privacy and intimacy. Of these publications, only the report by Serra et al. (2021) has an occurrence of "moral", indicating that families have rights and duties to ensure the moral integrity of their children. These proposals refer to human participation at the validation level, without mentioning EC/IC, even as a future research step. The context of these researches presents more significant potential for the appreciation of ethical or moral aspects, compared to others focusing on technical aspects [18].

The Web is a computer system, and ICT significantly leverages multimedia solutions. Mulsemedia was the spotlight of one of the 2018 WebMedia talks by George Ghinea, the first author in a reference publication in Mulsemedia (Ghinea et al., 2014). Mulsemedia considers the scope of other human senses, extending vision and hearing and covering smell, touch, and taste. It is an area in its embryonic stage in terms of application. So, are we reflecting on the ethical aspects of Mulsemedia? How will Mulsemedia influence or impact Brazil, Brazilian society, or research? Or will the technologies enable by this area "pervade" Brazil without any prior ethical appraisal? Will we have dilemmas that lead to the forwarding of moral norms? Is there a possible relationship between Mulsemedia and the digital divide phenomenon?

6.5 Coexistence between Ethics and Technique

In this section, we present points of tension between technique and ethics arising from the analyses. At first, the perspective of accountability on technological artifacts when outsourced in an uncontrolled manner; followed by the mix between value judgments and technical qualifications, undermining their evaluations; ending with a critique of the idea of the academic, scientist, or researcher who, naively, only "does well" based on the idealistic preconceptions of their core activity.

Analyzing WebMedia publications selected by the wide screening, we noticed the predominance of several research categories, mostly pragmatic research (Recker, 2021) proposing artifacts to alter reality. Only a few research results evolve to reach the effectiveness or compliance of their proposals — for instance, the beginnings of Web technology (Berners-Lee, 1992).

[18]Research emphasizing technical aspects also involve ethical or moral aspects; however, these transcend the mere "technique" essence. The practice involving the supposed technique and the academic-scientific practice are subjects of ethical or moral study (Ioannidis et al., 2015).

During the 1980s, Berners-Lee developed significant, relevant, and high-perceived value research. This research composes what we know today as the Web, a computational system. It is impossible to say whether or not Berners-Lee considered the ethical or moral aspects of his research during its initial application or use. We can say with certainty that the artifact resulting from his research was out of his control. It exceeded all speculative limits of expected or desired compliance or effectiveness. His open letter highlights his concerns, including ethical dilemmas (Tim Berners-Lee, 2019). Even from the 1990s communications and speeches, we can say that the Web's intention, motivation, and justifications point toward positive and "good" values.

We also find a variety of factual judgments, or practical-utility values, mixed with value judgments. One example is Serra et al. (2021) statement "The choice of Flask was based on its good performance, simplicity of implementation, and ease of scalability.". Flask is not "good" because it does not lie, seeks to do good, helps people experiencing poverty, thinks about the community's well-being, and greets others... Flask is good (suitable) because it is useful in practice (hence the practical-utility value) as a tool or technical system. Another example is by Rodrigues et al. (2021), "Since there was good convergence of the model, there was no hyperparameter optimization.". The problem with these technical qualifications is the lack of quantitative precision, although they are not conceptually wrong. What is a good performance? What is good convergence?

The deficiency we perceive in WebMedia is the need for more appreciation for ethical aspects as realistic and rational consequences and the lack of ethical debate about ethical intentions and reasons through epistemology, starting from the idea. We believe that researchers, through their research, seek positive and "good" values, however, without reflecting on them, i.e., Ethics. Moreover, without reflecting on the moral acts associated with research and what it will generate. Computer systems and solutions have impacted and negatively influenced reality in such a way that the "corrective" perspective is already well-established (Spiekermann et al., 2022), i.e., Computing aimed at mitigating risks, preventing damages, or reversing the losses of Computing. Considering technological emphases on solutions to solve the same technological emphases on solutions can become a self-fulfilling cycle.

As well as several historical examples (Tolich, 2020), a devaluation of ethical or moral aspects and a perspective exclusively directed to technical aspects or practical-utilitarian values potentiate the emergence of controversial, severe or dangerous ethical dilemmas. For example, scenarios significantly similar to the emblematic Tearoom Trade study (Humphreys, 1975).

