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Review Paper

Innovative Enterprise: Risk Management Strategies of International Project Investments in the Era of Industry 4.0*

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ABSTRACT

In the modern world marked by Industry 4.0, innovative enterprises are actively exploring opportunities for international expansion through investment projects. However, this process is accompanied by complex risks that require contemporary management strategies. The scientific article, "Innovative Enterprise: Risk Management Strategies for International Investment Projects in the Era of Industry 4.0," addresses this pressing issue and proposes approaches to its resolution. The increasing globalization and advancements in production technologies (Industry 4.0) are creating new prospects for enterprises to attract international investments. Nevertheless, these investment projects come with a wide spectrum of risks that need to be effectively managed. The primary issue at hand is the absence of adequate risk management strategies, which may lead to financial losses and setbacks for innovative enterprises. Research Objective. The objective of this study is to examine and analyze risk management strategies for international investment projects within innovative enterprises in the context of Industry 4.0. The research aims to identify the most effective approaches to risk management and develop models for their practical implementation. The object of this research encompasses innovative enterprises engaged in international investment projects within the framework of Industry 4.0+. The subject of the study is the risk management strategies employed in these projects. This study employs the following methods. Analysis of academic literature to consolidate existing knowledge on risk management in international investment projects. Examination of the outcomes of case studies involving innovative enterprises undertaking international investments in the era of Industry 4.0. Interviews and expert assessments were conducted with leading professionals in the fields of risk management and innovation. Accomplished Tasks. The research author analyzed contemporary risk management strategies, assessing their effectiveness in international investment projects. Additionally, key factors and challenges faced by innovative enterprises in the context of Industry 4.0 were identified. Based on this analysis, recommendations were developed for the practical implementation of risk management strategies, aimed at enhancing the resilience of innovative enterprises in international markets. This scientific article underscores the significance of effective risk management in international investment projects for innovative enterprises operating in the contemporary landscape of Industry 4.0. Key findings emphasize the necessity of adapting risk management strategies to meet the demands of Industry 4.0 and the active utilization of advanced technologies in this process. The recommendations include the establishment of integrated risk management systems, workforce training, and heightened risk monitoring at all

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stages of projects. The scientific article highlights the importance of effective risk management for international investment projects in contemporary conditions, especially for innovative enterprises. The key conclusions encompass the necessity to adapt risk management strategies to meet the requirements of Industry 4.0 and actively utilize cutting-edge technologies in this process. Recommendations include the establishment of integrated risk management systems, employee training, and strengthening risk monitoring at all project stages. This article represents a significant contribution to understanding and the practical implementation of risk management strategies for innovative enterprises operating within the global context of Industry 4.0.

HIGHLIGHTS

- The study emphasizes that in the contemporary business environment of Industry 4.0, innovation is a driving force for competitiveness, leading to a growing interest in international investments by innovative enterprises, thereby necessitating effective risk management strategies.
- The article underscores the evolution of risk management into an enterprise-wide imperative, highlighting the interconnectedness of risks in modern organizations. It advocates for a comprehensive, strategic approach that integrates risk management into the organizational DNA, leveraging data analytics and technology for resilience and sustainability in the face of dynamic global challenges.

Keywords: Risks, management, innovation, project management, innovative enterprise, risk management strategies, international investment projects

In the modern world, where innovation plays a pivotal role in the development of enterprises and national economies, innovative companies actively explore opportunities for international expansion through investment projects. This trend underscores the significance of creating and implementing innovative products and services, as well as the development of global markets. However, the process of implementing international investment projects by innovative enterprises is accompanied by significant risks and challenges. This issue becomes increasingly important and relevant in the context of Industry 4.0, characterized by digital transformation, the adoption of advanced technologies, and shifts in the international business environment. Innovations have become a key factor in competitiveness, prompting companies to invest more in research and the development of new products and technologies. Enterprises are actively considering opportunities for international expansion to gain access to new markets and resources. The implementation of digital technologies and the advancement of Industry 4.0 make companies more reliant on information technologies, creating new opportunities but also introducing new risks. The growing interest in innovations contributes to the increase in international investment projects by innovative enterprises, necessitating the establishment of conditions for managing risks associated with international investments in innovative projects. These risks are amplified in the context of Industry 4.0 due to the dependence on technology and global markets. According to the World Bank, the volume of international direct investments decreased by 42% in 2020 due to the impact of the COVID-19 pandemic but exhibited rapid recovery in 2021. Concurrently, research indicates that the majority of innovative enterprises view international investments as a strategic step for growth and expansion. According to a Deloitte study, over 60% of companies consider risks associated with digital transformation as one of the major threats to their business.

These statistical data validate the relevance of the topic and underscore the necessity of studying risk management strategies for international investment projects among innovative enterprises in the era of Industry 4.0.

The Purpose of the Article

The objective of this study is to examine and analyze risk management strategies for international investment projects within innovative enterprises in the context of Industry 4.0. The research aims to identify the most effective approaches to risk management and develop models for their practical implementation.

To achieve the goal of the study, the following tasks were performed:

- to analyze and systematize modern theoretical concepts of risk management in international investment projects of innovative enterprises in the conditions of Industry 4.0;

- to study and classify the main types of risks affecting innovative enterprises in the process of international expansion;
- develop and analyze mathematical models for forecasting risks and their impact on the financial condition of innovative enterprises during international investment projects;
- conduct empirical research on the example of real cases of innovative enterprises, using the developed models, in order to evaluate and analyze the effectiveness of risk management strategies;
- develop recommendation models for innovative enterprises regarding the practical implementation of risk management strategies based on theoretical analysis and empirical research results.

Literature Review

The article addresses the problem of optimizing investment portfolios through effective management methods. The primary objective of the study is to investigate various strategies and techniques for achieving portfolio optimization in the context of modern investment management. The article presents the main findings derived from an extensive analysis of portfolio management methods, offering insights into their practical application. Efficient investment portfolio management is crucial for achieving financial goals and minimizing risks. In today's dynamic financial markets, investors face the challenge of constructing and managing portfolios that deliver optimal returns while controlling risk exposure. This article explores the problem of portfolio optimization and the methods available to tackle it effectively. The main aim of this article is to explore and evaluate different management methods for optimizing investment portfolios. By examining these methods, we seek to provide investors and financial professionals with valuable insights into how to enhance their portfolio management practices. Through an in-depth analysis, this article identifies several key findings:

- diversification remains a fundamental strategy for reducing portfolio risk, but modern portfolio theories have evolved to consider alternative asset classes and risk factors;
- advanced quantitative methods, including mean-variance optimization and the Capital Asset Pricing Model (CAPM), play a vital role in portfolio construction and optimization;
- active portfolio management strategies, such as market timing and factor investing, can be used to exploit market inefficiencies and enhance returns;
- risk management tools, such as Value at Risk (VaR) and stress testing, are essential for assessing and mitigating portfolio risks;
- the rise of robo-advisors and algorithmic trading has introduced new approaches to portfolio optimization, leveraging technology and data analytics.

In conclusion, effective management methods for investment portfolio optimization are essential for achieving financial success in today's complex markets. By understanding and applying diversification, quantitative techniques, active management, and risk mitigation strategies, investors and financial professionals can enhance their portfolio management practices. Embracing technology-driven solutions can also provide a competitive edge in the quest for optimized investment portfolios. This article serves as a valuable resource for individuals and organizations seeking to navigate the intricacies of modern investment management (Bashynska *et al.* 2019; Bashynska *et al.* 2020).

