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UNCOVERING ETHICAL VALUES IN INFORMATION SYSTEMS DEVELOPMENT METHODOLOGIES: A SYSTEMATIC LITERATURE REVIEW

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ABSTRACT

Information system development involves a lot of tools, infrastructures, and humans. The many phases in system development need humans to interact and work with each other to obtain the goal: to complete information system development. These interactions of humans require the right ethics to ensure that the information system development can be successful. For example, ethical leadership is a vital component in determining the success of any project related to information system development in organizations. The aim of this study is to identify the ethical values which are important in information system development methodology phases. This systematic literature review (SLR) comprises of four databases, and these are IEEE Xplore, ProQuest Dissertations and Theses, Scopus, and Emerald Insight, using the PICOC framework and applying several inclusion and exclusion criteria. 172 papers from 2018 to present were found to have discussed the ethical values that are needed in the system development methodology phases. The study finds that there are 10 ethical values highlighted in those papers, for example: ethical leadership, ethical team dynamics, trust, consideration, and so on. The findings from this paper are important for the people who are involved in system development methodology to practice the right ethical values to ensure the success of the system development.

Keywords*: Codes of Conduct, Ethical Values, Development Methodology Phases, Information System, Software Development Phases.*

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1. Introduction

Ethical values are a cornerstone of successful information systems (IS) development, fostering trust, fairness, and collaboration among stakeholders. Even in the era of Artificial Intelligence

(AI), the development of AI systems requires certain human values and fairness-aware mechanisms embedded in the systems development methodologies (Sridhar, 2025). Projects grounded in ethical principles are more likely to achieve sustainable outcomes, as they promote satisfaction, transparency, and harmonious working relationships (Mishra et al., 2011). This is especially critical as IS projects evolve from localized initiatives to large-scale, distributed, and global efforts. Virtual and IT projects now operate in multicultural, cross-border contexts, where differing norms and expectations require stronger adherence to shared ethical values (Lee, 2009).

Ethical values such as integrity, transparency, fairness, and respect serve as guiding principles for behavior (Mercader, 2006). Within system development methodology (SDM) phases, these values help bridge differences between diverse stakeholders from IS and IT backgrounds. Information Systems (IS) development methodology refers to a structured, systematic process used to plan, design, implement, test, and maintain information systems, encompassing phases such as requirements analysis, system design, development, implementation, and maintenance. It provides a framework that integrates technical procedures with managerial and organizational practices to ensure that IS solutions meet user and business needs effectively and ethically.

Studies have shown that ethical leadership, inclusive communication, and stakeholder engagement enhance project success (Hill, 2000). Conversely, neglecting ethics can lead to privacy breaches, algorithmic bias, discrimination, reputational damage, and diminished user trust (Al-Saqqa et al., 2020; Mubarak et al., 2022). For example, studies involving sensitive populations have shown that weak methodological and ethical procedures such as inadequate sampling, unclear data validity, or failure to protect vulnerable users can significantly compromise the quality and trustworthiness of research outcomes (Judi & Mohamed, 2024). Prior studies have examined ethics in IS from multiple perspectives, such as data privacy, algorithmic accountability, and professional codes of conduct (Chamtitigul & Li, 2021; Rahman et al., 2022; Saleem et al., 2018). While valuable, these works often focus on isolated issues or single phases of the SDM (e.g., requirements gathering or implementation) rather than a holistic, cross-phase integration of ethical values. Moreover, most studies stop short of comparing ethical considerations across methodologies, leaving little guidance on how ethics are systematically embedded throughout development life cycles. This fragmented treatment creates a research gap: there is insufficient understanding of how ethical values are applied consistently across all SDM phases and how such integration affects project outcomes.

The urgency of this research stems from the accelerating reliance on digital systems in crucial domains, for instance healthcare, finance, and public services. The rapid adoption of AI-driven systems and globalized development teams heightens the risk of unethical outcomes ranging from biased decision-making to large-scale privacy violations if ethical principles are not systematically embedded (Hofman et al., 2023). Moreover, systems designed for vulnerable populations, such as mobile applications supporting individuals with mild to moderate dementia, further highlight the necessity of embedding ethical considerations throughout system development to ensure safety, trust, and responsible use (Cheng & Sabran, 2023). Policymakers and industry leaders are increasingly calling for frameworks that align system development with ethical and societal values, yet practical and evidence-based insights remain scarce (Kottur, 2024). To address these gaps, this paper systematically reviews existing literature to uncover the ethical values embedded in IS development methodologies, analyze how they are applied across different phases, and identify shortcomings in prior approaches. By synthesizing secondary studies and highlighting areas of neglect, this SLR provides actionable insights for researchers, practitioners, and policymakers to integrate ethics more effectively, ensuring IS projects deliver both technical success and societal benefit.