6.6 The "Digital Media Trade", Tearoom Trade revisited

At first, we import the Tearoom Trade research scenario (Humphreys, 1975) described by Babbie (2021) in a book chapter dedicated to ethics and politics of social research [19]:

> "As a graduate student, Laud Humphreys became interested in the study of homosexual behavior. He developed a special interest in the casual and fleeting same-sex acts engaged in by some male nonhomosexuals. In particular, his research interest focused on homosexual acts between strangers meeting in the public restrooms in parks, called 'tearooms' among homosexuals. The result was the publication in 1970 of the classic Tearoom Trade.
>
> What particularly interested Humphreys about the tearoom activity was that the participants seemed otherwise to live conventional lives as 'family men' and as accepted members of the community. They did nothing else that might qualify them as homosexuals. Thus, it was important to them that they remain anonymous in their tearoom visits. How would you study something like that?
>
> Humphreys decided to take advantage of the social structure of the situation. Typically, the tearoom encounter involved three people: the two men actually engaging in the sexual act and a lookout, called the 'watchqueen.' Humphreys began showing up at public restrooms, offering to serve as watchqueen whenever it seemed appropriate. Because the watchqueen's payoff was the chance to watch the action, Humphreys was able to conduct field observations as he would in a study of political rallies or jaywalking behavior.
>
> To round out his understanding of the tearoom trade, Humphreys needed to know something more about the people who participated. Because the men probably would not have been thrilled about being interviewed, Humphreys developed a different solution. Whenever possible, he noted the license numbers of participants' cars and tracked down their names and addresses through the police. Humphreys then visited the men at their homes, disguising himself enough to avoid recognition, and announced that he was conducting a survey. In that fashion, he collected the personal information he couldn't get in the restrooms.
>
> As you can imagine, Humphreys' research provoked considerable controversy both inside and outside the social science community. Some critics charged Humphreys with a gross invasion of privacy in the name of science. What men did in public restrooms was their own business. Others were mostly concerned about the deceit involved—Humphreys had lied to the participants by leading them to believe he was only a voyeur-participant. Even people who felt that the tearoom participants were fair game for observation because they used a public facility protested the follow-up survey. They felt it was unethical for Humphreys to trace the participants to their homes and to interview them under false pretenses.
>
> Still others justified Humphreys' research. The topic, they said, was worth study. It couldn't be studied any other way, and they regarded the deceit as essentially harmless, noting that Humphreys was careful not to harm his subjects in disclosing their tearoom activities. One result of Humphreys' research was to challenge some of the common stereotypes about the participants in anonymous sexual encounters in public places, showing them to be conventional in other aspects of their lives." (Babbie, 2021)

After analyzing dozens of publications from the WebMedia proceedings, we notice several of them with meta-scientific behaviors close to the ethical complexity of Humphreys' Tearoom Trade. People in digital environments have their data (personal or not, sensitive or not), information, details, intimacies, subjectivity, behaviors, interactions, reactions, and whatever

[19] When it comes to Research Ethics, Humphreys' Tearoom Trade often accompanies Milgram's "Behavioral Study of Obedience", and Zimbardo's "The Stanford Prison Experiment" (Tolich, 2020). We consider Humphreys' methodology close and adequate to our criticism and analysis in this specific and present context.

else it may be; extracted, stored, organized, selected, structured, categorized, typified, whatever else they do, without the slightest notion of it. Digital entities, humans or not, are constantly being targeted by academic-scientific, commercial, or bureaucratic initiatives (Igo, 2018a).

In the various OSNs, forums, messaging applications, intimate relationship applications, or wherever it may be, someone or some abstract entity will interact with the digital entities' data without necessarily or obligatorily consenting, whether gratis or clearly. Some without the mere notion of what it means to "set data as private or public" and others who, if they knew about these background practices, would deny the involvement of their data.

As with Humphreys' argument, there is a premise of "the greater good" mixed in with "scientist's good faith" (Humphreys, 1975; Tolich, 2020; Bos, 2020): "Extracting and using the data may seem controversial or morally questionable, however the benefits of the ends outweigh the risks of the means, applying the appropriate operations and mechanisms to preserve and protect the humans involved". This same reasoning safeguarded Humphreys in 1970. Both data from digital entities and bathrooms (Humphreys' research site) are considered "public"; in both scenarios, the "research subjects" are unaware that there is a researcher or scientist involved; the data is extracted by unknown or imperceptible means, without the owners having rational and enlightened knowledge of the scheme; many use the most advanced operations and mechanisms to avoid risks and protect the people involved (e.g., anonymization).