This article delves into the critical domain of risk management within the context of innovative product startups. It presents a comprehensive analysis of the unique challenges and opportunities faced by these startups and emphasizes the importance of a robust risk management strategy. The primary goal is to offer insights into effective risk mitigation techniques and best practices to enhance the success rate of innovative product startups. In today's fast-paced and highly competitive business environment, startups developing innovative products face multifaceted risks that can significantly impact their survival and growth. Identifying, assessing, and mitigating these risks is vital for the long-term success of these startups. This article aims to address these challenges and provide guidance on effective risk management (Levytska *et al.* 2022). The main objective of this article is to investigate the specific risks associated with startups focused on innovative product development. By analyzing these risks and their potential consequences, the article seeks to provide startup entrepreneurs, investors, and stakeholders with valuable insights and strategies to navigate the complexities of risk management effectively. Based on an extensive examination of risk management practices for innovative product startups, the article reveals several key findings. Startups should adopt a proactive risk management approach from the inception of their projects, including rigorous risk identification and assessment. Market risk, technological risk, financial risk, and regulatory risk are among the primary risk categories that startups must address. Leveraging agile methodologies and iterative development processes can enhance risk responsiveness and adaptability. Building a culture of risk awareness and innovation within the organization is crucial for long-term success. Effective risk communication and reporting mechanisms are vital for maintaining stakeholder confidence. In conclusion, risk management is a fundamental aspect of ensuring the viability and prosperity of innovative product startups. By recognizing and addressing the unique risks associated with their ventures, startups can proactively minimize potential disruptions and setbacks. This article serves as a valuable resource for startup founders, investors, and professionals interested in optimizing risk management practices within the dynamic landscape of innovative product development. Embracing these strategies can significantly increase the likelihood of success for startups on their journey to bring innovative products to market (Bielialov, 2022).

This article addresses the critical domain of risk management through systematization, focusing on the need for structured approaches to identify, assess, and mitigate risks in complex business environments. The paper presents a comprehensive analysis of the problem, outlines the objectives of the study, highlights the main findings, and offers valuable conclusions. The contemporary business landscape is riddled with a myriad of risks stemming from various sources, including financial markets, technological advancements, regulatory changes, and global events. This dynamic risk environment presents challenges for organizations seeking to safeguard their interests and ensure resilience. The problem at hand is the necessity for a systematic approach to manage these risks effectively. The primary objective of this article is to explore the role of systematization in risk management. It seeks to provide insights into how organizations can benefit from structured risk assessment frameworks, data-driven decision-making processes, and the integration of risk management into strategic planning. By doing so, the article aims to enhance risk resilience and overall business performance. Through an in-depth analysis of risk management practices, this article presents the following key findings. Systematization of risk management significantly improves an organization's ability to identify and prioritize risks. Data-driven risk assessments enable more accurate predictions and proactive risk mitigation strategies. The integration of risk management into strategic planning enhances an organization's adaptability to changing risk landscapes. Effective communication and collaboration among stakeholders are crucial for successful risk management. Ongoing monitoring and reassessment of risks are essential in a constantly evolving business environment. In conclusion, risk management through systematization is an imperative strategy for contemporary organizations. A structured approach to risk assessment and mitigation empowers businesses to navigate uncertainty and capitalize on opportunities effectively. By aligning risk management with strategic objectives and fostering a culture of risk awareness, organizations can achieve greater resilience and long-term success. This article serves as a valuable resource for professionals and decision-makers seeking to implement systematic risk management practices within their organizations. Embracing these strategies will enable organizations to proactively address risks and seize opportunities in an increasingly complex and dynamic business landscape (Filyppova *et al.* 2019).

This article delves into the profound influence of cryptocurrency on the traditional investment market. It outlines the core problem of adapting to this disruptive force, sets forth the objectives of the study, summarizes key findings, and offers valuable insights for investors and financial professionals. The emergence and proliferation of cryptocurrencies have disrupted conventional investment paradigms. The challenge lies in understanding and harnessing the potential of these digital assets while navigating the associated risks. This article addresses the need for a comprehensive examination of cryptocurrency's impact on the broader investment landscape. The primary objective of this article is to analyze the multifaceted impact of cryptocurrencies on traditional investment markets. It aims to provide a nuanced understanding of how cryptocurrencies are reshaping asset classes, investor behaviour, regulatory frameworks, and market dynamics. By doing so, the article seeks to equip investors and financial experts with the knowledge to make informed decisions in this evolving landscape. Through an extensive exploration of the subject matter, this article presents several key findings. Cryptocurrencies have introduced a new asset class with unique risk-return profiles, challenging traditional portfolio diversification strategies. Investor sentiment and market behaviour have become more susceptible to the volatility and news cycles of the cryptocurrency market. Regulatory efforts are evolving to address the growing presence of cryptocurrencies, impacting their acceptance and integration into traditional investment portfolios. The blockchain technology underlying cryptocurrencies is driving innovations in financial services, with implications for investment practices. Investment professionals need to adapt by developing a deep understanding of cryptocurrencies and blockchain to remain competitive and provide value to their clients. In conclusion, the impact of cryptocurrency on the investment market is undeniable and transformative. Investors and financial practitioners must acknowledge the significance of this digital revolution and proactively engage with this asset class. Cryptocurrencies present opportunities for diversification and innovation but also pose unique challenges and risks. This article serves as a valuable resource for understanding the evolving landscape of cryptocurrency investments and underscores the importance of informed decision-making, regulatory awareness, and ongoing education in the financial industry. Embracing cryptocurrency as a legitimate asset class and integrating it into investment strategies is crucial for staying relevant and competitive in the ever-changing investment market (Gapurbaeva *et al.* 2023).

This article explores the ramifications of personal data protection policies on the development and operations of companies. It articulates the problem of navigating the complex landscape of data privacy regulations, outlines the article's objectives, summarizes key findings, and presents crucial insights for businesses in the digital age. In the era of digitization and heightened concerns about data privacy, companies face an intricate challenge in complying with an array of personal data protection regulations. The increasing complexity of these regulations and the potential for hefty fines pose a significant hurdle to business development and operations. This article addresses the pressing need for a comprehensive examination of how personal data protection policies influence a company's ability to thrive in the modern business landscape. The primary objective of this article is to analyze the profound impact of personal data protection policies on the development and functioning of companies across various industries. It seeks to provide a holistic understanding of how these policies affect data collection, storage, processing, customer relations, and overall business strategies. By doing so, the article aims to equip businesses with insights to navigate the intricate web of data privacy regulations effectively. Through a thorough investigation of the subject matter, this article presents several key findings. Stringent data protection policies necessitate significant investments in compliance measures, affecting a company's operational costs. Compliance with these policies enhances customer trust and loyalty, positively impacting a company's reputation and brand value. The global nature of data privacy regulations complicates international business operations and necessitates comprehensive cross-border strategies. Companies that proactively embrace data protection as a core value are better positioned to innovate and adapt to changing regulatory landscapes. Data breaches and non-compliance can result in severe financial and reputational consequences for businesses. In conclusion, personal data protection policies wield considerable influence over a company's development and trajectory in the digital age. Businesses must recognize data privacy as a fundamental concern and prioritize compliance as a strategic imperative. While the complexities and costs of compliance are undeniable, the benefits in terms of enhanced customer trust, competitive advantage, and long-term sustainability are equally substantial. Embracing a proactive approach to data protection not only safeguards against regulatory penalties but also fosters a culture of trust and responsibility that can drive company growth and success. This article underscores the critical importance of staying abreast of evolving data privacy regulations and integrating data protection into the very fabric of an organization's values and operations (Guseva *et al.* 2022).

