A Systematic Review on Industrial 5.0 Readiness For Sustainability Practices Considering Cultural Influences

Tia Tanjung, Ihwan Ghazali, Wan Hasrulnizzam Wan Mahmood, Safarudin Gazali Herawan

Abstract—The emergence of Industry 5.0 brings a renewed focus on human-centred innovation and sustainable development. As industries transition beyond automation toward greater collaboration between humans and intelligent technologies, understanding their readiness becomes crucial. This study presents a systematic review examining key factors influencing Industrial 5.0 readiness, with particular attention to how cultural values shape sustainable practices. A total of 45 peer-reviewed articles published between 2018 and 2024 were selected based on predefined inclusion criteria. The analysis identifies nine dominant constructs relevant to sustainability in Industry 5.0, including human-centric innovation, leadership vision, digital competence, and environmental commitment. In addition, cultural dimensions such as uncertainty avoidance, individualism versus collectivism, and long-term orientation significantly influence adoption levels across different regions. The review highlights that countries with strong cultural alignment toward innovation and environmental stewardship are better prepared for Industry 5.0 transformation. This paper contributes to both academic and practical discussions by offering a conceptual foundation for developing culturally adaptive guidelines to support a sustainable transition. The findings suggest that policymakers and industry leaders should integrate cultural insights into strategic planning for a sustainable and inclusive industrial transformation.

Index Terms–Industry 5.0, sustainability readiness, cultural influence, systematic review, transition framework

I. INTRODUCTION

In recent years, the industrial landscape has been undergoing a significant transformation, driven by the emergence of Industry 5.0. This new era of industrial development focuses on harmonising advanced technologies with human-centric approaches to achieve enhanced efficiency, productivity, and sustainability [1].

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Unlike its predecessor, Industry 4.0, which emphasized automation and data exchange in manufacturing technologies, Industry 5.0 brings a renewed focus on integrating human skills with cutting-edge technologies such as artificial intelligence, robotics, and the Internet of Things (IoT). This integration aims to create more adaptive, responsive, and sustainable industrial systems that prioritize human well-being and environmental stewardship [2].

Cultural values are an important aspect that may influence all aspects of human life activities, including Industry 5.0 readiness in terms of sustainability. Cultural values shape the perceptions and prioritize of societies, affecting how they approach sustainability in industrial practices. Therefore, understanding these values is crucial for effectively implementing Industry 5.0 initiatives that align with both human and environmental needs [3]. By fostering a deep consideration for cultural values, organizations can tailor their approaches to sustainability, ensuring that their initiatives resonate with local communities and promote long-lasting positive impacts. This alignment not only enhances the effectiveness of Industry 5.0 practices but also cultivates a sense of shared responsibility towards both economic and environmental well-being. This shared responsibility encourages collaboration among stakeholders, leading to innovative solutions that address pressing challenges in today's industrial landscape. Ultimately, by integrating cultural values into their sustainability efforts, organizations can drive a more inclusive and resilient transition towards Industry 5.0 [4].

A systematic literature review (SLR) was conducted to explore the development of sustainability guidelines for Industry 5.0, with particular focus on the influence of cultural factors and the various dimensions of existing models [5]. The purpose of this review is to provide a comprehensive analysis of how they affect Industry 5.0 readiness. It also offers insights into the role of cultural dynamics in shaping sustainable industrial practices. This study endeavors to identify critical factors by analyzing a variety of scholarly articles, case studies, and theoretical frameworks [6]

The significance of this study lies in its contribution to the growing body of knowledge on the interplay between cultural. Industrial culture greatly facilitates human access to activities that determine development [7].

The provide valuable recommendations for policymakers and culture. As industries worldwide strive to achieve sustainability goals, understanding the cultural dimensions of these efforts becomes increasingly vital [8]. This paper serves as a foundational resource for those seeking to navigate the complexities of Industry 5.0, offering insights that bridge the gap between technological innovation and cultural adaptability.

II. THEORETICAL BACKGROUND

Industry 5.0 represents a paradigm shift in industrial practices, evolving from the automation-centric approach of Industry 4.0 to a more integrative model that emphasizes human-centricity alongside technological advancements. Cultural factors such as values, beliefs, and norms influence organisational behavior, consumer preferences, and regulatory practices [9]. In different cultural contexts, sustainability goals and practices may be perceived and prioritized differently, affecting the overall effectiveness of sustainability initiatives. Thus, understanding these cultural dynamics is essential for designing and implementing effective sustainability guidelines [10]. Model dimensions refer to the various components or aspects of sustainability frameworks that are impacted by cultural factors. These dimensions include, but are not limited to, the economic, social, and environmental aspects of sustainability models.

This shift underscores the importance of embedding sustainability into industrial practices, with a focus on striking a balance between technological innovation, human well-being, and environmental stewardship. Sustainability Guidelines in Industry 5.0 aim to address environmental, social, and economic impacts while fostering a more inclusive and resilient industrial ecosystem. These guidelines encompass a variety of dimensions, including resource efficiency, waste reduction, social equity, and economic viability. As Industry 5.0 incorporates advanced technologies such as artificial intelligence, robotics, and the Internet of Things (IoT), it becomes crucial to adapt sustainability practices to this new context. Then, cultural influences play a significant role in shaping the development and implementation of sustainability practices.

Each dimension can be influenced by cultural considerations, which may affect how sustainability practices are adopted and operationalized within different cultural settings [11]. Systematic Literature Review (SLR) is a methodical approach to analysing existing research on a specific topic, allowing for the synthesis of findings from diverse sources. By conducting SLR, this study aims to collate and evaluate the body of knowledge related to sustainability guidelines in Industry 5.0, with a focus on cultural influences and model dimensions [12]. A complete explanation is presented in Table 1.