We find these meta-scientific phenomena profusely repeated through WebMedia. A combination of supposedly high academic benefits (e.g., high-value knowledge contribution), very low risks or hazards, and no regard for individual data ownership (Igo, 2018b; Salganik, 2017). While Humphreys's research was considered morally scandalous and a scandalous Research Ethics example in the 1970s, today, many "Tearoom Trades" constantly occur without any trace of IC or EC.

Igo (2018b) is quite emphatic about this rampant phenomenon. There is a significant amount of freedom for what different organizations and people can do with the data (personal or not, sensitive or not) of others. Furthermore, that extends to academic-scientists. At a later point in his life trajectory, Humphreys appears to regret his initial approach and admits that he would resort to other procedures if he were to do the same research again.

In OSN and many other online spaces, it is impossible or nearly impossible to obtain free and informed consent from anyone or everyone involved in research extracting data from hundreds of digital entities (Carvalho et al., 2021a). Moreover, this method is so widespread and repeated in an application that there is social support to justify it, despite the associated dilemmas. Even so, there is poverty, deficiency, and weakness in ethical or moral scrutiny behind them or even absence.

Although we perceive the practice of unscrupulous mining or extracting data from any digital space as morally questionable, ethically, what concerns us is the ethical or moral void surrounding this practice.

As similar examples, Tikkanen and Ross (2003) is entitled "Technological Tearoom Trade" and deals with men visiting gay online chat rooms. They often cite the relationship between their study and Humphreys' study, even noticing similar results, e.g., many "discreet" men frequent these virtual spaces. As a practical guideline, they recommend HIV education and awareness initiatives in these spaces. They admit that if the intention had a strong ethnographic claim, it might be necessary to adopt a procedure **close** to that carried out by Humphreys.

Davis (2020) also deals with public restrooms. And just like Humphreys, from a controversial topic, access of specific identities to bathrooms in general, e.g., transgender people in museum bathrooms. There is a section dedicated to data collection, where the author meta-scientifically discusses his difficulties at this stage, sympathizing (not necessarily agreeing) with the effort and challenge experienced by Humphreys.

Kargl et al. (2022) briefly invoke Tearoom Trade when dealing with privacy in mobile sensing, indicating the need for caution when dealing with psychosocial research.

Finally, an emblematic issue affecting controversial research on humans and their social dynamics (Tolich, 2020). How could the research have been conducted differently? How to eradicate harm through academic-scientific practice?

These issues directly involve several initiatives analyzed in the WebMedia proceedings. Who is benefiting from the research? What advantages or benefits does the research bring to those involved? The research involved epistemological, ethical, and moral deliberation from the idea until the book's publication. It is not that Humphreys (1975) has omitted, neglected, or belittled ethical or moral aspects – he presents a complete chapter on this topic in his work. Even so, many scholars perceive it as one of the most emblematic and expressive ethical dilemmas in Research Ethics.

Unlike many other Brazilian academic-scientific communication spaces, the epistemic nature of WebMedia enables and invites this moral dynamic in its research [20]. So we delve into this phenomenon, academic-scientists anonymously studying and analyzing other people, without the slightest awareness or notion that they are being analyzed, without IC or EC involvement, from a paradigmatic teleological perspective that the purposes supersede any prior elements, including certain principles and guidelines in Research Ethics. It does not matter if they are children or teenagers, black people, LGBTQIAP+, neurodivergent people, women, politicians, businessmen, or people in vulnerable or fragile situations. The results are satisfactory; they propose hypotheses, study the phenomena, and develop some models.

7 Conclusion

The influence of both the Web and multimedia on the lives of billions of people worldwide is apparent. However,

[20]The Brazilian Workshop on Analysis and Mining of Social Networks (BraSNAM) is an epistemological space similar to WebMedia. A similar analysis dedicated to BraSNAM is a potential future work. `https://csbc.sbc.org.br/2022/brasnam/` [accessed 08-08-2023]

this influence is only sometimes positive, considers ethical aspects, or is morality-oriented. In this sense, it is up to CE to reflect on the associated phenomena. So that this reflection has the structure, maturity, and formalism of academic-scientific research, it is equally subject to ethical scrutiny, for example, in carrying out so-called ethical research. This work analyzes the ethical aspects of the largest Brazilian symposium dedicated to the Web and Multimedia, WebMedia.