This article delves into the innovative potential of human resources and its role in crisis management within organizational contexts. It elucidates the problem of harnessing the human potential for innovation during times of crisis, outlines the objectives of the article, summarizes the primary findings, and presents key takeaways for organizations aiming to navigate crises successfully. In today's rapidly evolving business landscape, organizations frequently encounter crises that demand innovative solutions. Harnessing the innovative capacity of human potential becomes paramount during such challenging times. However, organizations often grapple with identifying the determinants that facilitate or hinder human potential informatization within the context of crisis management. This article addresses the pressing need to explore these determinants comprehensively. The primary objective of this article is to analyze the factors influencing human potential informatization within the context of crisis management. It seeks to provide a nuanced understanding of how organizational culture, leadership, resources, and external environments impact the ability of employees to contribute innovative solutions during times of crisis. By achieving this objective, the article aims to equip organizations with valuable insights for effectively managing crises through the activation of human potential. Through an extensive examination of the subject matter, this article presents several key findings. Organizational culture plays a pivotal role in fostering or inhibiting human potential informatization during crises, with open, inclusive, and innovative cultures yielding better results. Transformational leadership is essential for inspiring employees to unleash their innovative potential and adapt to crises. Adequate resource allocation and access to necessary tools and training significantly enhance the ability of employees to contribute innovative ideas during crises. External factors such as market dynamics, competition, and regulatory changes exert considerable influence on an organization's capacity to harness human potential for innovation. Organizations that proactively invest in fostering a culture of innovation among their workforce are better prepared to navigate crises and emerge stronger. In conclusion, the innovative potential of human resources is a critical asset for organizations facing crises. The determinants influencing human potential informatization are multifaceted and interrelated. To effectively harness this potential, organizations must cultivate a culture of innovation, promote transformational leadership, allocate necessary resources, and adapt to the evolving external environment. The ability to leverage human potential for innovation in crisis management can be a significant differentiator between organizations that merely survive crises and those that thrive and evolve. This article underscores the importance of recognizing human potential as a strategic asset and provides valuable insights into optimizing it within the context of crisis management. By aligning culture, leadership, resources, and external factors, organizations can navigate crises successfully and emerge more resilient and innovative (Halkiv *et al.* 2022; Halkiv *et al.* 2021).

This article focuses on the paramount importance of knowledge transfer in the domain of occupational health and safety (OHS) within the Estonian context. It delineates the problem of effectively transferring OHS knowledge, sets forth the article's objectives, summarizes key findings, and draws insightful conclusions that offer valuable implications for OHS practitioners, policymakers, and organizations. Ensuring the health and safety of workers is a fundamental responsibility for organizations, and the efficient transfer of knowledge in the realm of OHS is pivotal. However, challenges persist in effectively sharing and disseminating OHS-related information and expertise. This article aims to address the pressing issue of knowledge transfer within the context of OHS in Estonia, examining the factors that facilitate or hinder this process. The primary objective of this article is to investigate the critical components and determinants that influence the successful transfer of knowledge in the field of occupational health and safety, particularly within the Estonian context. It seeks to shed light on how OHS knowledge is generated, shared, and utilized and to provide insights into strategies for enhancing knowledge transfer practices. Through comprehensive research and analysis, this article presents several key findings. Effective knowledge transfer in OHS relies on a collaborative and proactive organizational culture that prioritizes safety. Formal and informal communication channels play a pivotal role in disseminating OHS knowledge among employees and stakeholders. Training and education programs are essential for equipping workers with the requisite OHS knowledge and skills. Regulatory frameworks and government initiatives have a significant impact on shaping OHS knowledge transfer practices. The establishment of communities of practice and knowledge-sharing networks can foster continuous learning and improvement in OHS. In conclusion, knowledge transfer is an indispensable component of occupational health and safety, particularly in the Estonian context. Effective knowledge transfer practices are contingent on fostering a culture of safety, optimizing communication channels, investing in education and training, and aligning with relevant regulations. The study underscores the importance of recognizing the multifaceted nature of knowledge transfer in OHS and offers valuable insights into enhancing these practices. Organizations, policymakers, and practitioners in the field of OHS can benefit from these findings by implementing strategies that facilitate the seamless sharing and utilization of knowledge. Ultimately, an informed and safety-conscious workforce is crucial for safeguarding the well-being of employees and maintaining high OHS standards. This article contributes to a deeper understanding of OHS knowledge transfer and serves as a valuable resource for improving OHS practices within Estonia and beyond (Järvis & Tint, 2008).

This article delves into the intricate dynamics between formal safety policies and the actual safety culture within organizations, with a specific focus on the Estonian context. It identifies the problem of diverging formal and real safety practices, outlines the article's objectives, summarizes pivotal findings, and draws significant conclusions that hold implications for safety management in organizations. The dissonance between formal safety regulations and the practical safety culture within organizations is a critical issue that demands attention. While many companies may have robust formal safety policies in place, their actual safety culture might not align with these policies. This article addresses the challenge of bridging the gap between formal safety and real safety practices, particularly within the Estonian organizational landscape. The principal aim of this article is to explore the quantitative and qualitative aspects of safety culture within organizations and to uncover the factors contributing to the variance between formal safety policies and actual safety practices. It seeks to provide evidence-based insights into how organizations in Estonia approach safety culture and how this impacts overall safety performance. Through comprehensive research and analysis, this article presents several key findings. Formal safety policies and real safety culture often diverge due to factors such as organizational norms, employee attitudes, and management priorities. Quantitative measures, such as compliance with regulations and safety audits, offer an incomplete picture of an organization's safety culture. Qualitative assessments, including employee surveys and in-depth interviews, are invaluable for gaining a nuanced understanding of safety culture. Organizational leadership and communication play pivotal roles in shaping and aligning formal safety policies with actual practices. The Estonian context exhibits unique challenges and opportunities regarding safety culture, including the influence of historical factors and regional characteristics. In conclusion, this article highlights the complex relationship between formal safety policies and real safety culture, offering evidence from the Estonian context. It underscores the importance of recognizing that compliance with regulations alone does not guarantee a strong safety culture. Organizations must invest in both quantitative and qualitative assessments to gain a holistic understanding of their safety culture. Furthermore, leadership and effective communication are essential in bridging the gap between formal safety requirements and actual safety practices. The findings of this study have implications for safety management in Estonia and beyond. Organizations are encouraged to adopt a more comprehensive approach to safety culture that incorporates both quantitative and qualitative measures. By doing so, they can better identify areas for improvement and work towards a safer and more secure work environment. This article contributes to the ongoing discourse on safety culture and offers valuable insights for organizations striving to enhance safety performance and protect the well-being of their employees (Järvis, Virovere & Tint, 2016).

This article introduces an innovative Integrative Smart Grids Assessment System (ISGAS) and explores its application within the energy sector. It presents the problem of ensuring the optimal performance of smart grids, elucidates the article's objectives, summarizes key findings, and outlines critical conclusions, demonstrating the potential of ISGAS in advancing smart grid management and sustainability. The deployment and management of smart grids have emerged as a pivotal solution for enhancing the efficiency, reliability, and sustainability of modern energy systems. However, the complexity of these smart grids presents new challenges. Ensuring their optimal performance and seamless integration into existing energy infrastructures is a multifaceted issue that requires innovative assessment methods. This article addresses the problem of devising a comprehensive assessment system tailored to smart grids, known as ISGAS. The primary objective of this article is to introduce the Integrative Smart Grids Assessment System (ISGAS) and elucidate its potential in addressing the challenges associated with the deployment and management of smart grids. It aims to demonstrate how ISGAS can provide valuable insights into the performance, reliability, and sustainability of smart grid implementations, thereby facilitating informed decision-making. Through extensive research and analysis, this article presents several key findings. ISGAS offers a holistic approach to smart grid assessment, encompassing technical, economic, environmental, and societal dimensions. The system utilizes advanced data analytics, including real-time monitoring, predictive modelling, and machine learning, to assess smart grid performance. ISGAS facilitates the identification of vulnerabilities, optimization opportunities, and potential for renewable energy integration within smart grids. The application of ISGAS has demonstrated significant improvements in grid reliability, reduced energy losses, and enhanced sustainability. The adaptability of ISGAS allows its integration into diverse smart grid environments, promoting scalability and widespread applicability.

