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A systematic literature review on emerging technology risks in Industry 4.0/5.0: identification, clustering and developing mitigation strategies

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ABSTRACT: This systematic literature review comprehensively assesses the risks associated with implementing Industry 4.0/5.0 technologies. It clusters these risks into six groups (strategic, financial, operational, technological, environmental, and sociocultural). Using a PRISMA-guided approach, the analysis of 83 peer-reviewed papers identified 36 unique risks out of a total of 811. The findings reveal critical challenges, including in cybersecurity threats, financial burdens, technological obsolescence, and workforce adaptation. These results provide a structured risk categorization that can assist enterprises, in effectively mitigating risks and aligning their strategies with Industry 4.0/5.0 transitions. This framework closes knowledge gaps and offers actionable insights for a robust and sustainable implementation.

KEYWORDS: risk management, decision making, entrepreneurship, strategc risk cluster and mitigation, resilience strategies

1. Introduction

The COVID-19 pandemic has put the global economy under significant stress, imposing a renewed need for an increase in enterprises' agility and developing resilient strategies to manage global crises (Camarinha-Matos et al., 2022; Dwyer Bricklin, 2021; Miahkykh et al., 2024). Industry 4.0 and 5.0 technologies present both opportunities and challenges in this transformation. While innovation is crucial for maintaining competitiveness, effective risk management is equally important to ensure organizations can navigate uncertainties, optimize resource allocation, and enhance resilience (Miahkykh et al., 2024). 80 percent of experts interviewed in a recent study emphasized the growing importance of innovation as a key factor in competitiveness, which underlines the need for effective risk management, especially within the transformation towards Industry 4.0/5.0 technologies (Miahkykh et al., 2024). Despite the growing importance of these technologies, existing literature lacks a structured risk assessment framework for Industry 4.0/5.0 technologies adoptions. Studies emphasises the importance of change management in technological transitions (By, 2005; Sonar et al., 2021), yet the interconnection between risk management, change management and business resilience remains underexplored. Additionally, the application of VUCA (Volatility, Uncertainty, Complexity, Ambiguity) and BANI (Brittle, Anxious, Nonlinear, Incomprehensible) frameworks provides valuable insights into the dynamic nature of transformation, highlighting the need for comprehensive risk mitigation strategies. Especially in context of transforming processes, studies revealed that an inadequate attention to adequate implementation of risk management strategies will likely lead to projects failure (Araújo et al., 2021; Götze et al., 2015; Humphries et al., 2024).

As organisations struggle to align their processes with Industry 4.0/5.0 standards (Karevska et al., 2019), this paper aims to answer: *What are the key risks associated with implementing Industry 4.0/5.0 technologies and how can they be systematically categorized to support risk mitigation?* Industry 4.0 technologies can be summarized into ten main interconnecting pillars: **(1)** Big Data Analytics;

(2) Internet of Things (IoT); **(3)** Autonomous robots **(4)** Simulation; **(5)** Augmented reality; **(6)** Additive manufacturing; **(7)** Cloud computing; **(8)** Cyber security; **(9)** Horizontal & vertical integration; **(10)** other enabling technologies (Butt, 2020). Although digitalization, automation and connectivity are core principles of industry 4.0 (Despeisse et al., 2017), Industry 5.0 builds upon these principles, incorporating sustainability, human-centric approaches and resilience (Innovation et al., 2021), including the introduction of a broader field of digital features (for example predictive maintenance, hyper-customization, cyber-physical cognitive systems, collaborative robots and smart additive manufacturing) (Khan et al., 2023). Adopting Industry 4.0/5.0 require strategic change management to ensure that organizations can align their workforce, operational processes and business models with the evolving technological landscape (Errida & Lotfi, 2021). Common models such as *"Kotter's 8-steps", "Mento et al.'s 12-steps"; "Cummings and Worley 5-steps"; "Lücke's 7-steps"; "Kanter et al.'s 10-steps"; "McKinsey's 7-s";* and other processual and descriptive models (By, 2005; Errida & Lotfi, 2021; Miller, 2020) provide comprehensive insights into managing technological transitions, yet they often lack a risk-focused approach specific to Industry 4.0/5.0 adoption. Furthermore, a two-year case study conducted in the construction sector (Errida & Lotfi, 2021) highlights the practical challenges of integrating digital tools such as ERP and BIM software, emphasizing critical factors such as leadership, resilience management and continuous monitoring. While BIM (Building Information Modelling) enhances collaborative workflows, real-time assessment and predictive analytics, its implementation presents unique challenges such as interoperability issues, data security concerns and resistance from traditional construction stakeholders. These risks underline the necessity of structured digital adoption frameworks that account for both technological and sociocultural factors. While existing literature provides insights into change management strategies, it lacks a comprehensive focus on the interconnected technological, operational and strategic risks occurred by Industry 4.0/5.0 adoption.

