

AI-driven transformation of business models: new opportunities for startups in the global marketplace

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DOI: 10.31364/SCIRJ/v12.i08.2024.P0824990

<http://dx.doi.org/10.31364/SCIRJ/v12.i08.2024.P0824990>

Abstract: This study examines the transformation of business models under the influence of AI, focusing on new opportunities for startups in the global market. Utilizing data from recent McKinsey reports, the research analyzes the rapid adoption of generative AI and its impact on innovation and competition. The study identifies key areas for AI-driven innovation, including personalized medicine, fintech, and sustainable technologies. It explores differentiation strategies for AI startups, emphasizing specialization, technology integration, and ethical AI development. The research highlights the critical importance of risk management in AI implementation, addressing challenges such as data accuracy, cybersecurity, and regulatory compliance. The findings reveal that successful AI integration requires a comprehensive approach, combining strategic vision, cultural adaptation, and ethical considerations. The study concludes that startups capable of balancing innovation with responsible AI practices are poised to lead in reshaping global business landscapes, contributing to both commercial success and societal benefit.

Keywords: artificial intelligence, business model transformation, startups, generative ai, innovation, ethical ai, risk management, technology adoption, digital transformation, competitive strategy.

1. Introduction

Artificial intelligence (AI) is rapidly transforming modern business, creating unprecedented opportunities for innovation and reshaping established business models. A key player in this technological revolution is generative AI (gen AI), a class of machine learning algorithms capable of generating new content, including text, images, code, and other data types, based on large-scale information training [3].

Generative AI is characterized by several key features:

1. Ability to creatively synthesize new information
2. High adaptability to various tasks and domains
3. Capability to process and generate natural language
4. Potential to automate cognitive tasks

Analysis of data from McKinsey reports for 2023 and 2024 reveals the rapid and significant growth in the adoption of generative AI in the business environment. In 2023, only 33% of surveyed organizations regularly used gen AI, while by 2024, this figure had risen to 65%. This increase indicates the business sector's recognition of the transformative potential of this technology [1,2].

It is important to note that the rise in generative AI adoption has contributed to the overall increase in AI technology implementation in business. According to reports, the overall AI adoption rate grew from 55% in 2023 to 72% in 2024 [1]. This trend suggests that generative AI acts as a catalyst for broader AI integration into business processes.

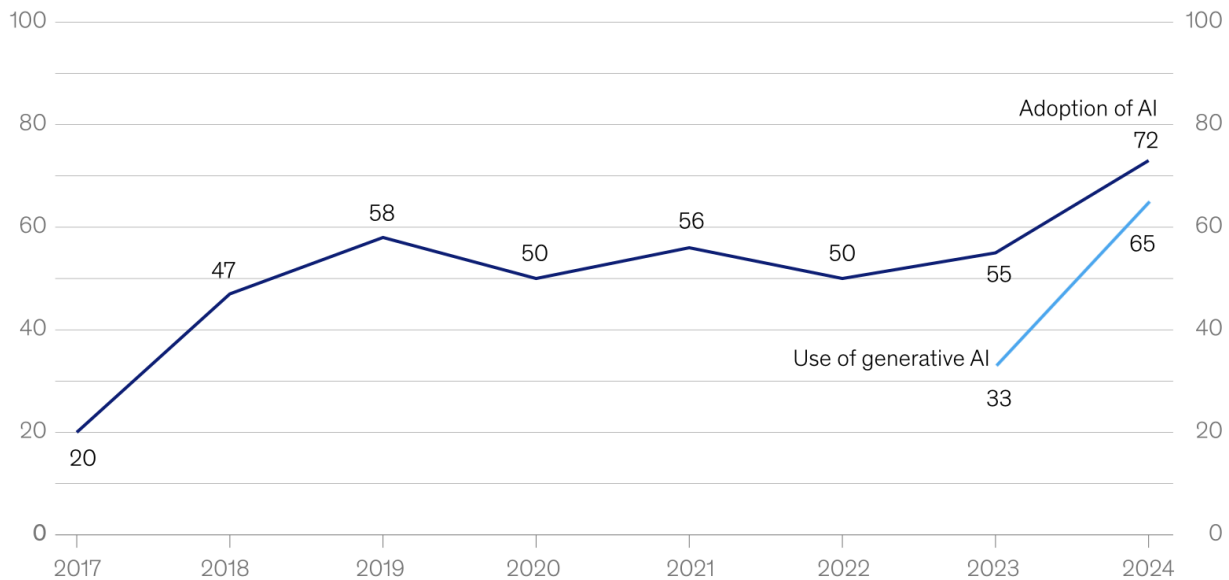
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<http://dx.doi.org/10.31364/SCIRJ/v12.i08.2024.P0824990>