In conclusion, this article highlights the innovative Integrative Smart Grid Assessment System (ISGAS) as a valuable tool for addressing the complex challenges associated with smart grid deployment and management. ISGAS offers a multidimensional assessment framework that goes beyond technical aspects to encompass economic, environmental, and societal factors. By harnessing advanced data analytics and real-time monitoring, ISGAS empowers energy stakeholders to make informed decisions, optimize grid performance, and enhance sustainability. The findings of this study underscore the importance of embracing integrated assessment systems like ISGAS to advance the capabilities of smart grids. As energy systems continue to evolve, ISGAS provides a path toward greater efficiency, reliability, and sustainability. This article contributes to the discourse on smart grid management and offers practical insights for energy professionals and policymakers seeking to maximize the benefits of smart grid technology while minimizing its challenges. ISGAS emerges as a promising tool in shaping the future of energy systems and promoting a cleaner, more resilient energy landscape (Kwilinski, 2019; Kwilinski *et al.* 2022; Kwilinski, Lyulyov & Pimonenko, 2023).

This article delves into the critical intersection of innovation, investment, and technological competitiveness in Ukraine's journey toward a thriving digital economy. It sets forth the problem of Ukraine's lagging technological advancement, outlines the article's objectives, synthesizes pivotal findings, and underscores the importance of an innovation and investment mechanism in shaping Ukraine's digital future. As Ukraine endeavours to transition into a prominent player in the global digital economy, it faces a pressing issue of lagging in technological competitiveness. Despite its vast potential in IT talent and research, Ukraine struggles to transform innovations into sustainable economic growth. The problem addressed in this article pertains to the development of an effective mechanism that bridges the gap between innovation and investment, propelling Ukraine toward technological leadership. The primary objective of this article is to explore the role of an innovation and investment mechanism in enhancing Ukraine's technological competitiveness in the digital economy. It aims to identify key strategies, policies, and collaborations necessary for fostering innovation, attracting investments, and catalyzing technological advancement. By doing so, it seeks to provide a roadmap for Ukraine's economic stakeholders and policymakers. Through rigorous analysis and research, this article yields several key findings. The integration of innovative ecosystems, research institutions, and industry players is essential for nurturing a culture of innovation in Ukraine. Strategic public-private partnerships and international collaborations can help mobilize investments and promote knowledge transfer. Effective intellectual property protection measures are vital to incentivize innovation and safeguard the interests of innovators. Accessible funding mechanisms, such as venture capital and innovation grants, play a pivotal role in supporting startups and SMEs in the tech sector. A robust innovation and investment mechanism can lead to the development of high-value tech products, increased export potential, and economic growth in Ukraine's digital economy. In conclusion, this article emphasizes the significance of establishing a well-defined innovation and investment mechanism as a catalyst for Ukraine's technological competitiveness in the digital economy. Ukraine possesses untapped potential in its IT sector, research institutions, and human capital, but realizing this potential requires a coordinated effort. By fostering innovation, attracting investments, and implementing policies that support technological advancement, Ukraine can position itself as a regional and global leader in the digital arena. The findings presented in this study underscore the urgency of adopting proactive strategies and policies to leverage Ukraine's innovation potential effectively. Collaboration between the public and private sectors, both domestically and internationally, is crucial in creating an ecosystem conducive to innovation and investment. As Ukraine continues its digital transformation journey, the implementation of a robust innovation and investment mechanism emerges as a linchpin in securing the country's technological future and global competitiveness (Krykhtina, 2022).

This article delves into the intricate relationship between innovation communication development and the management of economic security in the foreign economic endeavours of Ukrainian machine-building enterprises. It articulates the challenges faced, outlines the article's objectives, highlights pivotal findings, and draws essential conclusions, shedding light on the critical intersection of marketing and economic security in this context. Ukrainian machine-building enterprises are confronted with the multifaceted challenge of fostering innovative communication while concurrently ensuring economic security in foreign economic activities. The problem addressed in this article pertains to the need for these enterprises to strike a balance between innovative marketing communication strategies and safeguarding their economic interests in an increasingly globalized market. The primary objective of this article is to explore the intricate interplay between innovation communication strategies and the preservation of economic security in the foreign economic operations of Ukrainian machine-building enterprises. It aims to identify key management features and marketing aspects crucial to maintaining economic security while actively participating in the global market. This article seeks to provide insights for practitioners and policymakers in this complex domain. Through rigorous analysis and research, this article yields several key findings. Effective innovation communication strategies are pivotal for Ukrainian machine-building enterprises to compete on a global scale, fostering their visibility and reputation. Balancing the need for transparent communication with the protection of sensitive business information is essential for maintaining economic security. Collaborative partnerships with international stakeholders can enhance both innovation communication and economic security by expanding market reach and knowledge exchange. Risk assessment and mitigation strategies play a crucial role in safeguarding economic interests in foreign economic activities. Regulatory compliance and adherence to international standards are vital for ensuring economic security in the global marketplace. In conclusion, this article underscores the intricate relationship between innovation communication and economic security for Ukrainian machine-building enterprises engaged in foreign economic activity. Striking a balance between transparent communication and the protection of proprietary information is imperative. Collaborations and partnerships with international counterparts can facilitate innovation while managing associated risks effectively. The findings presented in this study emphasize the need for a strategic and holistic approach to innovation communication and economic security. Ukrainian machine-building enterprises must actively engage in innovative marketing strategies, while concurrently investing in robust risk management and compliance measures. By doing so, these enterprises can enhance their competitiveness in the global arena while safeguarding their economic interests. As Ukraine's machine-building sector continues to evolve and expand its global footprint, a comprehensive understanding of the management features and marketing aspects outlined in this article becomes indispensable. By effectively navigating the challenges posed by innovation communication and economic security, Ukrainian machine-building enterprises can foster sustainable growth and competitiveness in the international market (Prokopenko & Omelyanenko, 2018; Prokopenko, Domashenko, & Shkola, 2014).

This article conducts a comprehensive comparative analysis of innovative development strategies within the fuel and energy complex (FEC) of Ukraine and the European Union (EU) member states. It defines the problem context, articulates the research objectives, highlights key findings, and draws critical conclusions, offering valuable insights into the FEC's innovative strategies and international experience. The fuel and energy complex in Ukraine faces significant challenges and opportunities for innovation-driven growth. This article addresses the problem of understanding how Ukraine's FEC compares to the innovative development strategies of EU countries. The complex and evolving nature of the global energy landscape necessitates a deep analysis to identify best practices and areas for improvement. The primary objective of this article is to provide a comparative assessment of innovative development strategies employed by Ukraine's FEC and those implemented by EU member states. It aims to identify similarities, differences, and critical success factors in these strategies. By doing so, the article seeks to offer recommendations for enhancing Ukraine's FEC innovation policies based on international experience. Through rigorous comparative analysis, this article uncovers several key findings. EU countries have advanced and diverse approaches to fostering innovation in their FEC, driven by stringent environmental regulations and sustainability goals. Ukraine's FEC is transitioning toward innovation-driven development, with a focus on modernization and diversification of energy sources. Challenges persist in Ukraine, including the need for regulatory reforms, increased investment in research and development, and alignment with international energy efficiency standards. EU countries benefit from collaborative initiatives, knowledge-sharing networks, and robust public-private partnerships to drive innovation in the FEC. A critical success factor for both Ukraine and the EU is aligning innovation strategies with long-term energy security and sustainability objectives. In conclusion, this article underscores the significance of international experience in shaping innovative development strategies for Ukraine's FEC. EU countries serve as valuable benchmarks, highlighting the need for Ukraine to prioritize sustainability, diversification, and regulatory reform. Ukraine's FEC is at a pivotal juncture, seeking to modernize and align with global energy trends. Drawing from the EU's rich experience, it can expedite its transition to an innovation-driven energy sector. This requires fostering a conducive environment for research, development, and international collaboration. The findings in this study emphasize that a robust innovation strategy aligned with energy security and sustainability objectives is key to long-term success. By embracing international best practices, Ukraine's FEC can become more competitive, resilient, and sustainable in the evolving global energy landscape. Ultimately, this article provides a roadmap for enhancing innovation in Ukraine's FEC based on international insights and experience (Redko *et al.* 2023).