2. Literature review scope and methodology

The literature review presented here was conducted following the Cochrane framework, which is a structured methodology designed to create high quality and evidence-based research by emphasizing a transparent and replicable process for assessing studies (Higgins et al., 2019). The guidelines for "preferred reporting items for systematic reviews and meta-analyses" (short PRISMA) are used to describe the selection process (Page et al., 2021).

The purpose of this systematic literature is to strengthen implementation projects robustness and supporting especially small and medium sized enterprises in adopting emerging technologies in the context of Industry 4.0/5.0. Furthermore, this review identifies a knowledge gap between current practice and literature regarding risk assessment in implementing Industry 4.0/5.0 technologies. Therefore, the central research question **(RQ)** to be answered is: *"What risks arises when implementing new Industry 4.0/5.0 technologies and how can such risks be categorised?"*

The used databases are SCOPUS and Web of Science, employing the following search strings:

- **SCOPUS:** *("Industry 4.0" OR "Industry 5.0") AND ("risks" OR "risk assessment" OR "risk management" OR "enterprise risk management" OR "Implementation risks" OR "technology adoption risks" OR "risk clustering") AND PUBYEAR > 2009 AND PUBYEAR < 2026 AND (LIMIT-TO (DOCTYPE , "ar") OR LIMIT-TO (DOCTYPE , "cp") OR LIMIT-TO (DOCTYPE , "re")) AND (LIMIT-TO (LANGUAGE , "English") OR LIMIT-TO (LANGUAGE , "German")).*
- **WEB of Science:** *TS=("Industry 4.0" OR "Industry 5.0") AND TS=("risks" OR "risk assessment" OR "risk management" OR "enterprise risk management" OR "Implementation risks" OR "technology adoption risks" OR "risk clustering") AND PY=(2010-2025) AND (DT=("ARTICLE") OR DT=("CONFERENCE PAPER") OR DT=("REVIEW")) AND (LA=("English") OR LA=("German")).*

Included literature are studies published after 2010 to ensure relevance. Moreover, selected articles are published in the top quartiles (Q1) of peer-reviewed journals and contain primary empirical data on Industry 4.0/5.0 implementation risks to ensure the highest possible quality. Another eligibility criteria was that only studies in English or German are included to permit the research team a first-hand analysis, with no restrictions based on region or organisation type to ensure a global perspective. The search strategy focuses on search terms that include "Industry 4.0 OR Industry 5.0 AND risks" and other risk-related keywords, while specific technology terms (e.g. IoT, AI) are excluded, as they are considered part of Industry 4.0/5.0. The

applied filters are publication dates from 2010 onward, document types including articles, conference papers, and reviews. Unreported information from studies (e.g. industry sector, geographical region, organisation size, etc.) are extrapolated where possible and handled with risk bias assessment according to Cochrane RoB 2 tool. The screening process revealed an initial pool of 38,244 papers which could be reduced furthermore as duplicates and those without DOI numbers are removed to ensure the repeatability of the literature review and the retrievability of the included papers. After refining the search scope (such as title, abstract, keyword) and focusing on papers with higher citation records (above 3 between years 2010–2021), and higher impact level for articles (only Q1; identified with *SCIMAGO*), the selection narrowed to 1,296. Final exclusion criteria applied for redundancy and narrow focus, such as topics outside Industry 4.0/5.0 implementation, revealed a final selection of 83 included papers (47 articles, 18 conference papers and 18 reviews). Despite the possibility of missing relevant publications due to the highly selective process, the confidence in the findings remains high.