2. Literature Review

The integration of ethical values in information systems (IS) development has been widely recognized as critical to ensuring that technological solutions are socially responsible, trustworthy, and aligned with stakeholder needs. Prior research has examined ethics in IS projects from multiple perspectives, including leadership behavior, stakeholder engagement, team collaboration, and decision-making processes. For instance, Lee (2009) emphasized the role of e-ethical leadership in fostering trust and transparency in virtual project teams, while Mubarak et al. (2022) highlighted how ethical leadership enhances psychological empowerment and project performance in technology-based organizations.

Ethical considerations are particularly relevant across the phases of system development methodologies (SDMs), requirements gathering, design, implementation, and maintenance, where decisions can impact privacy, fairness, and inclusivity. For example, community based IS design research has shown that using frameworks such as Activity Theory helps ensure stakeholder needs, social context, and ethical considerations are integrated throughout the system development process (Reduan & Kamaruddin, 2025). Chamtitigul & Li (2021) found that team learning and ethical leadership positively influence team performance in software development projects, underscoring the link between ethics and project success. Similarly, Mishra et al. (2011) argued that adopting an ethical approach throughout the project lifecycle contributes to sustainable project outcomes.

In software engineering, ethical issues often intersect with technical challenges. Saleem et al. (2018) discussed the ethical implications of linked data technologies, particularly in relation to privacy and security, while Rahman et al. (2022) examined responsible AI development, stressing the need for fairness, accountability, and transparency in system design. Agile and DevOps environments have also been studied for their capacity to embed ethical values through collaborative culture, iterative feedback, and stakeholder inclusivity (Al-Saqqa et al., 2020; Hofman et al., 2023). In the healthcare domain, ethical system development is crucial to safeguarding dignity and autonomy, particularly for vulnerable user groups. For example, Cheng and Sabran (2023) demonstrated that mobile applications for dementia care require high levels of usability, trustworthiness, and ethical design to ensure safe daily functioning for users (Cheng & Sabran, 2023).

Despite these contributions, the literature remains fragmented, with studies often focusing on specific ethical dimensions or isolated SDM phases rather than providing a holistic perspective. This gap highlights the need for a systematic literature review that consolidates existing knowledge, identifies the most salient ethical values across SDM phases, and examines how these values are operationalized in diverse project contexts. By addressing this gap, the present study aims to offer a comprehensive framework for integrating ethical values into IS development, contributing to both scholarly discourse and practical guidance for practitioners.

Secondary studies examining ethics in Information Systems (IS) and software engineering have offered significant insights into how ethical principles are embedded within system development processes. A study conducted a systematic literature review (SLR) to explore ethical considerations in software design and development, resulting in a stakeholder map and value model that categorizes ethical values and illustrates their interrelationships (M. Alidoosti et al., 2022). Another study extended this work through an extensive review of 623 publications, of which 85 were analyzed in depth (R. Alidoosti et al., 2025). Their study emphasized the identification of stakeholder concerns, stakeholder classifications, and value extraction methods, producing a structured taxonomy of ethical values and their interconnections. In a complementary direction, a research performed a focused SLR on ethical requirements elicited from user reviews, particularly in AI and ML applications, and synthesized techniques for extracting requirements related to privacy, transparency, fairness, and accountability (Sorathiya & Ginde, 2024).

Collectively, these secondary studies provide valuable foundations for understanding the role of ethics in IS and software engineering. However, they also reveal that the existing literature remains fragmented, often limited to specific ethical aspects, stakeholder groups, or methodological contexts rather than presenting a comprehensive, process-oriented ethical framework for system development. Addressing these gaps, the present review contributes: (1) a comprehensive mapping of ethical values explicitly aligned with each phase of the IS development lifecycle, from requirements elicitation to maintenance; (2) a consolidated list of ten ethical values ethical leadership, team dynamics, trust, efficiency, innovation, accuracy, competency, consistency, responsibility, and consideration derived from 172 primary studies; and (3) a holistic framework that elucidates where ethical values are embedded or overlooked throughout the development process. By doing so, this study advances the existing body of secondary research by offering a more structured and phase-oriented understanding of ethics within IS development.