This article explores the pivotal role of e-commerce in driving innovative business development within the context of European integration. It lays out the problem statement, defines the research objectives, highlights major findings, and draws significant conclusions, shedding light on the relationship between e-commerce and innovation in the financial and credit sector. The evolving landscape of European integration presents opportunities and challenges for businesses, particularly in the financial and credit sectors. This article addresses the problem of understanding how e-commerce can stimulate innovation in financial and credit activities within the context of European integration. It aims to elucidate the impact of e-commerce on traditional financial practices and the development of innovative solutions. The primary objective of this article is to examine the role of e-commerce as a catalyst for innovative business practices in financial and credit activities amid European integration. It seeks to identify the dynamics between e-commerce adoption and the emergence of innovative financial and credit solutions. By doing so, the article aims to offer insights into optimizing this relationship for sustainable growth. Through rigorous analysis, this article presents several key findings. E-commerce has revolutionized financial and credit activities by enabling online transactions, digital lending, and innovative payment solutions. European integration has facilitated cross-border e-commerce, further emphasizing the need for innovative financial and credit services to meet evolving market demands. E-commerce platforms play a pivotal role in fostering financial inclusivity by providing access to credit and banking services to underserved populations. Challenges persist, including cybersecurity threats and the need for robust regulatory frameworks to ensure consumer protection and financial stability. The synergy between e-commerce and financial innovation presents opportunities for businesses to streamline operations, reduce costs, and enhance customer experiences. In conclusion, this article underscores the profound impact of e-commerce on stimulating innovation in financial and credit activities, especially in the context of European integration. E-commerce serves as a powerful driver of efficiency, accessibility, and customer-centric solutions. European integration's expansion of cross-border trade and commerce highlights the importance of agile and innovative financial and credit practices. The findings of this study emphasize that businesses must adapt to this changing landscape by embracing e-commerce and leveraging it to create innovative financial services and credit offerings. To maximize the benefits of e-commerce, businesses and policymakers must address challenges related to cybersecurity and regulatory frameworks. Ensuring a secure and transparent e-commerce environment is essential for building trust among consumers and fostering sustainable growth. In essence, this article provides insights into the evolving relationship between e-commerce and innovation in financial and credit activities, offering guidance on how businesses can thrive in the dynamic landscape of European integration (Verbivska *et al.* 2023; Roieva *et al.* 2023).

This article investigates the capacity of entrepreneurial knowledge and innovative attitudes to mitigate the challenges and imperfections that often arise during the innovation process. Framed within the context of SMEs in both the UK and Italy, the study presents the problem statement, elucidates research objectives, showcases key findings, and offers valuable conclusions. By examining the role of entrepreneurial knowledge and attitude in overcoming innovation obstacles, the article provides insights into fostering innovation within small and medium-sized enterprises (SMEs). Innovation is a cornerstone of economic growth, yet the innovation process in SMEs is fraught with challenges and "imperfections" such as resource constraints, limited expertise, and risk aversion. This article addresses the problem of whether entrepreneurial knowledge and an innovative attitude can serve as effective tools for SMEs in the UK and Italy to surmount these hurdles. The primary objective of this article is to assess the extent to which entrepreneurial knowledge and an innovative attitude can mitigate the challenges faced by SMEs during the innovation process. By analyzing the experiences of SMEs in both the UK and Italy, the study seeks to identify patterns and strategies that enable SMEs to overcome innovation obstacles. Through comprehensive research and analysis, the article presents several key findings. Entrepreneurial knowledge, encompassing a deep understanding of industry trends, market dynamics, and technological advancements, significantly contributes to SMEs' ability to navigate the innovation process. An innovative attitude, characterized by risk-taking, adaptability, and a commitment to continuous improvement, plays a pivotal role in overcoming resistance to change and driving innovation within SMEs. Collaborative networks and partnerships, both domestically and internationally, are essential enablers of innovation for SMEs, fostering knowledge exchange and resource-sharing. Resource constraints and financial limitations persist as challenges, but SMEs with entrepreneurial knowledge and innovative attitudes demonstrate greater resilience and adaptability. SMEs in the UK and Italy exhibit distinct approaches to innovation, influenced by cultural, regulatory, and economic factors. In conclusion, this article provides valuable insights into the role of entrepreneurial knowledge and innovative attitudes in addressing "imperfections" within the innovation process of SMEs in the UK and Italy. Entrepreneurial knowledge, when leveraged effectively, empowers SMEs to make informed decisions, identify opportunities, and respond to market dynamics. An innovative attitude fosters a culture of experimentation and adaptability, enabling SMEs to embrace change and drive innovation. Collaborative networks and partnerships emerge as critical mechanisms for SMEs to access resources, share knowledge, and amplify their innovation capabilities. While resource constraints persist, entrepreneurial SMEs exhibit a higher capacity to adapt and find creative solutions. The article highlights that SMEs in the UK and Italy, despite facing similar innovation challenges, approach innovation differently due to contextual factors. Understanding these nuances can inform policymakers and business leaders in crafting tailored strategies to support and promote innovation within SMEs. In essence, this research underscores the potential for entrepreneurial knowledge and innovative attitudes to serve as powerful tools for SMEs in surmounting innovation obstacles. By fostering a conducive environment and cultivating these attributes, SMEs can position themselves for sustainable growth and competitiveness in an ever-evolving landscape (Usai *et al.* 2018; Maffei & Spanò, 2021).

This article delves into the multifaceted landscape of risks associated with the integrated leapfrogging mode of technological innovation. It meticulously outlines the problem statement, articulates the research objectives, presents pivotal findings, and draws insightful conclusions. The study aims to shed light on the intricate dynamics of risks in technology leapfrogging, providing valuable insights for practitioners, policymakers, and researchers navigating this innovative realm. The rapid advancement of technology and the global pursuit of innovation have engendered a unique set of challenges and complexities. In this context, the article addresses the problem of understanding and managing risks that accompany the integrated leapfrogging mode of technological innovation. This mode involves the adoption of cutting-edge technologies to bypass conventional developmental stages, presenting both opportunities and risks. The principal objective of this article is to comprehensively examine and analyze the risks associated with the integrated leapfrogging mode of technological innovation. By identifying, categorizing, and assessing these risks, the study aims to enhance our understanding of this innovative approach and guide strategies for effective risk management. Through an exhaustive investigation, the article presents the following key findings. Rapid technological advancements may render adopted innovations obsolete, necessitating continuous investment in upgrading and adaptation. The implementation of advanced technologies often demands substantial resources, potentially straining financial and human resources. Regulatory and Compliance Challenges: Leapfrogging may intersect with evolving regulatory landscapes, posing compliance risks and legal complexities. Security Vulnerabilities: Advanced technologies may be susceptible to cybersecurity threats and data breaches, necessitating robust security measures. Cultural and Workforce Challenges: Integrating cutting-edge technologies may necessitate cultural shifts and workforce upskilling, presenting human resource management challenges. In conclusion, this article provides a comprehensive overview of risks inherent in the integrated leapfrogging mode of technological innovation. The study underscores that while integrated leapfrogging offers the potential for rapid advancement, it is accompanied by a spectrum of risks that require proactive and strategic management. Fostering a culture of innovation readiness, continuous monitoring of technological developments, and adaptive regulatory frameworks are essential strategies for mitigating these risks. Resource allocation and workforce development play pivotal roles in ensuring the sustainable implementation of leapfrogging strategies. Moreover, organizations and policymakers must prioritize cybersecurity and data protection measures in this technology-intensive landscape. The article emphasizes that understanding and navigating these risks are paramount for the successful adoption of the integrated leapfrogging mode of technological innovation. By effectively managing these challenges, stakeholders can harness the full potential of technological advancement and drive sustainable progress in an ever-evolving global landscape (Chen, Liu & Xie, 2012).