TABLE 1. SUSTAINABILITY GUIDELINES IN INDUSTRY 5.0, KEY DIMENSIONS AND CULTURAL INFLUENCE [13]

Main Dimension	Description	Sustainability Goal	Technological Influence	Cultural Influence
Economic	Enhancing cost-efficiency, creating new economic value, and supporting circular economy practices	Economic sustainability, profitability	IoT and AI for resource management	Perceptions of economic benefits and consumer preferences vary across cultures
Environmental	Minimizing environmental impact through emission reduction, energy efficiency, and waste management	Reducing carbon footprint, minimizing waste	IoT sensors and environmental data analytics	Societal values and beliefs influence the acceptance of environmentally sustainable practices
Social	Promoting workforce and community well-being, inclusivity, and social equity	Social equity, workforce well-being	Human-machine collaboration	Local social norms and regulations shape social justice practices, with diverse applications across countries
Sustainable Innovation	Supporting the creation of eco-friendly products and services	Innovative, sustainable, and environmentally friendly products	AI, additive manufacturing	Perceptions of sustainable innovation differ across cultures, with some more proactive in adopting new technologies
Systematic Literature	Compiling and evaluating sustainability findings in Industry 5.0 with a focus on cultural aspects	Comprehensive understanding of sustainability guidelines	Analytical literature review approach	Each culture plays a role in influencing the analysis and synthesis outcomes on this topic
Environmental-Cultural Model	Integrating environmental aspects with cultural awareness for sustainability	Reducing environmental impact through cultural values	Use of low-emission technology	Cultural awareness of environmental practices varies, impacting how these practices are adopted

Figure 1 below illustrates the contributions of Industry 5.0 sustainability and society. The focus of Industry 5.0 sustainability lies in human-centric design, technological integration, and resource efficiency, while the societal focus includes a human-centric approach, social inclusion, and equity, as well as digital ethics and trust. Industry 5.0 sustainability is driven by these elements, aiming to balance innovation with environmental responsibility. On the societal side, the focus expands to include human-centric approaches, social inclusion and equity, and digital ethics and trust, ensuring that technological advancements benefit all and uphold ethical standards [9]. Both domains are united by the principle of human centricity, placing people at the core of industrial and societal transformation [14].

III. RESEARCH QUESTIONS

In this paper, several questions should be focused on to provide a better understanding of the above theory.

1. What are the key dimensions of sustainability models in Industry 5.0 that are influenced by cultural factors? This question aims to identify and understand the various components of sustainability models that are affected by cultural contexts. It explores how different dimensions of sustainability are shaped by cultural influences [15].

2. How do cultural factors impact the development and implementation of sustainability guidelines in Industry 5.0? This question seeks to examine the specific ways in which cultural considerations influence the formulation and execution of sustainability guidelines [16]. It addresses the challenges and opportunities presented by cultural diversity in implementing sustainability practices.

3. What insights can be drawn from existing literature about the effectiveness of culturally informed sustainability guidelines in Industry 5.0? This question focuses on synthesising findings from existing research to evaluate how culturally adapted guidelines enhance the effectiveness of sustainability practices. It aims to provide practical recommendations based on empirical evidence [17]. How can sustainability guidelines be designed to accommodate diverse cultural contexts within the framework of Industry 5.0? This question explores strategies for developing flexible and adaptable sustainability guidelines that consider varying cultural contexts.

What are the implications of integrating cultural considerations into sustainability practices for achieving long-term sustainability goals in Industry 5.0? This question examines the broader implications of incorporating cultural factors into sustainability practices, with a focus on the potential impact on achieving long-term sustainability objectives within Industry 5.0 [18].

IV. METHODOLOGY

In conducting a systematic literature review (SLR) on "Sustainability Guidelines for Industry 5.0 Cultural Influences: A Systematic Literature Review of Model Dimensions," the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) methodology will be employed [19]. This approach ensures a rigorous and transparent review process, allows for the effective elucidation of existing research, and provides comprehensive insight into the impact of cultural factors on sustainability guidelines in the Industry 5.0 framework. This can be done with or without statistical procedures. This literature review has been designed in a structured and rigorous manner. It is replicable, so it can be updated in the future with the current findings on Industry 5.0 readiness. In this paper, this review technique helps explore the range of readiness models available with cultural sustainability decisions, and then narrows down the selection to just Industry 5.0 readiness models and Industry 5.0 readiness dimensions [20].