3. Risks associated with implementation of emerging technologies

The systematic literature review of the 83 papers revealed a total of 811 risks. In order to make the analysis effective, these risks were consolidated into 36 individual risks through a thematic clustering approach. This process involved: (1) Identifying duplicate or overlapping risks across multiple sources (2) Group similar risks under broader categories (e.g. different cybersecurity risks under technological risks) and (3) validating cluster consistency with existing frameworks (such as (Gabriel et al., 2021; Herceg et al., 2020))

3.1. Risk categories

These risks can be clustered into 6 main groups based on an intersection of frequently named groups (such as by (Gabriel et al., 2021; Herceg et al., 2020; Miahkykh et al., 2024)):

1) **Strategic risks** involve the broader/long-term challenges that organisations face when attempting to align their strategic vision/roadmap with the fast-pacing development of industry 4.0/5.0 technologies and uncertainties of external market forces (e.g. risks related to decision making processes and market positioning).
2) **Financial risks** in the context of Industry 4.0/5.0 technology implementation encompasses financial uncertainties and potential losses such as high capital investments and challenges of securing adequate funding. These risks arise from external economic factors (e.g. currency fluctuations, or market) as well internal inefficiencies (e.g. integration failures, or financial burdens of mitigating).
3) **Operational risks** encompass disruptions and inefficiencies arising from technological obsolescence, inadequate integration of digital systems, and data security vulnerabilities. These risks are merged by scalability challenges, workforce skill gaps, and the complexities of automated decision-making processes, all of which can hinder operational performance and productivity.
4) **Technological risks** pertain to the integration, performance and security of (advanced) Industry 4.0/5.0 technologies that create potential challenges and vulnerabilities (such as cybersecurity threats where the risk of data breaches and unauthorized access occur).
5) **Environmental risks** focus on ecological impacts due to increased resource consumption, energy requirements or waste generation associated with Industry 4.0/5.0 technologies. The pressure to adapt to evolving environmental regulations and societal expectations of sustainability can require operational adjustments and investments that assume environmental risks.
6) **Sociocultural risks** encompass cultural, ethical and social impacts are encompassed by sociocultural risks. These risks include resistance to organizational change, increased employee stress, and concerns about ethical issues such as transparency and fairness. All of these can negatively impact the successful adoption and integration of new technologies.

Unlike traditional risk frameworks these categories reflect Industry 4.0/5.0 specific challenges from a global perspective. For example, technological risks in Industry 4.0/5.0 are not just about systems failures but also include AI biases, cyber-physical system vulnerabilities and interoperability concerns. Similarly, sociocultural risks have gained importance due to Industry 5.0's emphasis on human-centredness, workforce adaption and ethical AI development. Figure 1 shows the distribution of identified risks grouped into the six main groups. The left spider web diagram shows the distribution of

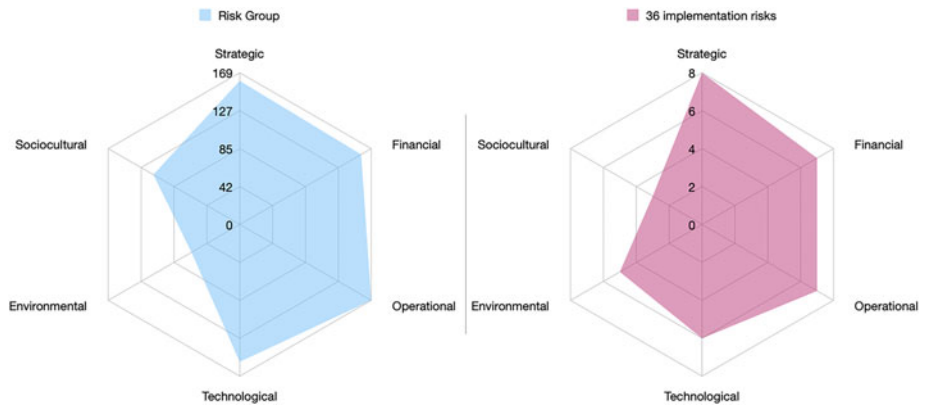

Figure 1. Identified risk distribution (l: absolute total; r: adjusted/unique total)