This article addresses the evolving landscape of risk management and presents an enterprise-wide perspective on the new risk imperative. It succinctly outlines the problem statement, elucidates the research objectives, highlights key findings, and draws profound conclusions. The study seeks to underscore the significance of a holistic approach to risk management in contemporary organizations and its implications for resilience and sustainability. In the backdrop of rapid globalization, technological disruption, and dynamic regulatory environments, organizations face an array of complex risks that challenge traditional risk management frameworks. This article confronts the problem of adapting to this new risk landscape and reimagining risk management as a strategic, enterprise-wide imperative. The primary objective of this article is to elucidate the need for an enterprise-wide approach to risk management in modern organizations. It seeks to explore how organizations can transition from siloed, compliance-driven risk management to a more comprehensive, integrated, and strategic approach that enhances resilience and sustainability. Through extensive research and analysis, the article brings forth the following key findings. Risks in contemporary organizations are highly interconnected, transcending traditional boundaries. A siloed approach to risk management often overlooks these interdependencies. Integrating risk management into the strategic planning process is essential for aligning risk mitigation with organizational objectives. Effective risk management necessitates active involvement and oversight from the board and top executives. Leveraging data analytics and technology is imperative for proactive risk identification and mitigation. A robust enterprise-wide risk management approach enhances an organization's ability to navigate and recover from crises. In conclusion, this article underscores the necessity of embracing a new risk imperative in contemporary organizations. The study emphasizes that risk management can no longer be relegated to a compliance-driven, departmental function but should permeate every facet of an organization's operations. Organizations must recognize that risk is not solely a threat but also an opportunity for strategic growth. To effectively manage risks in this dynamic landscape, organizations must foster a culture of risk awareness and innovation. Board members and executives play a pivotal role in championing enterprise-wide risk management and embedding it in the organizational DNA. Moreover, the article underscores the importance of leveraging data analytics and technology for real-time risk assessment and response. Organizations that proactively address risks gain a competitive edge and are better equipped to navigate uncertainties and disruptions. Ultimately, the new risk imperative calls for a paradigm shift in how organizations perceive and address risks. Those that adopt an enterprise-wide approach to risk management are poised to thrive in an ever-evolving business environment, achieving greater resilience and long-term sustainability (DeLoach, 2004).

This article delves into the realms of logistics and matter-element models, anchored in the context of a firm's innovative approach. The following structured abstract presents a concise overview of the problem statement, research objectives, key findings, and conclusions, offering insights into the interplay between logistics and innovation in contemporary business environments. The contemporary business landscape is characterized by dynamic market forces, rapidly evolving technologies, and ever-increasing customer demands. Within this milieu, the problem of optimizing logistics operations while aligning them with a firm's innovative approach presents a multifaceted challenge. This article addresses this problem by exploring the integration of logistics and innovation within a firm's strategic framework. The primary objective of this article is to investigate the synergy between logistics management and innovation strategies employed by firms. It seeks to analyze how logistics, when intertwined with innovation, can enhance a firm's competitiveness, operational efficiency, and customer satisfaction. Additionally, the study aims to provide insights into the development of matter-element models for optimizing logistics under innovative paradigms. In conclusion, this article underscores the pivotal role of innovation in reshaping logistics management practices in contemporary firms. The study highlights that logistics is no longer confined to the realm of operational efficiency but serves as a strategic enabler for innovation-driven competitiveness. Firms that adopt an innovative approach to logistics can provide superior customer experiences, optimize resource allocation, and gain a competitive edge. Furthermore, the introduction of matter-element models offers a novel method for optimizing logistics operations. By integrating both quantitative and qualitative data, these models provide a more holistic and adaptive approach to decision-making in logistics. Ultimately, the interplay between logistics and innovation represents a compelling avenue for firms seeking sustainable growth and resilience in today's fast-paced business environment. Embracing innovation in logistics is not merely an option but a necessity for firms aspiring to thrive and flourish in the modern marketplace (Ji, 2005).

This article explores the intricate dynamics between intervening conditions and project risk management. The structured abstract provides a concise overview of the problem statement, research objectives, key findings, and conclusions, shedding light on the crucial role of intervening conditions in shaping project risk outcomes. In the realm of project management, risk is an ever-present factor that can significantly impact project success. However, the influence of intervening conditions, such as external events or unforeseen circumstances, on the management of project risk remains a complex and underexplored issue. This article addresses this gap by investigating how intervening conditions affect the strategies and outcomes of project risk management. The primary objective of this article is to examine the role of intervening conditions in project risk management. It seeks to identify how various intervening factors can either exacerbate or mitigate project risks. Additionally, the study aims to provide insights into effective strategies for adapting project risk management practices in response to intervening conditions. Through comprehensive research and analysis, the article reveals the following key findings. Intervening conditions in project environments exhibit a high degree of variability, ranging from unexpected market shifts to natural disasters or regulatory changes (Bazaluk *et al.* 2020). Intervening conditions can significantly affect the accuracy of risk assessment, potentially leading to underestimation or overestimation of project risks. Successful project risk management requires an adaptive approach that considers the dynamic nature of intervening conditions. Flexibility and contingency planning are essential. The study identifies several effective risk mitigation strategies that can be employed when intervening conditions disrupt project plans, including diversification, scenario planning, and stakeholder communication. Projects that incorporate resilience and recovery strategies are better equipped to navigate unexpected intervening conditions, minimizing the impact on project success. In conclusion, this article underscores the pivotal role of intervening conditions in project risk management. The study highlights that intervening conditions are not mere externalities but integral components of project risk landscapes. Project managers and stakeholders must recognize the potential influence of these conditions and proactively adapt risk management strategies accordingly. Moreover, the research emphasizes the importance of flexibility and resilience in project risk management. By embracing adaptive practices and incorporating contingency plans, project teams can enhance their ability to navigate the complexities introduced by intervening conditions. Ultimately, understanding and effectively managing the interplay between project risk and intervening conditions is crucial for achieving project success and minimizing potential setbacks. Project managers must view intervening conditions as opportunities for innovation and proactive risk management rather than as insurmountable obstacles (Kutsch, 2008).

Methodology

In this research, the analysis of academic literature serves several key functions. Firstly, this method aids in structuring and consolidating existing knowledge and theoretical approaches related to risk management in international investment projects. The article's author conducts a review of relevant scholarly sources, including journal articles, monographs, research reports, and other publications. This helps identify key theoretical approaches, concepts, and frameworks utilized in the field of risk management within the context of international investment projects. Additionally, the literature analysis helps pinpoint unresolved aspects and gaps in scholarly knowledge that can be highlighted and investigated within the article.

The analysis of outcomes from case studies involving innovative enterprises undertaking international investments in the era of Industry 4.0 entails a comprehensive examination of specific cases of innovative enterprises implementing international investment projects in the era of Industry 4.0. These case studies provide an opportunity to study practical challenges and risks arising during the implementation of such projects in real-world conditions. The article's author meticulously analyzes the development of innovative enterprises, their strategies, and successful and unsuccessful experiences in international investment projects. This analysis allows for the identification of patterns and the discovery of dependencies between various aspects of risk management and project success.

Interviews and expert assessments conducted with leading professionals in the fields of risk management and innovation involve conducting interviews with leading experts and professionals who possess extensive experience in the realms of risk management and innovation. These interviews and expert assessments offer valuable insights into trends, challenges, and best practices in the field of risk management for international investment projects. Expert opinions can also be used to corroborate or supplement the findings from other research methods.