3. Methods

3.1 Overview of the Method

This study uses a systematic literature review method. This method is known to be a thorough, organized, and objective approach for finding, assessing, and synthesizing pertinent research studies on a certain subject or research question (Kitchenham & Charters, 2007).

The importance of taking ethical principles into account during the technical phases is growing as information system development continues to change. To ensure that the resulting systems are trustworthy, dependable, and secure, ethical considerations in information system development are essential.

However, depending on the approach being utilized, the degree to which ethical ideals are included in information system development methodologies may differ. Through comprehending the integration of ethical ideals in all aspects of the approach for developing information systems, a systematic literature review is needed. Thus, this SLR has been conducted following Kitchenham's guidelines for systematic literature review of software engineering (Kitchenham & Charters, 2007). The review protocol and the steps are followed accordingly as well.

3.2 Planning Stage

The planning phase is essential to the review process's effectiveness. The review was carefully planned to direct a comprehensive review of the existing literature on identifying the ethical values in information system development methodology phases. The review aims to identify the main findings, methodologies, and limitations of the current knowledge base of research to discuss a clear understanding of the topic. This stage includes:

3.2.1 Define the Research Question

Defining the research question clearly is the primary step in the planning stage. The focus of this SLR is to determine the ethical values in information system development methodology phases. Thus, the authors explored the contribution of previous studies regarding the importance of ethical values in information system development methodology phases and published papers range years starting from 2018 to 2023.

The research question has been formulated following the PICOC framework, which consists of five factors such as population, intervention, comparison, outcome, and context. This framework is also suggested by Kitchenham to be used for software engineering-related

systematic literature reviews (Kitchenham & Charters, 2007). Based on the PICOC framework, any software development is considered as the population, whereas the outcome is ethical value, and the context is the information system development methodology phases. In this study, there is no comparison factor or intervention. Thus, the single question (RQ) to answer for this study is:

What are the ethical values in information system development methodology phases?

3.2.2 Conduct a Preliminary Search

The researchers started by identifying relevant keywords that are related to the research question. These keywords could include terms such as "ethical values," "information system development," "methodology phases," and "software development ethics". This helped the authors to identify the keywords to use in the search.

3.2.3 Identify the Databases

In this case, the relevant disciplines may include information systems, system development, and methodologies. The authors determined and chose the databases used related to these disciplines. Thus, some popular databases, including Scopus, Emerald Insight, IEEE Xplore, and ProQuest Dissertations and Thesis were chosen.

3.2.4 Evaluate Search Results

To evaluate, the researchers checked the search results to make sure the articles found are pertinent to the research query. Authors started by eliminating any duplicates from the search results and then reviewed the titles along with the abstracts of the remaining papers to spot any that are obviously unrelated to the study topic.

The search results' publication dates were checked as well. To make sure the literature review is current and pertinent, the authors gave special attention to recent articles.

3.3 Conducting Stage

3.3.1 Searching Relevant Studies

Defining search strings and types of databases is the first step in conducting SLR. Formulating a search strategy and finding the right keywords to be included in the search string is a crucial task as it will determine and guide towards the desired evidence from different search databases (Marcos-Pablos & Garcia-Peñalvo, 2018). In this stage, Parsif.al online tool was used to formulate the search string to find relevant papers on ethical values in information system development methodology phases. Below is the search string generated by Parsif.al, and it has been used to search for the relevant papers:

("software development projects" OR "agile development project" OR "agile development projects" OR "application development projects" OR "application engineering project" OR "development operation projects" OR "devops" OR "in house development" OR "in house developments" OR "information system development projects" OR "rapid application development project" OR "rapid application development projects" OR "scaled agile development" OR "scrum development project" OR "scrum development projects" OR "software development assignments" OR "software engineering project" OR "system development projects") AND ("importance" OR "acquire" OR "critical" OR "crucial" OR "essential" OR "fundamental" OR "high-priority" OR "imperative" OR "indispensable" OR "key" OR "meaningful" OR "momentous" OR "needs" OR "noteworthy" OR "paramount" OR "pivotal" OR "relevant" OR "significance" OR "substantial" OR "valuable" OR "values" OR