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Organizations that have adopted AI in at least 1 business function,¹ % of respondents



¹In 2017, the definition for AI adoption was using AI in a core part of the organization's business or at scale. In 2018 and 2019, the definition was embedding at least 1 AI capability in business processes or products. Since 2020, the definition has been that the organization has adopted AI in at least 1 function.
 Source: McKinsey Global Survey on AI, 1,363 participants at all levels of the organization, Feb 22–Mar 5, 2024

Fig. 1. Dynamics of AI and Generative AI Adoption Growth (2023-2024) [1]

The impact of generative AI on business models and the creation of new opportunities for startups cannot be overstated. The technology paves the way for a radical rethinking of value creation processes, customer interaction, and operational management. According to a McKinsey report, 75% of respondents expect that generative AI will lead to significant or even disruptive changes in their industries in the coming years [1].

For startups, this technological revolution creates a unique window of opportunity. The flexibility and innovation inherent in startup culture enable young companies to quickly adapt and leverage the potential of generative AI to create breakthrough products and services. Key application areas for gen AI, such as marketing and sales, product and service development, and IT, provide fertile ground for innovation and differentiation in the global market.

However, alongside the opportunities, the implementation of generative AI also presents several challenges. Organizations must address issues related to data accuracy, cybersecurity, and regulatory compliance. These aspects become critically important factors when developing AI implementation strategies and transforming business models.

Amid the growing interest in generative AI, investment activity in this area is also gaining momentum. According to McKinsey, 67% of surveyed companies plan to increase their AI investments in the next three years. This trend creates a favorable climate for startups working in the AI technology sector, providing access to capital and resources for developing innovative solutions [1,2].

2. Transformation of Business Models under the Influence of AI

The integration of artificial intelligence (AI) into business processes is catalyzing fundamental changes in the structure and functioning of organizations, redefining traditional concepts of value creation [4]. This transformation affects key elements of business models: value proposition, operational processes, customer interaction, and monetization mechanisms.

Key application areas of generative AI (gen AI) in business are concentrated in three main directions: marketing and sales, product and service development, and information technology. These fields demonstrate the greatest potential for innovation and optimization [1,2].

In marketing and sales, gen AI revolutionizes approaches to personalization and automation of customer communications. Algorithms capable of generating contextually relevant content allow for highly accurate targeted campaigns tailored to individual consumer preferences. This leads to increased marketing investment efficiency and higher conversion rates.

In product and service development, gen AI accelerates innovation cycles by optimizing design and testing processes. Algorithms can generate and evaluate numerous design options, considering complex interactions between functionality, aesthetics, and manufacturing constraints. This enables companies to bring innovative products to market more quickly, better meeting the needs of the target audience.

In information technology, gen AI transforms software development processes by automating routine coding tasks and increasing developer productivity. Code generation, automatic testing, and algorithm optimization become key factors in accelerating business digital transformation.

The transformation of value chains under the influence of AI is characterized by the following key trends:

1. Decentralization of decision-making: AI systems integrated into various links of the value chain can autonomously make optimal decisions based on big data analysis, leading to increased overall efficiency and adaptability of business processes.

2. Hyper-personalization: The ability to process and analyze large volumes of consumer data allows for the creation of unique value propositions tailored to individual customer needs.