A systematic review is defined as a comprehensive and structured examination of a formulated question that uses
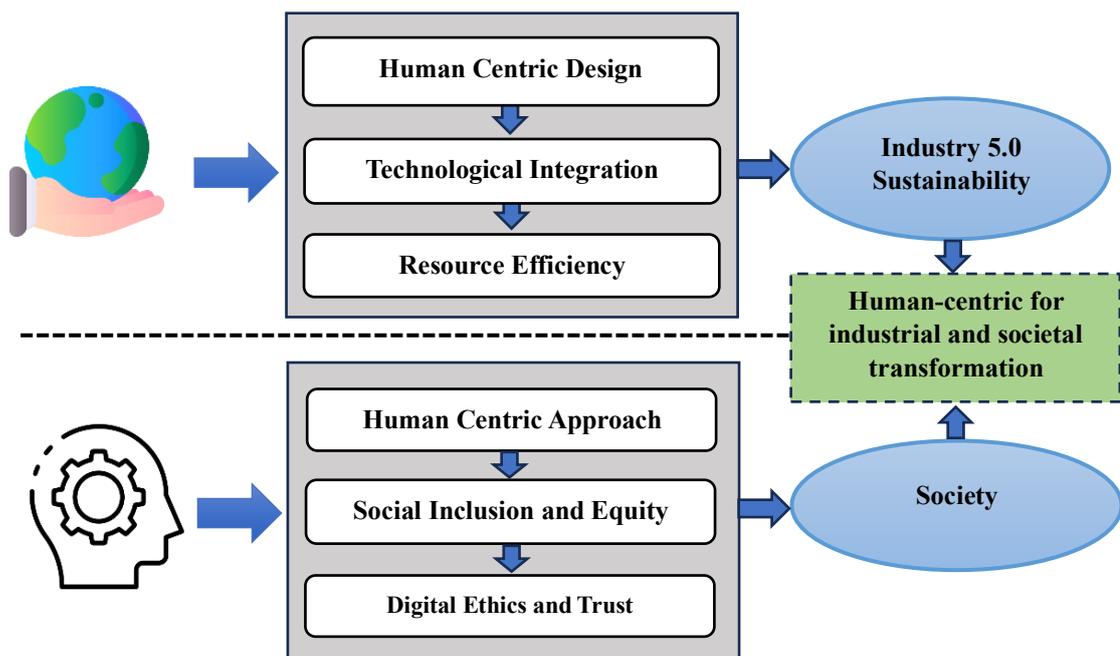

Fig 1. Contribution of Industry 5.0 Sustainability and Society

explicit, transparent methods to appraise research critically. A systematic review is a comprehensive examination of a formulated research question, employing explicit and structured methods to appraise and synthesize existing research critically. This approach can be executed with or without statistical procedures, depending on the nature of the data and the goals of the review [21]. Unlike traditional literature reviews, systematic reviews follow a rigorous methodology that is meticulously designed to minimize bias and ensure transparency. This involves a thorough search of relevant studies, assessment of their quality, and a synthesis of findings that provides a high-level overview of what is known about a particular subject [22].

This is particularly important in rapidly evolving fields such as Industry 5.0, where technological advancements and shifts in industrial practices necessitate continual reassessment of readiness and implementation strategies. By providing an updated and reliable evidence base, systematic reviews enable policymakers, researchers, and practitioners to make informed decisions that align with the latest developments and best practices [23].

The explanation begins with: Records identified through database searching (n=75), Additional records identified through other sources (n=60), Records after duplicates removed (n=15). The structured nature of systematic reviews makes them replicable and allows for future updates as new research emerges. This is particularly important in rapidly evolving fields such as Industry 5.0, where technological advancements and shifts in industrial practices necessitate continual reassessment of readiness and implementation strategies. Industry 4.0 focused primarily on automation and the integration of digital technologies to optimize production processes, but Industry 5.0 takes this a step further by emphasizing the collaboration between humans and machines to create a more sustainable and human-centric approach. This evolution requires not only technological readiness but also a cultural and organizational shift that embraces sustainability and human values [24].

Therefore, the methodology used in systematic reviews can have a significant impact by clearly elucidating complex concepts. Moreover, the systematic review process often involves collaboration among multiple researchers, adding a layer of expertise and credibility to the findings. This makes systematic reviews an invaluable tool for advancing our understanding of complex issues and informing evidence-based practice across various domains [25].

In short, these are strict selection criteria to ensure that only relevant and specific data related to measuring the impact of Industry 5.0 culture on sustainability is considered. This makes systematic reviews an invaluable tool for advancing our understanding of complex issues and informing evidence-based practice across various domains, as they enable researchers to move beyond fragmented findings and construct a more comprehensive body of knowledge. Through the integration of diverse perspectives and empirical evidence, systematic reviews uncover consistent patterns, expose research gaps, and identify methodological weaknesses that require further exploration [26]. In this sense, systematic reviews function as a bridge between theoretical development and practical application, providing policymakers, industry leaders, and scholars with a reliable foundation to strengthen decision-making processes, design innovative frameworks, and enhance sustainability strategies within the context of Industry 5.0 [27]. Furthermore, systematic reviews contribute to building cumulative scientific progress, where individual studies that may appear limited in scope or context are assembled into a coherent framework that highlights broader implications and long-term trajectories.

This process ensures that research does not remain isolated, but instead contributes to a collective understanding of cultural influences, human-centric innovation, and the integration of sustainability in industrial transformation. Beyond enriching theoretical frameworks, it establishes a knowledge ecosystem that highlights how cultural values shape organizational responses to technological change and sustainability demands [28]. By embedding cultural perspectives into industrial transformation, the outcomes of research become highly relevant for practical implementation, particularly within sectors such as manufacturing and logistics, where operational efficiency and adaptability are critical.

This alignment allows industries to not only adopt innovative technologies but also to integrate them in ways that respect cultural dynamics, strengthen workforce engagement, and ensure long-term sustainability [29]. For instance, in manufacturing, understanding cultural influences can improve collaboration between humans and machines, enhance training programs, and support sustainable product design that meets both global standards and local values. Similarly, in logistics, culturally informed innovation can improve supply chain transparency, reduce waste, and optimize resource allocation while fostering trust among stakeholders across different cultural settings [30]. From an academic perspective, this integrated approach expands the body of knowledge on Industry 5.0 by demonstrating how cultural dimensions interact with sustainability practices and technological adoption. It provides new theoretical insights into how organizations in diverse cultural contexts can navigate complex transformations without losing alignment with their social values. At the same time, the practical implications are evident in the development of more adaptable and resilient strategies, ensuring that sustainability is not treated as a separate initiative but as a core principle embedded in everyday industrial operations [31].