"vital" OR "weighty" OR "worthwhile") AND ("N/A") AND ("ethical values" OR "code of conduct" OR "ethical norms" OR "ethical principles" OR "ethical standards" OR "ethics and integrity" OR "good values" OR "integrity" OR "moral code" OR "moral principle" OR "moral principles" OR "moral values" OR "morality" OR "principles of right and wrong" OR "values and principles of ethical behavior" OR "virtues").

There are four databases, as shown in Table 1, used in this study to find related papers relevant or connected to the topic. The string was used to search in the established databases such as IEEE Xplore, ProQuest Dissertations and Theses, Scopus, and Emerald Insight. These databases were selected as they are among the popular databases internationally and relevant to the study of the IT field.

Table 1. Imported Studies

Database	Number of imported studies
IEEE Xplore	2283
ProQuest Dissertations and Thesis	264
Scopus	44
Emerald Insight	25

Table 1 depicts the total number of imported studies from the mentioned databases, where IEEE Xplore had the significantly highest number of relevant papers, along with other databases like ProQuest Dissertations and Theses, Scopus, and Emerald Insight.

3.3.2 Study Selection

Study selection was carried out to answer the RQ of this SLR and to determine which are primarily connected in the existing papers from the databases that are related to ethical values in information system development methodology phases. The identification process was carried out using study inclusion and exclusion selection criteria. These mentioned criteria were chosen in accordance with the research questions. All searching process in the databases will follow the outlined inclusion and exclusion criteria to get accurate and relevant papers for this study, but there were some limitations in ProQuest Dissertations and Theses and Emerald Insight databases, whereby the former only has dissertations and theses, whereas the latter only has articles. The inclusion and exclusion criteria of this study are as below:

Table 2. Inclusion And Exclusion Criteria

Inclusion	Exclusion
Papers that are published from 2018 and above	Papers that are published older than 2018
Articles	Papers that are not written in English
Dissertation and thesis	Papers that are not related to software development
Journals	

Table 2 lists four inclusion criteria and three exclusion criteria, which were followed in this SLR. Below is Table 3 detailing the paper selection process.

Based on prominent methodologies, the authors intended to consider all papers coming from the results without applying any conventional quality check measures that might restrict the SLR to have a broader scope (Genc-Nayebi & Abran, 2017; Kitchenham, 2004). However,

according to the study of Kitchenham (Kitchenham, 2004), such SLR methodology do not mandatorily require including any quality checking step that might have restricted the study to overlook some papers instead of considering all.

Table 3. Papers Selection Process

Database	Initial number of papers imported from databases	Number of papers after inclusion and exclusion	Accepted papers
IEEE Xplore	2283	135	135
ProQuest Dissertations and Thesis	264	40	22
Scopus	44	7	7
Emerald Insight	25	8	8

Table 3 shows the papers' selection process from the four online databases. There were a total of 2616 papers imported from the mentioned databases. After that, the inclusion and exclusion criteria were further used to filter the studies, and the number of papers was reduced to 190. The final filtration was conducted by going through the study titles along with abstracts, and lastly, 172 papers were selected. Below is figure 1 showing the paper selection process.

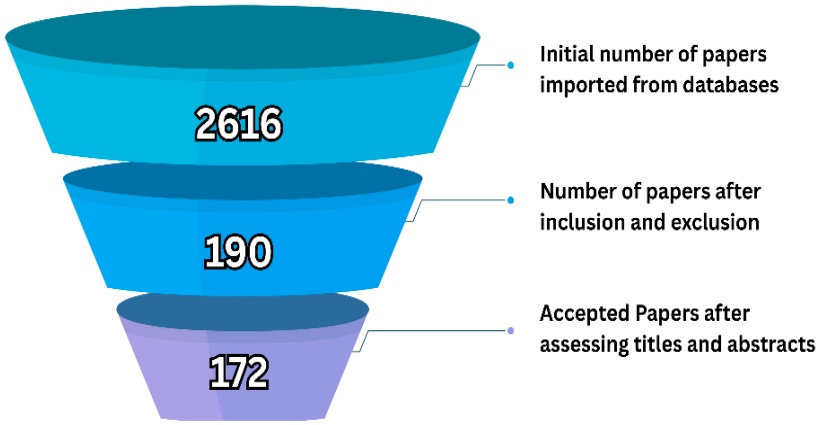

Figure 1. Papers Selection Process

In figure 1, the three main factors of narrowing down the search results are visualized, which narrates the paper selection process for this study.