the total number of identified risks (811) of each paper, while the right shows the consolidated individual identified risks. For instance, 160 strategic risks have been identified in the 83 papers (Figure 1, left diagram). After grouping duplicates together, eight individual strategic risks are mentioned throughout the 83 papers (Figure 1, right diagram). Consequently, overall (Figure 1, left diagram) strategic, financial, operational, and technological risks have been frequently mentioned in this literature review, while sociocultural and environmental risks remain less prominent. This demonstrates the extent to which the review addresses each risk group and, therefore, sets its importance. Figure 1 (right diagram) instead illustrates the number of individual risks associated with each group that the review uncovered. The 160 strategic risks identified a total of eight unique risks, whereas the less discussed sociocultural risks (111 risks) revealed only three unique risks. Overlapping this information illustrates the frequency with which risk groups have been mentioned in the literature review, enabling the identification of areas where enterprises should prioritize their efforts. This is also evident in the dimensions of the 36 unique risks depicted in Figure 2, specifically the outer wheel.

3.2. Definition of implementation risks of Industry 4.0/5.0 technologies

Figure 2 shows the 36 identified unique risks based on the distribution of the risk groups [inner wheel: strategic- (20 % | 160 risks), financial- (19 % | 156 risks), operational- (21 % | 169 risks), technical risks (19 % | 153 risks), environmental- (8 % | 62 risks), sociocultural risks (14 % | 111 risks)]. As Figure 2 (r.) and the outer wheel shows the number of unique risks of each group, strategic- (8 risks), financial- (7 risks), operational- (7 risks), technical risks (6 risks), environmental- (5 risks), sociocultural risks (3 risks). Table 1 describes each of the risks in detail.

In a nutshell, this table shows critical risks associated with implementing Industry 4.0/5.0 technologies. Beside the six main risk groups, the table shows and explains the 36 unique risks. Strategic risks