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Such guidelines not only emphasize technological integration and sustainability but also highlight the importance of cultural sensitivity and human-centric approaches [33]. Overall, the steps of the systematic methodology used in this review article are illustrated in Figure 2.
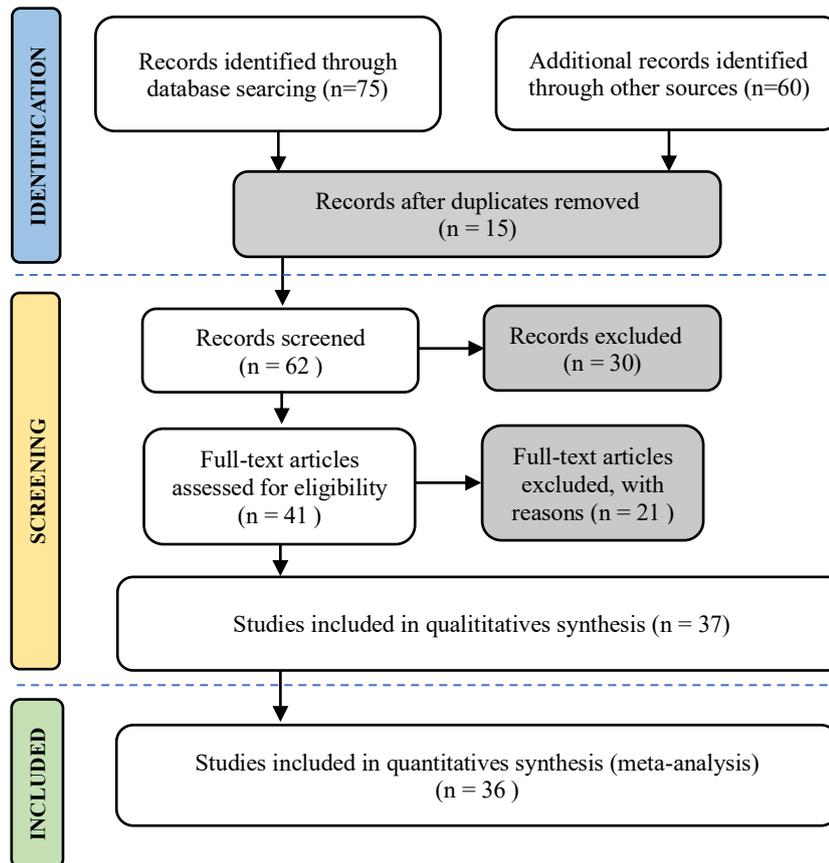
Fig 2. PRISMA flowchart

For data analysis, this methodology is further supported by content analysis, which is commonly used in the social sciences. Content analysis can be described as a systematic technique in which certain (coded) words in a text are grouped into categories. In this paper, themes were constructed based on common contexts and meanings, leading to the findings described in the next section [34]. A scan of existing literature on topics related to Sustainability Guidelines for Industry 5.0 Cultural Influences was conducted, which resulted in 75 articles, spanning the years 2019 to 2024, which will be viewed using the VOSviewer chart. Four search keywords were used, covering more than 10 publishers and databases, as shown in Table 2. Since most of the literature was available in English, this review tended to be comprehensive in terms of available literature. Secondly, magazine articles were considered less formal and lacked academic rigor; they were excluded from this review. However, industry reports and white papers from credible and reputable consulting firms were excluded from this review [35]. Credible and reputable consulting firms were considered. From the review of 75 screened full-text articles, 37 were qualitative and 36 were quantitative. There were two rounds of elimination conducted, following the PRISMA approach, which resulted in the 75 targeted articles that comprise this review. The first elimination round was based on sorting conceptual, theoretical, and empirical studies. The second elimination round was extensive based on full-text reading, retaining only literature based on the research objectives of the systematic review. Here, papers that did not provide Sustainability Guidelines for Industry 5.0 Cultural Influences questionnaire and model dimensions were excluded. In short, these are strict selection criteria to ensure that only relevant and specific data related to measuring the impact of Industry 5.0 culture on sustainability is considered [36]. Such criteria are designed to establish a transparent boundary between studies that provide substantial contributions to the research questions and those that only offer peripheral or tangential insights. This process not only strengthens the internal validity of the study but also ensures external relevance by focusing on cultural and industrial aspects that directly align with the objectives of Industry 5.0 readiness [37]. Furthermore, by filtering the sources in this way, the research avoids unnecessary bias, redundancy, and conceptual overlap, while simultaneously ensuring that the final synthesis reflects the most current and credible developments in the field. Ultimately, this comprehensive and disciplined approach allows the guidelines produced to be more robust, practically applicable, and culturally sensitive.