3.3.3 List of Selected Papers

As stated in the selected studies section, the total number selected studies from the digital library were 2616 paper and 172 papers were incorporated in the data extraction phase. The chosen papers were extracted through the exclusion and inclusion assessment. The inclusion and exclusion criteria, as stated in the selection stage to remove the paper shall be excluded from this review.

4. Results

This study was guided by the research question:

RQ: What are the ethical values in information system development methodology phases?

To answer this question, 172 papers were analyzed from the four selected databases. The synthesis of these studies revealed a set of ethical values consistently mentioned in the context of software and information system development. During the extraction process, similar terms and overlapping concepts were consolidated to avoid redundancy. For instance, ethical aspects described as "the significance of interaction and communication" were categorized under ethical team dynamics, while expressions such as "increasing effort estimation for better project management" were standardized under innovation. This consolidation ensured that the final set of values reflected clear, standardized categories.

As a result, ten core ethical values were identified across the literature: ethical leadership, ethical team dynamics, trust, efficiency, innovation, accuracy, competency, consistency, responsibility, and consideration. Each of these values was supported by multiple studies, though their frequency varied considerably.

Table 4 summarizes the occurrence of these values in the selected studies. Ethical team dynamics was the most cited value, appearing in 60 papers, followed by efficiency (51 papers), ethical leadership (36 papers), innovation (32 papers), and trust (31 papers). The remaining values, accuracy (23 papers), competency (17 papers), consistency (14 papers), responsibility (9 papers), and consideration (9 papers), were less frequently mentioned but still considered important in shaping ethical outcomes in IS development.

These findings provide a comprehensive response to the research question by consolidating diverse ethical concepts into a structured framework of ten values that span across SDM phases.

Table 4. List Of Ethics

No.	Ethical Values	Studies (S)	Total Studies (S)
EF1	Ethical leadership	E1,E3,E5,E7,E8,S1,S4,I1,I2,I4,I12,I17,I18,I37,I38,I39,I43,I63,I71,I73,I76,I78,I103,I110,I134, P3, P4, P9, P10, P14, P15, P18, P20, P21, P24, P26	36
EF2	Ethical team dynamic	E1,E3,ES,E7,E9,S2,S3,S5,S6,I1,I2,I3,I4,I5,I6,I7,I8,I9,I11,I12,I14,I16,I17,I19,I23,I25,I27,I34,I35,I38,I39,I43,I47,I52,I56,I57,I58,I62,I67,I69,I71,I73,I75,I80,I88,I91,I92,I96,I97,I107,I112,I117,I123,I125,I127,I130, P1, P13, P16, P20	60
EF3	Considerate	E2, E4, ES, S7,172,182,192,194, P25	9
EF4	Trust	E4,E6,S5,S6,I1,I18,I32,I33,I44,I45,I48,I49,I60,I67,I68,I83,I85,I87,I90,I92,I99,I107,I108,I111,I112,I113,I119,I120,I121,I132,I134	31
EF5	Responsible	S2,I1,I33,I51,I64,I69,I100,I104,I132	9
EF6	Competency	I2, I8,I26,I28,I44,I53,I54,I55,I69,I72,I76,I112,I115,I117,I130, P6, P15	17
EF7	Innovative	I3,I8,I13,I16,I20,I21,I22,I25,I27,I28,I30,I31,I48,I56,I66,I70,I95,I96,I97,I98,I99,I102,I103,I105,I113,I115,I116,I122,I128,I133, P6, P23	32
EF8	Efficient	I10,I21,I22,I25,I27,I28,I30,I31,I37,I40,I41,I42,I43,I46,I57,I59,I60,I63,I64,I66,I74,I77,I79,I81,I83,I84,I86,I88,I89,I91,I94,I96,I97,I100,I101,I102,I105,I106,I108,I09,I111,I113,I116,I118,I119,I126,I129,I131,I133,I134	51
EF9	Consistency	I18,I24,I31,I34,I35,I39,I46,I89,I93,I103,I109,I110,I124, I135	14
EF10	Accurate	I15,I30,I34,I36,I37,I50,I54,I55,I58,I61,I65,I89,I101,I102,I104,I106,I114,I117,I118,I124,I129,I131,I135,P25	23