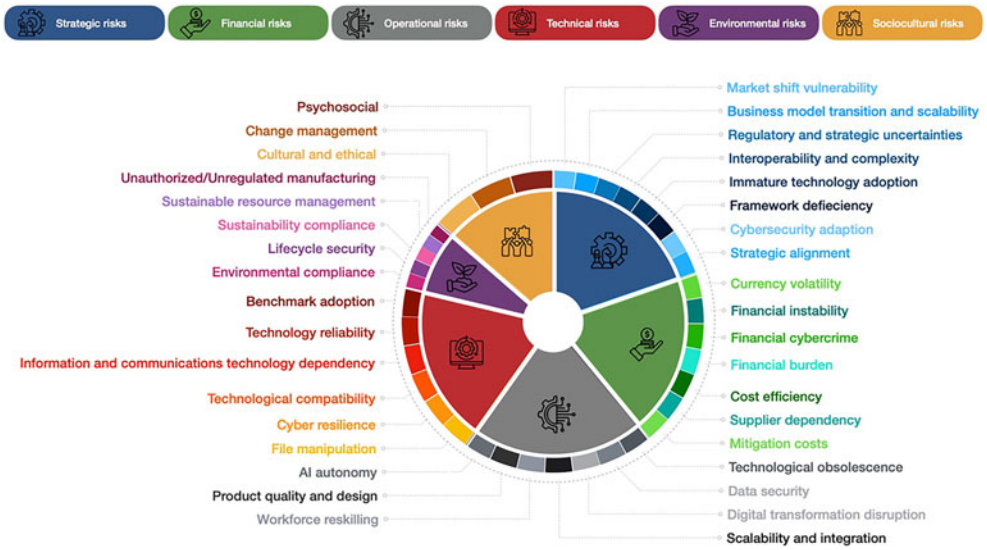

Figure 2. Implementation risks of Industry 4.0/5.0 technologies

Table 1. Description of implementation risks for Industry 4.0/5.0 technologies

(1) Strategic risks	
1.1 Market shift vulnerability	Global market dynamics and vulnerable supply chains amplified by external disruptions and high costs of technology access lead to a risk to market structure changes (Miahkykh et al., 2024; Rodríguez-Espíndola et al., 2022).
1.2 Business model transition and scalability	Enterprises may struggle with restructuring to integrate decentralized, data-driven business models. Scalability challenges arise with rising costs if the transition is not managed well (Ghadimi et al., 2022).
1.3 Regulatory and strategic uncertainties	Uncertainties in tax policies, political instability, weak regulatory standards, and especially lack of standards and frameworks create strategic risks for companies, particularly SMEs, in adopting new technologies (Miahkykh et al., 2024).
1.4 Interoperability and complexity	The integration into existing systems increases the complexity of the business model and seamless communication across platforms as current infrastructure may not be technology mature (Abedsoltan et al., 2024; Patel et al., 2024).
1.5 Immature technology adoption	The rapid technological development can result in the premature adoption of immature technologies, such as quantum computing and AI, leading to costly failures or frequent overhauls due to low technological maturity (How & Cheah, 2024).
1.6 Framework deficiency	The lack of systematic integration between circular economy principles and advanced digital technologies, along with inadequate risk management frameworks, leads to misaligning technological capabilities within organisational goals (Taddei et al., 2024).
1.7 Cybersecurity adaption	The risk of new and unexpected cyber threats emerges at implementing new digital technology into existing infrastructure. This can include loss of intellectual property or potential reputational damager (Zimmermann et al., 2019).
1.8 Strategic alignment	The lack of strategic alignment and mitigation strategies lead to inefficient outcomes, strategic missteps and difficulties in balancing technological, economic, and societal factors, ultimately hindering effective decision-making and market positioning (Bookbinder et al., 2024).
(2) Financial risks	
2.1 Currency volatility	Risks of reduced profitability and expenses of international operations arises due to fluctuations in exchange rates and transaction costs of international enterprises (Miahkykh et al., 2024).
2.2 Financial instability	Risk of financial instability arises due to an increased debt burden or inefficient financing methods (Miahkykh et al., 2024).
2.3 Financial cybercrime	Cyberattacks in Industry 4.0/5.0 can result in substantial financial losses. Not only from direct theft or damage but also from the costs of addressing vulnerabilities, lost revenue due to downtime, and the increased risks of cybercrimes like digital payment fraud (Patel et al., 2024).
2.4 Financial burden	High upfront costs, expenses related to training and infrastructure upgrades, potential integration failures, and ongoing costs from technological obsolescence presents significant financial risks - particularly for SMEs (Bookbinder et al., 2024; How & Cheah, 2024; Taddei et al., 2024).
2.5 Cost efficiency	Financial miscalculation or the failure of achieving economies of scale may lead to increased costs per unit (Trzaska & Sus, 2023).
2.6 Supplier dependency	Changes on supplier dynamics presents a financial risk, as the reliance in suppliers' technological capabilities is crucial (Pandey et al., 2023).
2.7 Mitigation costs	Mitigation costs include cost of managing new risks that arises on implementing industry 4.0/5.0 technologies (through training, protective measures, update safety protocols, and investments in legal infrastructure) (Arana-Landín et al., 2023).

(*Continued*)

Table 1. Continued.