TABLE 2. SEARCH BOUNDARIES AND KEYWORDS

Search Limitation	*Google Scholar, Literary Databases, Emerald, JSTOR, MDPI, Sage, Research Gate, Science Direct, Wiley, Springer Link, EBSCO Host, Wiley, Industry Report, IEEE*
Keywords	*Industry 5.0, Sustainability Guidelines, Cultural Influences, Model Dimensions*

V. RESULTS

Following the research objectives of this review paper, a systematic literature review of 75 articles on Sustainability Guidelines for Industry 5.0 Cultural Influences highlighted two main findings: a list of existing Industry 5.0 sustainability guidelines and the identification of key dimensions of existing Industry 4.0 readiness models, and the identification of key dimensions of existing Industry 5.0 sustainability and cultural influences, and the identification of key dimensions of existing Industry 5.0 sustainability models. These two findings will be further explained in this section. The results are displayed in the form of Figure 3, that have been designed using VOSviewer [38]. It depicts the structure and key elements of this conceptual model, highlighting the interplay between cultural values, technology, and sustainability in Industry 5.0 [39]. In addition to thematic synthesis, this systematic literature review also incorporated a bibliometric analysis to gain deeper insights into the structure and development of research within the field of Industry 5.0 readiness, sustainability practices, and cultural influences [40]. By employing bibliometric techniques such as keyword co-occurrence, co-authorship network mapping, and citation analysis, this review aims to identify emerging research trends, collaborative dynamics, and influential contributions that have shaped the discourse. The summary of these bibliometric insights is presented in Table 3 and 4, titled Comparison Table Per Construct Between Industry 5.0 and Cultural Adaptability Year, which illustrates the relationship between Industry 5.0 readiness and the level of cultural adaptability at a specific point in time [41]. It presents the main constructs that serve as pillars of readiness for Industry 5.0 implementation, then compares them with dimensions of cultural adaptability to identify alignment, misalignment, or adaptation trends across countries or regions over a specific timeframe [42]. Accordingly, the methods used by previous researchers, as outlined in Table 3, were adapted to develop a conceptual model aimed at integrating Sustainability Guidelines for Industry 5.0 while considering cultural influences [43]. This conceptual model, which illustrates the incorporation of cultural values in the relationship between people and Industry 5.0, is shown in Figure 3. The model provides a framework for understanding how cultural values can be integrated into interactions between humans and technology, enhancing sustainability practices in the industry. By adapting and applying this model, the study aims to offer a detailed guide for incorporating cultural factors into sustainability practices, ensuring they are not only technically effective but also culturally sensitive [10]. This approach makes a significant contribution by enriching both academic literature and practical industrial solutions [32]. Academically, it provides a deeper understanding of how cultural factors influence the adoption and effectiveness of sustainability practices in Industry 5.0. In this context, the sustainability industry will support the identification of technological development and the results from previous research [44]. The evaluation of technological readiness enables organizations to systematically understand, measure, and improve their preparedness for Industry 5.0 transformation [45]. At the initial stage, data collected through the application is processed into measurable constructs, ensuring that cultural influences, sustainability dimensions, and organizational capabilities are accurately reflected in the model. This data is then assessed for validity and reliability, guaranteeing that each construct represents a trustworthy measurement of technological readiness [46]

Fig 3. VOSviewer Analysis

TABLE 3. TYPES OF BIBLIOMETRIC ANALYSIS AND KEY INSIGHTS

Analysis Type	Key Insights	Example Findings
Keyword Co-Occurrence	Identifies major research themes and trends	Clusters of keywords like "Industry 5.0," "sustainability," and "cultural influences"
Co-Authorship Networks	Reveals collaboration patterns and influential researchers	Central authors and institutions with high collaboration rates
Citation Analysis	Highlights significant studies and publication impact	Highly cited studies and influential journals

TABLE 4. COMPARISON TABLE PER CONSTRUCT BETWEEN INDUSTRY 5.0 AND CULTURAL ADAPTABILITY YEAR

Year	Technological Integration	Sustainability Practices	Human-Centric Innovation	Cultural Adaptability	Workforce Competence
2018	8	2	1	1	0
2019	10	4	1	1	1
2020	9	6	2	3	2
2021	7	8	4	4	4
2022	6	9	6	5	5
2023	5	8	7	4	6
2024	4	6	8	4	7
2025	3	4	8	3	6

In a systematic literature review on "Sustainability Guidelines for the Cultural Influence of Industry 5.0," VOSviewer was used to analyze and visualize the research landscape. This analysis mainly focused on keyword co-occurrence, co-authorship networks, and citation patterns. By mapping the co-occurrence of keywords, it identified key themes and trends in the literature, revealing how concepts such as "Industry 5.0," "sustainability," and "cultural influence" are interconnected. These visualizations highlight key research areas and emerging trends, providing insight into the main focus of current studies [47].

Co-authorship analysis using VOSviewer helps understand collaboration patterns among researchers in the field. The network visualization shows which authors often work together and identifies influential contributors to the study of sustainability in Industry 5.0. This aspect of the analysis not only highlights leading researchers but also illustrates the collaborative nature of the research community, facilitating connections and identifying key institutions involved in this domain. Citation analysis provides insight into the impact and influence of specific studies [48]. The citation network is examined to identify highly cited works and to evaluate their importance within the field. This analysis reveals the most influential studies and journals, offering a perspective on how knowledge and research findings evolve over time. Overall, the VOSviewer analysis provides a comprehensive view of the research landscape, highlighting key themes, influential researchers, and key studies in the field of sustainability guidelines for Industry 5.0. This review brought together 42 studies that specifically discuss Industry 5.0 readiness with a focus on sustainability practices and cultural influences. From these works, three main themes emerged. The first is technological readiness, which highlights the role of tools such as artificial intelligence, the cultural values [49].

Internet of Things, and human–machine collaboration in supporting sustainability. The second is organizational and managerial readiness, where leadership, workforce competence, and innovation strategies appear as key drivers. The third is cultural influences, which emphasize how values like collectivism, long-term orientation, and uncertainty avoidance guide organizations in shaping their sustainability agenda. When comparing across contexts, developed countries tend to excel in technological integration and structured management systems, while developing countries show stronger sensitivity to cultural adaptation and workforce engagement [50].