The issue found that many studies that emphasize “Ethical team dynamic” have the highest number of papers found ethical in development of software methodologies (60 papers), and the second highest number of papers (51 papers) ethic is “Efficient”. And followed by “Ethical leadership”, “Innovation”, “Trust”, “Accurate”, “Considerate”, and “Responsible”. It is important for researchers to brief and explain each of the ethnic conditions and behaviours. Ethics may consider any good behavior and result produced from the implementation of the system development methodology. Table 5 below lists the definition of each ethic.

Table 5. Ethical Definition

No.	Ethical Values	Definition
EF1	Ethical leadership	The act of setting an example, making choices based on moral beliefs and ideals, and acting consistently with honesty and integrity is referred to as ethical leadership. A moral leader sets the tone for the group or team and fosters an environment of openness, honesty, and responsibility. The example of definition and behaviour can be related to transparency, accountability, fairness, integrity, etc.
EF2	Ethical team dynamic	An ethical team dynamic is one in which team members are dedicated to respecting ethical principles and values in their interactions, as well as in their work and decision-making. Here are some essential components of a moral team dynamic. Building respect and a feeling of purpose among team members through promoting an ethical team dynamic can improve collaboration, output, and success.
EF3	Considerate	Considerate is making ethical decisions with care and considering the needs and views of those impacted byr one’s decisions. It entails acting reasonably, just, and respectfully towards all parties involved while being conscious of the potential effects of someone’s actions on other people. Empathy, respect for variety, justice, open-mindedness, transparency, and other virtues are examples of thoughtfulness.
EF4	Trust	Trust is the idea that developing and upholding trustworthy relationships and organisations is crucial to acting ethically. Trustworthiness and trust in others are both aspects of the trust ethic. Honesty, integrity, responsibility, and other virtues are examples of ethics.
EF5	Responsible	The concept of responsible ethics states that engaging in moral behaviour entails accepting responsibility for the results of an individual’s choices and actions and being aware of how those decisions affect other people and the wider community. Being proactive in resolving ethical issues and trying to act in ways that advance the greater good are both essential components of responsible ethics.
EF6	Competency	The concept of a competent ethic states that engaging in moral behaviour calls for a high level of skill and expertise in our fields of work or study. It entails having knowledge of and experience in our fields and employing our skills to further the common good. Some examples of competency elements include mastery of skills, commitment to quality, results-focused thinking, and responsibility and accountability.
EF7	Innovative	The term "innovative ethic" relates to the idea that adhering to moral principles calls on us to approach problem-solving and dealing with ethical dilemmas in an innovative, flexible, and forward-thinking way. It entails being receptive to fresh perspectives and methods and using our imagination and ingenuity to create original answers to challenging moral conundrums. Examples include imagination and creativity, adaptability and flexibility, and openness to new ideas and taking chances.
EF8	Efficient	The term "efficient ethic" relates to acting morally, calling for making the best use of our time, resources, and energy. It entails paying attention to how one should use resources and trying to accomplish our tasks, minimising waste, and maximising output. It entails knowing how to use resources, setting

		priorities for tasks and activities, pursuing continual improvement, and working with others to accomplish shared objectives effectively and efficiently.
EF9	Consistency	The concept of consistency ethic states that to behave ethically, one must conduct in a manner consistent with our values and ideals and refrain from acting in a contradictory or hypocritical manner. It entails acting in accordance with ideals and being conscious of how actions affect other people and the environment. One may establish trust with others, help the greater good, and uphold integrity in our personal and professional lives by upholding a consistent ethic. It entails acting in a way that is consistent with ideals, refraining from hypocrisy, and developing self-awareness.
EF10	Accurate	Accurate ethics talks about being accurate, truthful, and honest in acts, communications, and decision-making. It entails avoiding deceit, misrepresentation, and incorrect information, as well as ensuring that our judgements and actions are supported by accurate and trustworthy information. Accurate behaviour enables to increase our credibility and ability to be trusted by others, as well as to make morally sound decisions and advance the greater good. It entails speaking the truth, upholding correctness and dependability, maintaining objectivity and impartiality, and taking responsibility for our actions and judgements.