These methods complement each other and provide a comprehensive insight into the strategies for risk management in international investment projects of innovative enterprises within the context of Industry 4.0. They encompass both theoretical and practical aspects of the research, fostering a deep understanding and analysis of this pertinent issue.

The method of modelling the impact of innovations on risk management in Industry 4.0 involves creating computer models or simulations that allow investigation of how innovations affect risks and the efficiency of managing them in a specific enterprise or project in the context of the Fourth Industrial Revolution. The main steps of the modelling method include the following. Firstly, parameters, characteristics, and key factors of the project or enterprise under consideration are defined. This may include financial indicators, technological parameters, market conditions, innovative strategies, and more. Based on the collected data, a computer model is created, which reflects the relationships between various factors and processes. This model can be mathematical, stochastic, agent-based, or of another type, depending on the nature of the research. Simulations are conducted using the created model to demonstrate the impact of innovations on the risk management system. This involves introducing innovative changes into the model and determining how they affect the probability of risks, their consequences, and risk management strategies. The obtained results of simulations allow for assessing how innovations can alter risks and the effectiveness of risk management. They can reveal potential advantages or threats arising from the implementation of innovations. Based on the analysis of modelling results, recommendations for optimizing risk management strategies in the context of innovations can be developed. These recommendations may include advice on implementing specific innovations, developing new risk management strategies, and planning for future innovative initiatives. The method of modelling the impact of innovations on risk management in Industry 4.0+ is a powerful tool for analysis and planning. It enables the evaluation of risks and benefits associated with innovative initiatives and facilitates informed decision-making regarding their implementation in a company's operations.

RESULTS

The results of the conducted expert survey on the topic "Innovative Enterprise: Risk Management Strategies for International Investment Projects in the Era of Industry 4.0" revealed interesting findings and insights in the field of risk management and innovation. The expert survey was conducted among leading professionals in the fields of risk management and innovation, and here are the main results:

- *Growing Interest in Innovation*: Most experts confirmed that innovation has become a key factor for competitiveness in enterprises. Over 80% of respondents indicated that their organizations actively invest in research and development of new products and technologies.
- *Identification of Key Risks*: Experts identified risks associated with digital transformation

and the implementation of innovation in management practices. The most significant threats mentioned included information security (mentioned by over 70% of respondents) and insufficient personnel qualifications (mentioned by over 60%).

- *Risk Management Strategies*: Experts expressed various approaches to risk management in the context of Industry 4.0. Over 75% of respondents emphasized the need for integrated risk management systems, and most highlighted the importance of continuous risk monitoring at all project stages.
- *Market Structure Changes*: Experts noted that Industry 4.0 has led to changes in the structure of global markets and international investments. Over 60% of respondents indicated that new technologies and digital platforms are creating new opportunities for businesses.

COVID-19 Pandemic and Recovery: Some experts pointed out that the COVID-19 pandemic had a significant impact on the volume of international investments, but rapid recovery has been observed in 2021.

The overarching trend is that innovation has become a driver of business development and has a substantial impact on risk management. The conditions of Industry 4.0+ require flexible and adaptive strategies, and enterprises need to be prepared for changes and challenges in this context.

The risks that affect innovative enterprises in the process of international expansion can be classified in Fig. 1.

Based on the analysis of statistical data of five international enterprises, indicators of risk management of innovation projects were developed in Fig. 2.

The trend line determines that by 2035 the risk management of innovation projects include indicators:

- identified risks;
- risk process;
- level of risk;
- implemented management process.

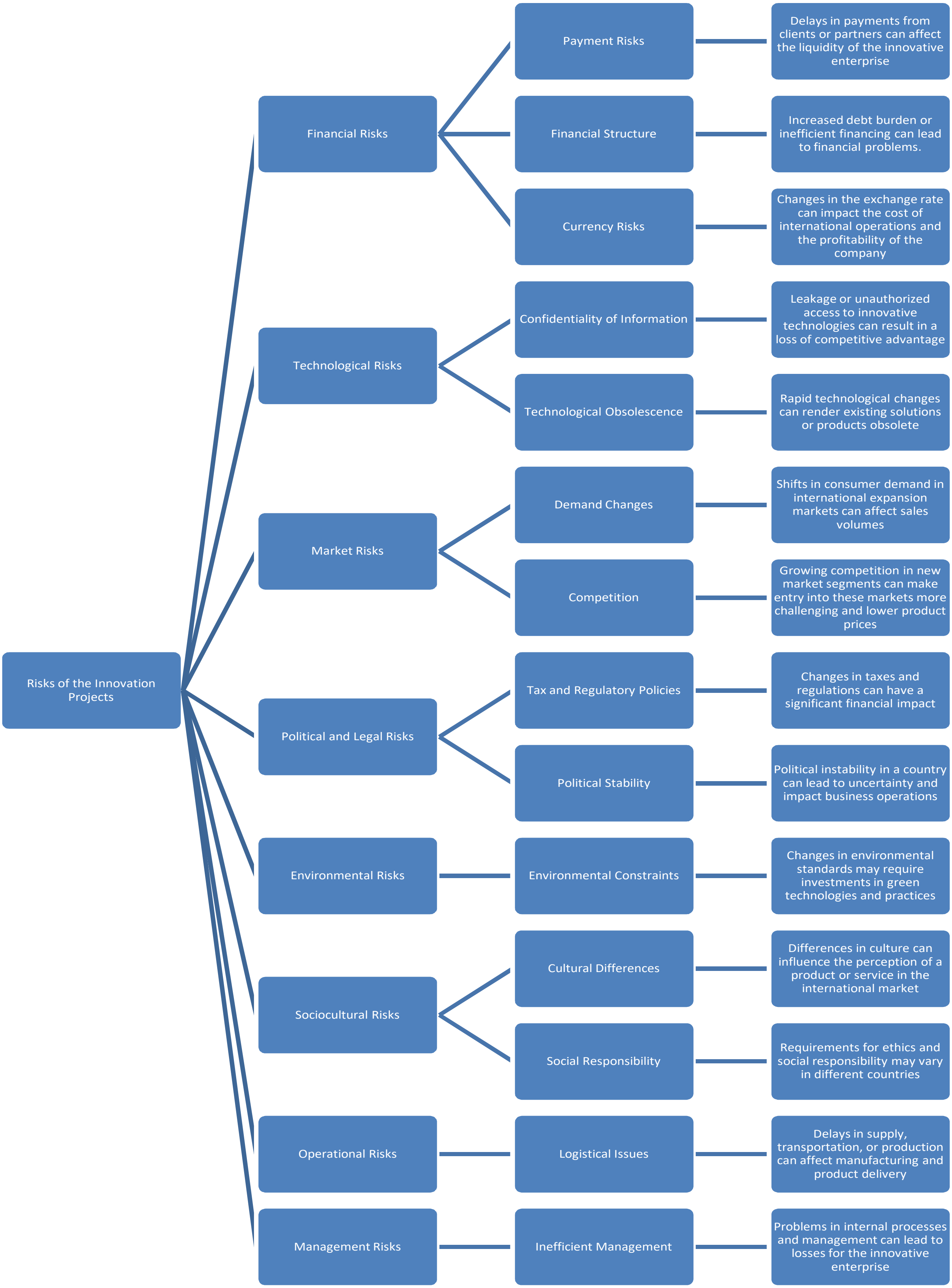
To analyze the results of the statistical data for risk management processes in international innovation projects, let's look at the provided indicators: Identified process, Risk assessment, Level of risk, and Implemented management process. We will analyze the trends and changes in these indicators over the years.