To deepen the findings, a bibliometric and citation analysis was also carried out using VOSviewer. The collaboration map shows that research in this field is highly interconnected, with many institutions and researchers working together across countries. This collaboration not only strengthens knowledge exchange but also speeds up the spread of new ideas on how sustainability and Industry 5.0 can be aligned. Citation analysis then points to several highly influential works, many of which focus on sustainable product design, environmental impact assessment, and cultural dimensions in organizational change. These studies are widely referenced and serve as important starting points for future research and industrial application. The visualization further highlights clusters of recurring themes, including energy management, waste reduction, leadership, workforce competence, and cultural adaptation. These themes confirm that readiness for Industry 5.0 is not just about having the latest technology it requires balanced attention to organizational strategies and cultural responsiveness as well [51].

Altogether, the results provide a holistic view of the field. They show the topics that dominate the conversation, the differences between developed and developing countries, and the researchers and journals that have had the greatest impact. Most importantly, the findings underline that achieving Industry 5.0 readiness for sustainability will only be

successful when technology, management, and culture are allowed to work hand in hand. The comparison of Industry 5.0 readiness themes across different country contexts highlights clear distinctions between developed and developing countries. As illustrated in Figure 4, "Industry 5.0 Readiness Themes: Developed vs Developing Countries", developed countries demonstrate stronger readiness in technological and organizational aspects, reflecting their advanced infrastructure and managerial systems. In contrast, developing countries show higher emphasis on cultural influences, suggesting that local values and social dynamics play a more prominent role in shaping sustainability practices within Industry 5.0 frameworks.
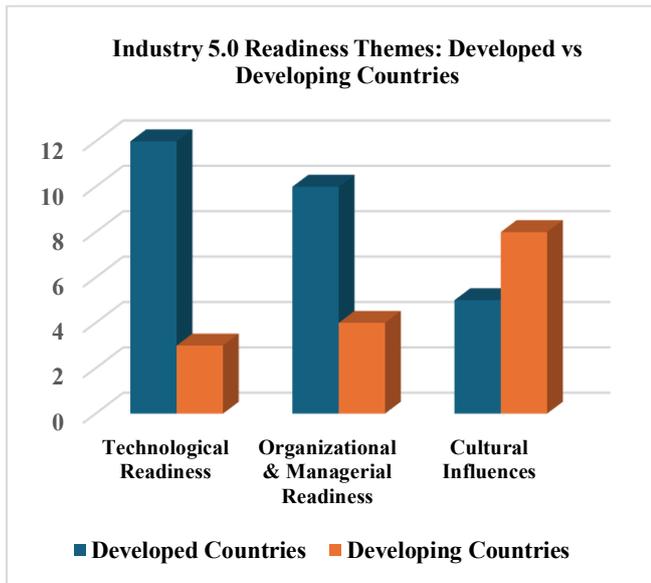
Fig 4. Industry 5.0 Readiness Themes: Developed vs Developing Countries

Figure 4 illustrates the varying readiness for Industry 5.0 across developed and developing countries. It highlights that developed countries are ahead in both technological and organizational readiness, supported by stronger digital infrastructure and well-established management systems [52]. On the other hand, developing countries still face challenges in these areas, as reflected in their lower numbers. What stands out is the role of cultural influences. Developing countries report more studies in this theme compared to developed ones, suggesting that cultural values and community dynamics carry significant weight in shaping sustainability practices. This indicates that while developed countries tend to lead the way with technological advancements and organizational strength, developing countries contribute a valuable cultural perspective. Together, these differences provide a more comprehensive understanding of how Industry 5.0 readiness evolves across diverse contexts.

VI. DISCUSSION

As mentioned in the introduction, the three research questions served as the foundation for the conception of this review paper. These three questions will be discussed in the same sequence as this section [53]. Research Question 1: What are the existing sustainability guidelines for Industry 5.0 (academia/industry), and how do cultural influences affect these guidelines?

Most sustainability guidelines for Industry 5.0 are proprietary and protected by consultancy firms, making them difficult to identify and evaluate openly [51]. One way to identify these guidelines is to examine their purposes, which can be descriptive, prescriptive, or comparative. It is also crucial to identify the intended target users of these guidelines [54].

Previous research indicates that some guidelines do not fully meet the needs or could be further developed to address sustainability challenges in Industry 5.0. This paper identifies various existing sustainability guidelines adapted to specific cultural contexts. Cultural influences often play a key role in determining the success of sustainability initiatives. The systematic literature review has identified various guidelines adapted to specific cultural contexts [55].

To complement the thematic synthesis of the literature, a longitudinal trend analysis was conducted to explore how key Industry 5.0 readiness factors have evolved over time. This analysis focused on the frequency of studies addressing specific readiness dimensions such as technological integration, sustainability practices, human-centric innovation, cultural adaptability, and workforce competence across the period from 2018 to 2025. The purpose of this analysis is to illustrate the shifting emphasize of scholarly attention in response to global industrial prioritize and socio-cultural dynamics. Major trends include: (a) annual developments and (b) the academia-industry divide. Early guidelines were more comprehensive, while recent models are more specific and culturally adapted. Academic guidelines are often more structured, while industry guidelines are more practical and application-focused. Table 1 provides a complete overview of the existing sustainability guidelines and relevant cultural influences.

Research Question 2: What are the main dimensions in sustainability guidelines for Industry 5.0 influenced by culture?