Below in figure 2, the overall findings of the SLR are depicted, enlisting the 10 ethical values in information system development methodology phases.

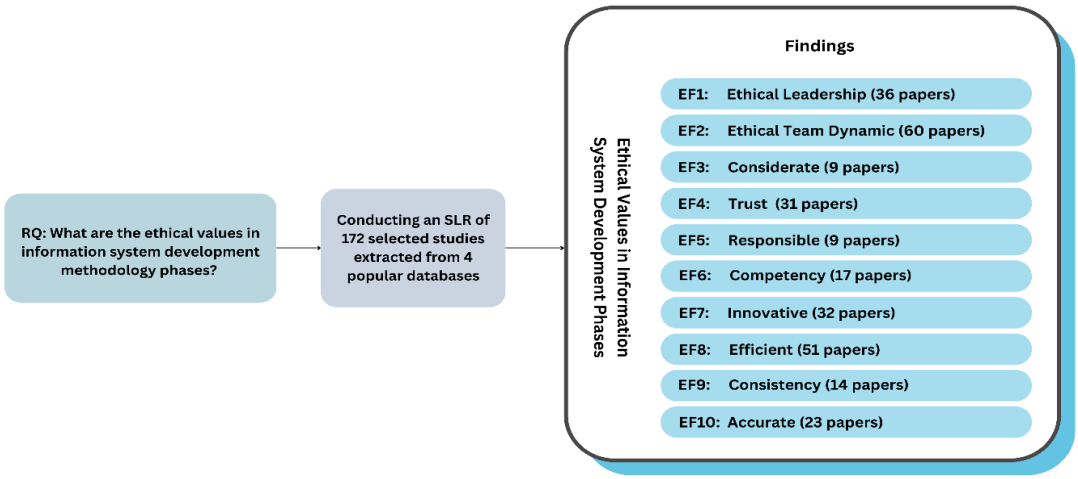

Figure 2. Findings of the Ethical Values in Information System Development Methodology Phases

Figure 2 details the research question and 10 ethical values in information system development methodology, found in 172 selected studies of this SLR.

5. Discussion

This SLR was set out with the single purpose of answering the research question: What are the ethical values in information system development methodology (SDM) phases? The analysis of 172 studies revealed ten distinct ethical values: ethical leadership, ethical team dynamics, efficiency, innovation, trust, accuracy, competency, consistency, responsibility, and consideration. These findings provide a consolidated understanding of how ethical dimensions are embedded across SDM phases.

5.1 Dominant Ethical Values

Among all values, ethical team dynamics emerged as the most prominent, discussed in 60 papers. This emphasizes the importance of communication, collaboration, and teamwork in IS development, where multiple stakeholders must coordinate effectively to achieve project goals. Prior studies support this, showing that team cohesion and open communication are critical not only for project success but also for reducing conflict and promoting inclusivity (McClurg et al., 2024; Musonda & Okoro, 2022; Shafiq et al., 2021; Ünal & Rötting, 2022). The strong emphasis on team dynamics reflects the inherently collaborative nature of system development, where ethical behavior within teams directly shapes project outcomes.

The second most cited value was efficiency, appearing in 51 studies. Efficiency as an ethical principle is consistent with the expectation that IS projects must deliver high-quality results while minimizing waste of resources, time, and costs. This aligns with literature on software engineering that identifies efficient practices—such as optimized processes, automation, and agile delivery as not only operationally beneficial but also ethically responsible toward stakeholders who invest resources (Dorndorfer & Schmidtner, 2022; Kumar et al., 2022; Techapalokul & Tilevich, 2019).

Ethical leadership was also highly emphasized. Leadership defines organizational culture and directly influences the extent to which other ethical values (e.g., transparency, fairness, accountability) are practiced. The literature consistently demonstrates that ethical leaders set behavioral norms, inspire trust, and enhance team performance (Chamtitigul & Li, 2021; Trafican & Olsen, 2022). This finding underscores the interconnectedness between leadership and team dynamics: effective leaders model ethical behavior that cascades across teams, creating a culture of responsibility and integrity.