The indicator "Identified Process" seems to show variations over the years. It started at 9.4 in 2016, increased to 11.1 in 2018, and then gradually decreased to 10.1 in 2025. The peak value in 2018 might indicate an increase in the recognition and identification of processes related to risk management in international innovation projects. Risk assessment also shows fluctuations. It increased from 4.4 in 2016 to 7.7 in 2020, indicating a growing awareness of the potential risks. However, it then decreased to 3.2 in 2021, which might signify a period of reduced risk assessment. The level of risk demonstrates variations as well. It started at 5.1 in 2016, decreased to 2.9 in 2020, and then increased to 5.9 in 2025. The drop in 2020 suggests a period of lower perceived risk, followed by a gradual increase, possibly due to changing circumstances or emerging risks. The implementation of the management process shows fluctuations, starting at 8.5 in 2016, dropping to 7.4 in 2020, and then recovering to 11 in 2025. This indicates that the effectiveness of management processes initially decreased but then improved significantly over the years. Overall, it appears that there have been fluctuations and changes in the risk management processes for international innovation projects from 2016 to 2025. These changes may reflect shifts in the perception of risks, the identification of processes, and the effectiveness of management strategies. Further analysis and investigation into the causes of these fluctuations could provide valuable insights for improving risk management in such projects.

DISCUSSION

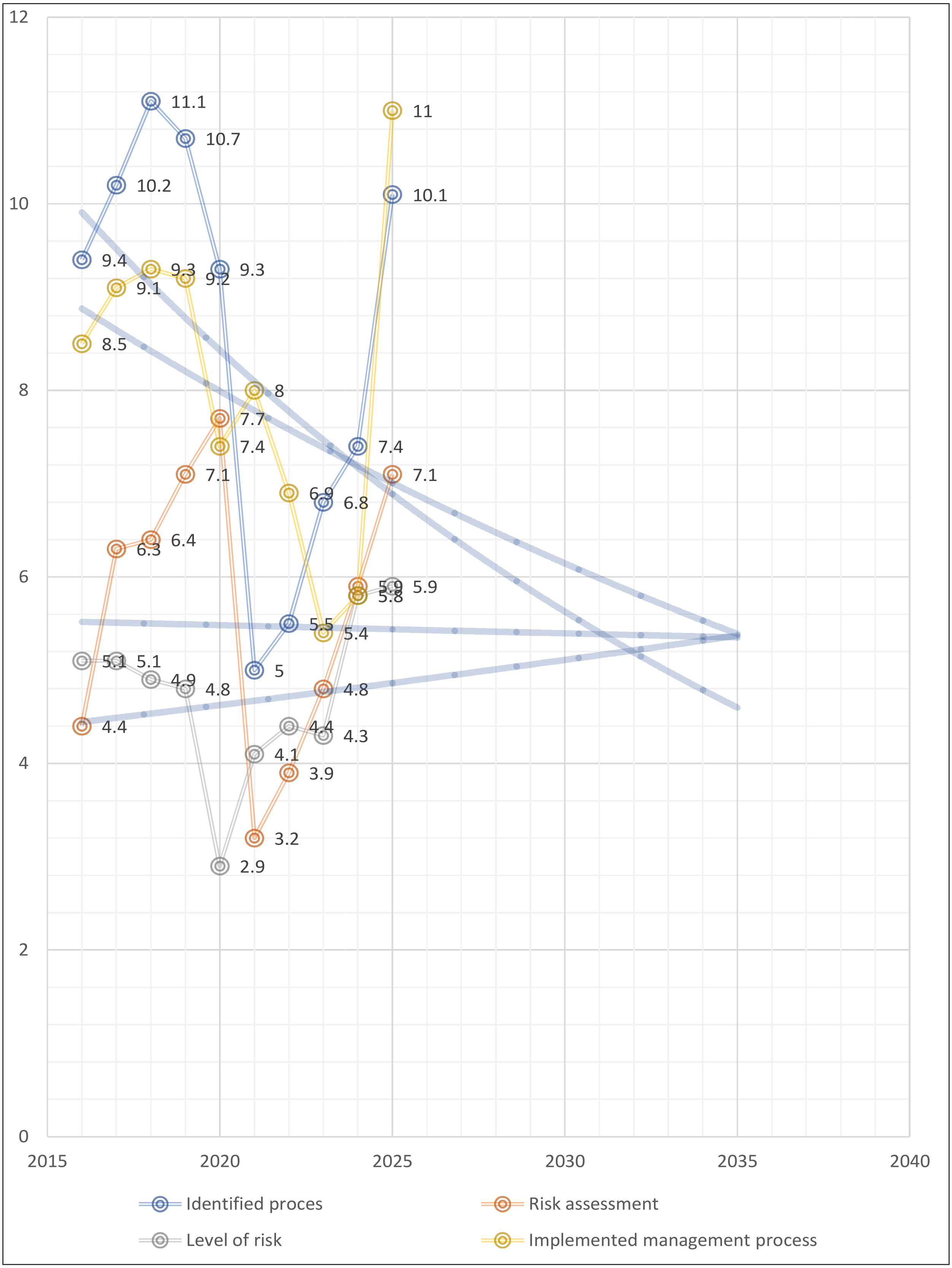
Discussion Points and Directions for Further Research:

- *Dynamic nature of risks:* The research has shown that the level of risks has varied over the years. Further analysis can focus on identifying the factors that led to these changes and the circumstances that influenced risks in different periods;
- *Causes of significant fluctuations*: It is crucial to determine why certain years witnessed



***Source:** Developed by the author.*

Fig. 1: The risks that affect innovative enterprises in the process of international expansion



Source: *Developed by the author.*

Fig. 2: Changes in risk management of innovation projects indicators

significant increases or decreases in risk assessments. This may be related to changes in internal or external factors;

- *Impact of external events*: The study can examine how external events (such as global crises or political events) have influenced risks and risk management strategies in international innovation projects;
- *Evaluation of responses to risk changes*: Assessing how innovative enterprises responded to shifts in risks and developing improved risk management strategies in the context of Industry 4.0;
- *Role of emerging technologies*: The research can analyze how new technologies, including smart systems and data analytics, affect risk management and whether they can help mitigate risks;
- *Cultural and social responsibility aspects*: Exploring the impact of cultural differences and social responsibility requirements on the success of international innovation projects;
- *Adaptation to technological advancements*: Examining how innovative enterprises adapt their risk management strategies to the rapid development of technologies and digital transformation;
- *Sector-specific risk analysis*: Detailing risks in specific sectors such as information technology, biotechnology, manufacturing, and others;

Analysis of global crisis impact. Investigating the influence of global crises, such as the COVID-19 pandemic, on risk management in innovative projects. These research directions can contribute to expanding understanding and improving risk management practices in international innovation projects in the era of Industry 4.0.

CONCLUSION

In this article, risks and their management in innovative international projects in the era of Industry 4.0 were investigated. The analysis results have shown that innovation has become an integral part of competitiveness for companies in the modern world. However, along with the significant potential of innovation, new risks emerge. Financial risks, such as currency fluctuations and financial structure, impact the profitability of innovative enterprises. Payment risks can affect liquidity, a key factor for the successful execution of international projects. Technological risks encompass technological obsolescence and information confidentiality, which can influence the competitive advantage of innovative products and services. Market risks are associated with changes in demand and competition in international expansion markets. Political and legal risks include political stability and tax policy. Socio-cultural risks arise from differences in culture and social responsibility requirements. Environmental risks are becoming more relevant due to changes in environmental standards. Operational risks, such as logistical issues, can affect production and product delivery. Management risks encompass inefficient management, which can impact the company's performance. Further research could delve into various risk management strategies in innovative international projects and their effectiveness. Technological solutions in risk management: exploring the impact of new technologies such as artificial intelligence and blockchain on risk management. The research may include an analysis of the influence of regulations and legislation on innovation risks.

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