The thematic analysis of sustainability guidelines for Industry 5.0 reveals that each guideline has distinct characteristics based on cultural influence. The primary objective of these guidelines is to establish a starting point and design a development plan tailored to specific cultural contexts. Variations in dimensions reflect the complexity of cultural interactions with sustainability. Based on the literature review, several common dimensions include: (a) Technology, (b) Social Well-being, (c) Business Strategy, (d) Leadership, (e) Process, and (f) Innovation. These dimensions vary based on cultural context, such as prioritizing Social Well-being in some cultures. The review identified a total of 120 individual dimensions, which were grouped into six main dimensions. These findings guide organizations in evaluating and adapting sustainability guidelines according to their cultural contexts [56].

Research Question 3: Is 'Technology' the most significant dimension among the existing sustainability guidelines for Industry 5.0 [57].

The shift towards Industry 5.0 is characterized by the adoption of advanced technologies combined with human-centric approaches. Although technology is a primary driver, cultural influences also play a significant role. Previous research suggests that technology is often considered the most significant dimension in sustainability guidelines, but cultural impact is also essential. The analysis of existing guidelines found that out of 120 individual dimensions, 55 dimensions (46%) are related to technology. Technology dimensions include aspects such as digital infrastructure, technology readiness, digital applications, and technology innovation. However, cultural influences also affect how these technology dimensions are implemented and prioritized in sustainability guidelines. These findings emphasize the need for policies and strategies that consider both technological advancements and cultural contexts to achieve optimal sustainability outcomes [58].

Based on the 75 articles analyzed in this systematic literature review, various sustainability guidelines for Industry 5.0 influenced by culture have been identified. Most of these guidelines are often considered intellectual property and are not available openly, making them difficult to identify and evaluate. Sustainability guidelines can have descriptive, prescriptive, or comparative objectives, and it is crucial to identify the target users of these guidelines. This study identifies the existing sustainability guidelines and how they are adapted according to specific cultural contexts. Cultural influences play a significant role in determining the effectiveness of these guidelines. The findings from this literature review highlight two major trends in the development of guidelines: (a) annual developments and (b) differences between academic and industry contributions. Early guidelines tend to be more general and broad, while more recent models are more specific and tailored to particular cultural contexts. Academic guidelines are often more structured, whereas industry guidelines are more practical and applicable. According to findings from previous research, it has been discovered that building Sustainability Guidelines for Industry 5.0 Cultural Influences can be achieved by analyzing the elements that influence decisions and ranking them accordingly. Analyzing the elements that influence decision-making and ranking the importance of various characteristics in descending order [59]. Table 4 provides a summary of the different methods used in previous research, Table 5 shows the ways that previous studies tried to find out Sustainability Guidelines for Industry 5.0 Cultural Influence, refer to the various scientific approaches employed by earlier researchers to identify, develop, and formulate sustainability guidelines within the context of Industry 5.0, taking cultural influences into account.

The researchers in this study observed that cultural values are not yet clearly defined within the context of Industry 5.0. By analyzing cultural dimensions such as social norms, values, and regulatory expectations, this research highlights the importance of aligning technological advancements with human-centric values. This alignment ensures that technology not only optimizes processes but also respects the socio-cultural contexts in which industries operate [60].

The following Figure 5 illustrates a visual representation of these trends.
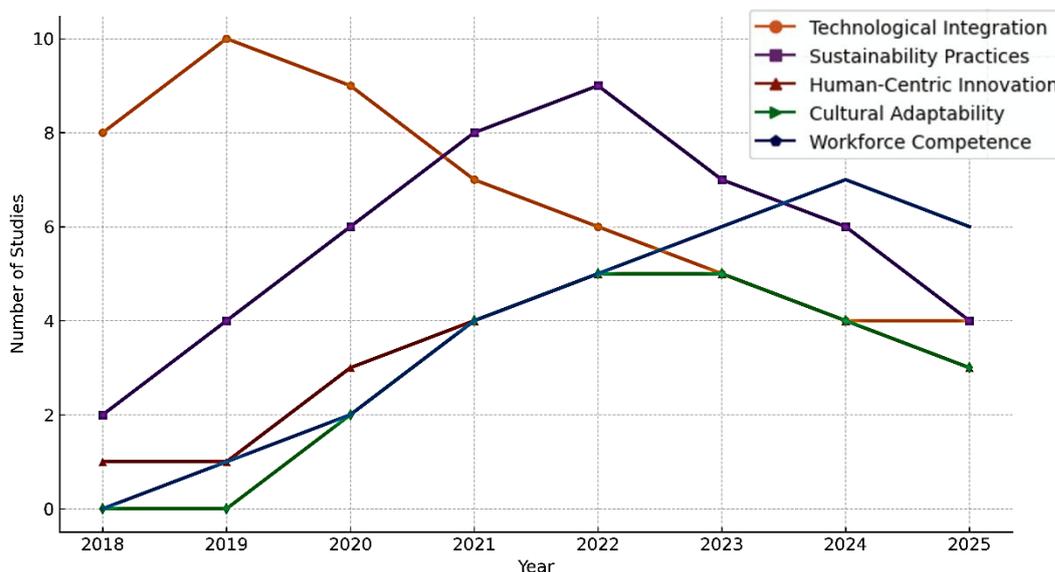

Fig 5. Trend of Industry 5.0 Readiness Factors (2018-2025)

TABLE 5. THE WAYS THAT PREVIOUS STUDIES TRIED TO FIND OUT SUSTAINABILITY GUIDELINES FOR INDUSTRY 5.0 CULTURAL INFLUENCE

Approaches	Description
Qualitative Case Study	Examine cultural influences on sustainability practices for locally appropriate guidelines.
Survey and Questionnaire	Measuring stakeholder perceptions and prioritize towards sustainability and cultural influences in Industry 5.0.