5.2 Supporting Ethical Values

Beyond the top three, values such as trust and innovation also received significant attention. Trust is essential in sustaining long-term relationships within and between organizations, especially in distributed or multicultural development contexts (Baxter et al., 2022; Thanetsunthorn & Wuthisatian, 2019; Yoon & Lee, 2019). Without trust, collaboration weakens, and resistance to adoption may increase. Similarly, innovation is viewed as an ethical responsibility, where developers are encouraged to pursue creative solutions that enhance system performance and societal benefit (Sleeva, 2021; Smith Jr. & Merchant, 2022). These values highlight that ethics in SDM is not limited to compliance but also extends to advancing collective well-being through innovation and relational integrity.

Other values, including accuracy, competency, consistency, responsibility, and consideration, were less frequently mentioned but remain crucial. Accuracy ensures that decisions and system outputs are based on correct and reliable information (Song et al., 2019). Competency reflects the moral duty of developers to maintain up-to-date skills and deliver work of high quality (Hamm-Simmons & Bakari, 2019). Consistency promotes reliability and prevents contradictions in system design and implementation (Rodriguez et al., 2018). Finally, responsibility and consideration, though discussed in fewer than ten papers each, are particularly important in safeguarding user rights, promoting inclusivity, and ensuring accountability to broader society (Kakar, 2018). Their underrepresentation in the literature suggests a research gap, as these values are vital in addressing ethical concerns such as data misuse, exclusion, or harm to vulnerable groups.

5.3 Implications

The distribution of ethical values across the literature indicates that researchers and practitioners prioritize values directly linked to project success (e.g., team dynamics, efficiency, leadership) over those closely associated with societal accountability (e.g., responsibility,

consideration). This imbalance suggests that while IS development is becoming increasingly outcome-driven, there is a risk of overlooking broader ethical obligations.

For researchers, this highlights opportunities to further explore how underrepresented values, particularly responsibility and consideration, can be operationalized across SDM phases. For practitioners, the findings suggest the need to embed ethics holistically rather than selectively, ensuring that less cited but socially critical values are not neglected in practice. For policymakers, the results underscore the urgency of embedding ethical standards in professional guidelines and regulatory frameworks to ensure accountability in system development.

5.4 Limitations

As a research limitation, the study was constrained by the availability of databases. 2,616 papers which were retrieved from four subscribed databases by the authors' institutions were firstly analyzed and then considered through three filtration steps. However, researchers did not have access to other databases beyond the institutional subscription, which may have limited the scope of the literature coverage.

6. Conclusion

In this study, researchers performed a systematic review of the literature to find the ethics related to the system development correlating to information technology system development. The results were combined with an automatic search performed on an online database. In the initial search, 2616 papers from four online databases were analyzed and further by adopting three filters, 172 papers have been selected using a set of selection method that include inclusion and exclusion criteria for answering the RQ. As the finding of the review, ten (10) ethics were found, which are Ethical leadership, Ethical team dynamic, Considerate, Trust, Responsible, Competency, Innovative, Efficient, Consistency, and Accurate. Ethics will help project managers and developers to know the importance of system development methodology, which helps the project go smoothly. The project managers and developers will also encourage and brief team members on the benefits of performing the system development methodology.

Indicating to future work, the authors suggest to conduct another SLR that consists of another database, which consists of different projects. Moreover, it is also encouraged to follow a specific quality checklist in selecting papers for the SLR which would provide more narrowed and specialized scope. Also, studying the ethics of system development according to the phase gives a deep understanding of the importance of embracing the ethics in each development phase. This important ethic has been explained to all parties involved in the system development methodology to ensure all parties are satisfied and gain more experience and knowledge in each development.

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Author Contribution
Zahidah Zulkifli oversaw the study's conceptualization, methodology design, supervision, and overall project coordination. Noor Hayani binti Abd Rahim handled data curation and carried out the formal analysis. Tahmid Alam conducted the investigation and data extraction, as well as drafted the initial version of the manuscript. Fakhrul Hazman Yusoff, Mohammad Masudur Rahman, and Zahidah Zulkifli supported the validation and visualization processes and contributed to the manuscript's review and editing. All authors participated in interpreting the findings, approved the final manuscript, and consented to its publication.

Conflict of Interest
No conflict of interest to declare.

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