We present an SLR concerning WebMedia publications between 2005 and 2022, except 2007, considering ethical aspects. To the best of our knowledge, this is an innovative and unprecedented work, bringing a meta-research perspective on ethical aspects dedicated to WebMedia. We present a broad panorama, both wide and quantitative, as well as narrow and qualitative, in-depth. Given the results, we extend the discussion to enrich the contribution.

We followed protocols by Kitchenham (2004); Kitchenham and Charters (2007) to structure and formalize our research objectives. We assemble a WebMedia meta-scientific view, considering the majority of its proceedings. We analyzed 1331 papers, 52 (≈4%) presented some ethical aspects, and, from these, one stood out. However, we disregard this article from the qualitative synthesis for its brevity.

Less than 10% of the publications presented some ethical aspects, including the respective research. The occurrences of EC, IC, or a combination of both did not reach 2% of the publications. Even though the Web and Multimedia are cross-cutting themes in technical and non-technical aspects, the first is dominant. In contrast, the deliberations related to the second are limited, as well as on Ethics or Morals. Therefore, we conclude by presenting some guidelines for community appreciation, embracing a culture of ethical aspects.

Suppose it is in WebMedia's interest to develop an ethical culture. So we recommend:

- **Advertise IC and EC explicitly**: Indicating the importance of IC and EC in the call for papers, directing interested parties to materials on the topic and examples of a standard template for IC documentation;
- **Qualitative rigor**: showing rigor when it comes to the research workshop/contest or extensive research projects, e.g., thesis, dissertation. Positively evaluating communications that respect and deal with ethical aspects, especially with relevance and quality;
- **Ethical and moral instruction**: promote activities, and instructional exhibitions on Research Ethics, Ethics in the engineering of Web or Multimedia solutions, and Ethics in Web and Multimedia epistemology;
- **Engaging and bringing together the community**: raise debates, and round tables on ethics or morals to forums, commissions, and groups;
- **Concretely demanding for ethical or moral aspects**: Motivate researchers, or research groups, to insert sections on ethical aspects in scientific communications, preferably going beyond the mere statement that the research follows norms, rules or laws.
- **Engaging politically in the Brazilian Research Ethics scenario**: The WebMedia community, through its members or its Special Commission, maintain institutional contact with the SBC or with other collectives to deal with the topic of institutional and objective Research Ethics in Brazil, e.g., deliberating on EC and similar topics at different levels, and in higher spheres;

It is essential to observe that it is beyond the scope of our work to analyze whether, *de facto*, the published researches are ethical/moral or not. For example, research associated with analyzed publications may have dealt with EC/IC, although the authors omitted this information from the paper. That is, while the absence of communicated ethical aspects is not a necessary or sufficient condition to categorize research as "unethical"/"immoral", the clear and correct presence of these elements in scientific communication positively points towards an objective direction indicating ethical/moral research.

Some threats to validity are typical in SLR (Petersen et al., 2015). The findings, results, and conclusions were drawn and discussed among researchers to avoid bias. To preserve repetition, we aim to present the protocol with maximum completeness and documentation. To preserve auditability, we make the data available online for review and analysis.

The analyzed set is a limitation of this present work. We limit the scope to WebMedia by the event's very essence, so we do not generalize to "all Brazilian research about Web and Multimedia" but to the most relevant event dedicated to this area.

In addition to the future works punctually positioned through this present work, interested ones can (i) search and expand this proposal to Web, Hypermedia, and Multimedia research outside the WebMedia; (ii) propose practical referrals to improve the ethical scenario, enhancing the respective aspects; (iii) develop a computational system to automate this present research procedure, mainly dedicated to wide screening; (iv) conduct a comprehensive, longitudinal, and critical study comparing ethical aspects between academic-scientific communities as phenomena of the scientific culture of each organized network (v) conduct a consultation of Plataforma Brasil with information from the authors considering the study period to verify whether those studies were approved.

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