3. Predictive analytics: AI algorithms capable of forecasting trends and consumer behavior enable companies to proactively adapt their strategies and offerings, minimizing risks and maximizing opportunities.

4. Resource optimization: Intelligent resource management systems optimize production and logistics processes, reducing costs and increasing operational efficiency.

5. Automation of cognitive tasks: Gen AI can automate complex intellectual processes such as contract analysis, report generation, and strategy development, significantly enhancing productivity in the intellectual services sector [4].

Case studies of successful business model transformations using AI demonstrate a variety of approaches and potential outcomes:

1. Financial sector: JPMorgan Chase implemented the COiN (Contract Intelligence) system based on machine learning to analyze credit agreements. This automated work previously requiring 360,000 hours of manual labor by lawyers annually, significantly speeding up processes and reducing error risks.

2. Retail: Amazon implemented the Amazon Go store concept, using computer vision and machine learning algorithms to automate the shopping process. This transformed the customer experience and operational model of retail.

3. Manufacturing: Siemens uses AI to optimize production processes within the "digital twin" concept. This allows for modeling and optimizing production lines in a virtual environment, significantly reducing the time and cost of developing new products.

4. Healthcare: Babylon Health developed an AI system for preliminary diagnosis and patient consultation. This changed the primary healthcare delivery model, increasing accessibility and efficiency of healthcare services [1,2].

These examples illustrate how the integration of AI technologies can radically alter key aspects of business models, creating new sources of competitive advantage.

It is important to note that successful business model transformation under the influence of AI requires a comprehensive systematic approach. A key element is strategic vision, which involves a clear understanding of AI's role in the company's long-term strategy and its potential to create a unique value proposition. Equally important are cultural changes aimed at fostering a data-driven and innovation-oriented environment that encourages experimentation and continuous learning. Significant investments in developing technological infrastructure capable of supporting large-scale AI solution implementation are crucial. Developing competencies through the formation of interdisciplinary teams with deep knowledge in AI, data analytics, and industry specifics plays a critical role. Finally, ethical and responsible AI use, including the development and implementation of principles ensuring

transparency, explainability, and fairness of algorithmic decisions, becomes an integral part of the transformation. Integrating all these aspects creates the foundation for effective and sustainable business model transformation in the AI era.

The transformation of business models under the influence of AI opens new horizons for innovation and value creation. Organizations capable of effectively integrating AI technologies into their key processes and rethinking their business models gain a significant competitive advantage in the digital economy era. This process requires not only technological innovations but also a fundamental rethinking of approaches to creating, delivering, and monetizing value for customers [5].

3. New Opportunities for Startups in the Global Market

The revolution of generative AI (gen AI) is dramatically transforming the landscape of innovation and competition, opening unprecedented opportunities for startups in the global market. An analysis of high-potential market niches reveals several key areas where gen AI is becoming a catalyst for breakthrough changes [1,2].

In the field of personalized medicine, gen AI revolutionizes approaches to developing individualized therapies, analyzing genomic data, and predictive diagnostics, potentially transforming the healthcare paradigm.

The fintech sector is experiencing radical changes due to gen AI algorithms, which are redefining risk assessment methodologies, fraud detection, and the creation of personalized financial products.

Educational technologies relying on gen AI are implementing adaptive learning concepts, forming individualized educational trajectories, and potentially revolutionizing the learning process.

In the field of sustainable development, gen AI serves as a powerful tool for optimizing energy consumption and improving climate forecasting, contributing to the development of environmentally sustainable solutions.

The area of autonomous systems, from unmanned vehicles to industrial robots, is receiving new impetus for development thanks to gen AI's capabilities in decision-making and adaptation to complex environments.

These areas represent the frontier of innovation, where startups armed with gen AI technologies can not only create breakthrough solutions but also redefine entire industries.

Strategies for differentiation and creating unique value propositions for AI startups should be based on a deep understanding of market needs and technological capabilities. Specialization in narrow but critically important problem areas becomes a key success factor [6]. This approach allows startups to develop unique competencies and create significant entry barriers for competitors.