Practically, these insights bridge the gap between culture and technology, creating a more holistic framework for industrial innovation. The guidelines developed can help industries adopt sustainability practices that are both technologically advanced and culturally relevant. This approach ensures that Industry 5.0 not only improves operational efficiency but also fosters inclusivity, environmental stewardship, and economic viability. By embedding these principles, industries can navigate the complexities of diverse markets, enhance stakeholder relationships, and achieve long-term sustainability goals tailored to the unique cultural contexts in which they operate. This dual contribution merging theoretical insights with actionable strategies creates a resilient pathway for industries aiming to lead in a culturally-aware, sustainable, and technologically advanced industrial era [61].

Figure 6 presents a conceptual framework for engaging people, technology, and cultural influences in the Sustainability Guidelines for Industry 5.0. It serves as an integrated model that connects human-centric innovation, advanced technologies, and socio-cultural contexts to support sustainable industrial transformation. This framework emphasizes the synergy between workforce competence, ethical leadership, and digital integration (such as AI, IoT, and robotics), while also recognizing that cultural dimensions such as power distance, uncertainty avoidance, and long-term orientation shape how these elements are adopted and adapted across different regions. By aligning technological advancements with human values and cultural adaptability, the framework aims to create inclusive, context-aware sustainability strategies that enhance the effectiveness and acceptance of Industry 5.0 practices globally.

VII. CONCLUSION

The systematic review of 75 articles provides an extensive and detailed examination of sustainability guidelines within the context of Industry 5.0, with a focused emphasize on the impact of cultural factors. This substantial body of research encompasses a diverse array of perspectives and methodologies, providing a comprehensive overview of how cultural contexts shape and influence the development and implementation of sustainability practices in Industry 5.0. The review incorporates findings from a diverse range of sources, highlighting the multifaceted ways in which cultural considerations affect the formulation, execution, and effectiveness of sustainability guidelines. The breadth of the articles included ensures a robust and well-rounded analysis, revealing that cultural factors play a crucial role in tailoring sustainability guidelines to meet specific contextual needs. This review illustrates that a standardized approach is often inadequate for addressing the diverse cultural dimensions that influence sustainability practices. Instead, it highlights the need to tailor guidelines to specific cultural contexts to achieve optimal outcomes. Each article offers unique insights into how cultural influences can either enhance or impede the success of sustainability initiatives, underscoring the importance of culturally informed strategies. Overall, the review makes a significant contribution to understanding the intersection of sustainability and cultural factors within Industry 5.0. It offers valuable perspectives for policymakers, practitioners, and researchers who are engaged in developing and implementing sustainability strategies that are not only effective but also culturally relevant. This comprehensive analysis reflects the current state of knowledge. It highlights the need for context-specific approaches to sustainability in Industry 5.0, ensuring that strategies are both practical and aligned with cultural expectations and norms.
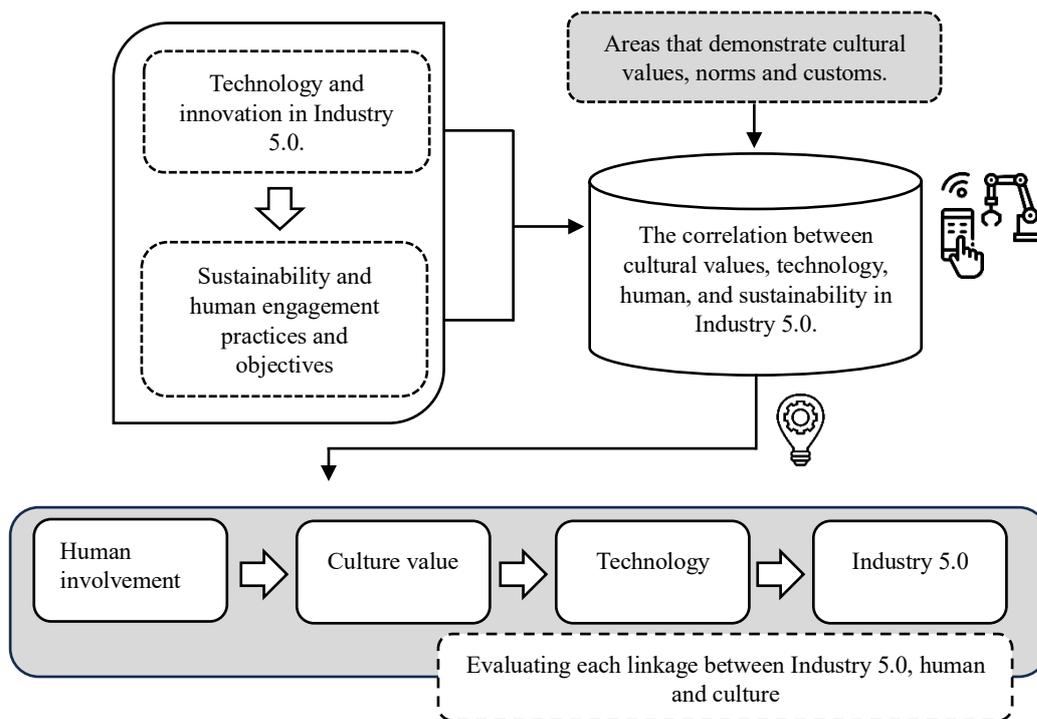
Fig 6. A conceptual framework for engaging people, technology and cultural influences in the sustainability guidelines for Industry 5.0 readiness.

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