(3) Operational risks	
3.1 Technological obsolescence	Rapid technological advancements increase the risk of obsolescence, as existing solutions quickly become outdated, requiring ongoing updates and additional investments (Miahkykh et al., 2024).
3.2 Data security	Disclosure of confidential information and cyberattacks can lead to competitive disadvantages, with additional challenges arising from human errors, malicious intent, and the need for robust security protocols to secure sensitive manufacturing data (Miahkykh et al., 2024; Patel et al., 2024).
3.3 Digital transformation disruption	Inadequate technological resources, insufficient data management systems, and poorly integrated platforms can lead to disruptions and inefficiencies in supply chains and production if not properly managed (Bookbinder et al., 2024; Miahkykh et al.,2024; Taddei et al., 2024).
3.4 Scalability and integration	The expansion of digital systems to facilitate growing production demands introduces scalability risks, including challenges in integrating new equipment with legacy systems, potentially causing operational disruptions, particularly with technologies like quantum computing and AI, which may fail to meet industrial-scale performance requirements (How & Cheah, 2024; Patel et al., 2024).
3.5 Workforce reskilling	Reskilling the workforce to adapt to new technologies occur as a risk, where insufficient training or inadequate technology testing can result in operational disruptions, decreased productivity, and higher costs, particularly when there is a significant skills gap for advanced technologies like quantum AI (How & Cheah, 2024; Hsu et al., 2024).
3.6 Product quality and design	In the context of the circular economy, ensuring consistent product quality from recycled materials presents an operational risk, further made by the complexity of designing for reuse, recycling, or recovery, which can lead to extended development times (Kazancoglu et al., 2023).
3.7 AI autonomy	The unpredictable behaviour of machine learning-based AI systems makes it difficult to ensure consistent and safe performance in dynamic environments (Trzaska & Sus, 2023).
(4) Technological risks	
4.1 File manipulation	Operational failures and financial losses may occur due to the risk of file manipulation - such as altering CAD designs within Industry 4.0 technologies (Patel et al., 2024).
4.2 Cyber resilience	Extended recovery times after cyberattacks due to insufficient cyber resilience can also compromising the integrity of digital systems (Bahmanova & Lace, 2024).
4.3 Technological compatibility	Challenges in ensuring technological compatibility, managing data integrity and maintaining cybersecurity in highly inter-connected environments -especially within Industry 5.0- are risks of underperformance and integration issues between new systems (Hsu et al., 2024; Reboredo & Espadinha-Cruz, 2024).
4.4 Information and communications technology dependency	The increase of dependency on information and communication systems represents an increase in enterprises vulnerability, where failures can cause widespread disruptions in production and data loss, while the transition to these technologies induces complex and emerging threats (Trzaska & Sus, 2023).
4.5 Technology reliability	Due to the possible lack of reliability of new technologies, system failures or malfunctions with serious consequences may occur (Bookbinder et al., 2024).
4.6 Benchmark adoption	Poorly designed performance indicators lead to misaligned goals and operational inefficiencies within the circular economy and result in a bad transition from linear economies to Industry 4.0 processes (Kazancoglu et al., 2023).

(*Continued*)

Table 1. Continued.

(5) Environmental risks	
5.1 Environmental compliance	The implementation of Industry 4.0/5.0 technologies, closely linked to green technologies, introduces environmental constraints and the need for compliance with evolving standards, potentially leading to financial and operational risks due to the required additional investments (Miahkykh et al., 2024).
5.2 Lifecycle security	Disruption in production caused by security gaps (e.g. cyber theft/ attacks) along the product lifecycle process can result in environmental consequences (Patel et al., 2024).
5.3 Sustainability compliance	Companies face risks from growing sustainability demands (e.g. UN Agenda 2030), which may disrupt operations and increase resource inefficiencies if business models and technologies are not aligned with sustainable practices (Camarinha-Matos et al., 2022).
5.4 Sustainable resource management	The implementation of circular supply chains in the context of Industry 4.0 presents environmental risks, especially when new technologies increase resource consumption or waste generation, while the energy requirements of digital systems can increase CO2 emissions and thus restrain to sustainability goals (Taddei et al., 2024).
5.5 Unauthorized/ Unregulated manufacturing	The capability to reverse engineer components (in context of AM) and machine learning may lead to unauthorized production, potentially causing environmental risks if substandard materials are used or production takes place in unregulated settings (Babu et al., 2022).
(6) Sociocultural	
6.1 Cultural and ethical	Especially for internationally operating enterprises, variations in cultural norms, ethical standards, and social responsibility requirements across markets can arise risk (Miahkykh et al., 2024).
6.2 Change management	New organizational and managerial adaptations create risks such as resistance to change, lack of cybersecurity awareness, fail to an effective implementation and others (Camarinha-Matos et al., 2022; How & Cheah, 2024; Reis et al., 2023).
6.3 Psychosocial	Increased stress, anxiety, and social isolation can harm employee well-being and productivity, and concerns about job security and monitoring may lead to resistance and inefficiencies in successfully implementing new technologies (Tamvada et al., 2022; Trzaska & Sus, 2023; Zorzenon et al., 2022).

emphasize challenges such as framework deficiencies, cybersecurity adaptation, or immature technology adaptation, which can undermine organizational resilience and competitive position. Financial risks highlight the burden of high (upfront) costs, cost efficiency, and uncertainties in the return/ mitigation costs. Operational risks focus on scalability, workforce reskilling, and digital transformation disruption, while technological risks focus on integration failures, cyber resilience gaps, and the increased dependency of information and communication systems. Environmental risks emphasize sustainability challenges and compliance demands. Sociocultural risks highlight the human and ethical complexities of adopting disruptive technologies. These findings provide a foundation for understanding and clustering risks, which becomes essential for developing a comprehensive risk assessment and developing targeted mitigation strategies.

4. Discussion and practical implications

Previous research has acknowledged the challenges of technological adoption within Industry 4.0 framework, but this literature review systematically clusters them into six main groups and 36 unique risks based on a holistic approach, demonstrating their interconnectivity and universal adaptable to Industry 4.0/5.0 technologies.

One key finding is the necessity of an integrated approach to risk management, ensuring that enterprises are prepared for both risks and opportunities. While risks such as cybersecurity threats and financial instability, raise challenges, Industry 4.0/5.0 also offers significant benefits, including enhanced operational efficiency, predictive maintenance and sustainability driven innovations. Organizations must balance risk mitigation with leveraging opportunities.

5. Risk mitigation strategies

To make the findings actionable, the provided risk list based on the 83 papers included in the literature review can be summarized and evolved into mitigation strategies as follows:

1) **Strategic risks:** Emphasize alignment between technological adoption and business strategy by incorporating scenario analysis and stress-testing into strategic planning. This alignment helps mitigate risks related to market positioning, regulatory uncertainties, and strategic misalignment. Establishing cross-functional risk committees can further strengthen risk identification and strategic decision making.
2) **Financial risks:** Companies, particularly SMEs, should explore flexible and alternative financing models such as leasing technology, forming strategic partnerships, or using government grants to reduce high upfront costs. Additionally, implementing dynamic financial forecasting models can help enterprises manage cash flow and buffer for unforeseen expenses and financial shocks from technological investments.
3) **Operational risks:** A key mitigation strategy involves structured workforce reskilling programs to bridge skill gaps and ensure seamless integration of Industry 4.0/5.0 technologies. Enterprises should adopt modular and scalable technology systems that allow gradual implementation, reducing operational disruptions. Additionally, firms must establish risk aware supply chain management practices to enhance resilience.
4) **Technological risks:** Organization should invest in advanced cybersecurity infrastructure including continuous monitoring tools, encryption protocol and blockchain technology to safeguard digital assets. Partnering with cybersecurity firms and conducting regular stress testing will help address vulnerabilities. Developing fail-safe redundancy systems ensures continuity in case of complex cyber threats or systems failure.
5) **Environmental risks:** Companies should integrate circular economy principles by prioritising resource optimisation, waste reduction and ecofriendly manufacturing techniques (such as LCA based on ISO1440/14067). Proactive compliance monitoring and automated environmental impact assessments will help businesses stay ahead of regulatory changes and meet sustainability targets.
6) **Sociocultural risks:** To mitigate resistance to change, enterprises must foster a culture of transparency and inclusivity by involving employees in the transformation process. Regular communication, leadership engagement and participatory decision-making can enhance workforce adaptability. Ethical concerns, such as AI-driven decision-making biases, should be addressed through a clear ethical guidelines and AI governance frameworks.

By implementing these structured mitigation strategies, enterprises can not only reduce potential risks but also maximize the opportunities presented by Industry 4.0/5.0 technologies.

6. Conclusion and future research

As this paper systematically identifies and categorizes six key risk groups associated with Industry 4.0/5.0 adoption, this study fills a critical gap in risk assessment literature. Unlike prior research, which focuses on isolated and technology specific risks, this study integrates risk categories to provide a structured and actional framework. Future research should examine: (1) sector specific risks in Industry 4.0/5.0 transformation, (2) regional variations by analysing how different regulatory and economic aspects form risk profiles – especially for global operating SMEs and (3) conduct empirical studies to evaluate how organization's risk profiles develop over time as Industry 4.0/5.0 technology matures. Furthermore, it is necessary to demonstrate the impact of a comprehensive risk management framework on the outcomes of change initiatives to support organisational innovation.

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