Building on this strategy, successful startups integrate generative AI with other breakthrough technologies. This synergy opens up opportunities for creating revolutionary solutions capable of transforming entire industries. However, as technological solutions become more complex, the importance of their ethical and responsible use increases.

The response to this challenge is the development of AI systems with a focus on transparency, explainability, and fairness. This approach meets growing ethical requirements and becomes a powerful market differentiator. Startups that integrate these principles into the core of their solutions gain a significant advantage in the eyes of consumers and regulators.

Moreover, to scale these ethical and innovative solutions, many startups are turning to a platform approach. Creating ecosystems for developing applications based on generative AI not only accelerates the dissemination of technology but also creates a sustainable ecosystem around the startup's product, strengthening its market position.

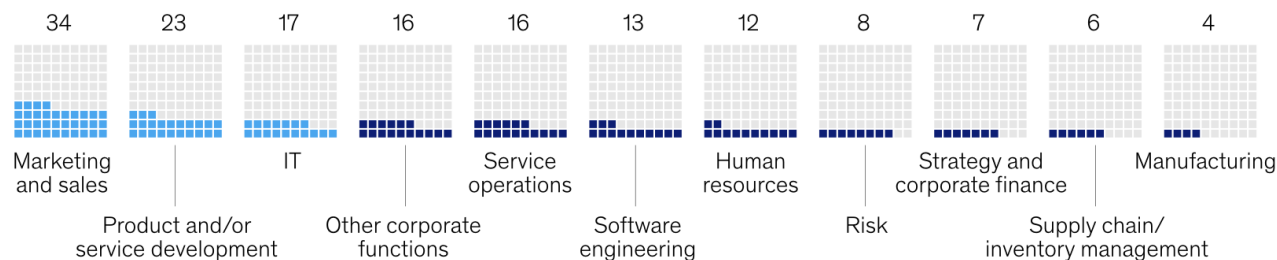
The logical conclusion of this strategic chain is the democratization of AI. Developing accessible tools and solutions for small and medium-sized businesses expands the potential customer base and promotes the acceleration of the digital transformation of the economy as a whole. This, in turn, opens new market opportunities for startups and enhances their role in shaping the future technological landscape [6].

Therefore, the role of customization of AI solutions in achieving competitive advantage is becoming critically important. According to McKinsey reports, highly efficient companies in the field of gen AI are more likely to use customized or entirely

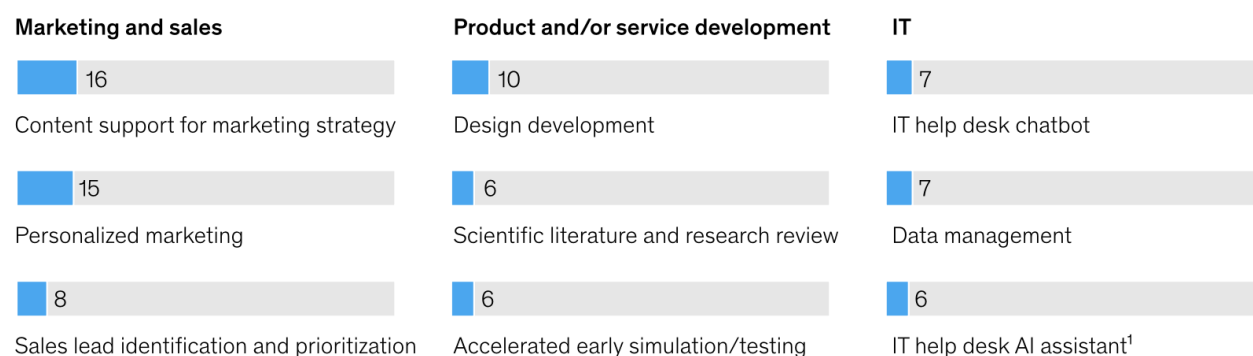
proprietary solutions rather than off-the-shelf products [1]. This underscores the importance of adapting AI technologies to the specific needs of businesses and industries.

To visualize the opportunities for startups in various industries, the following figure is proposed:

Respondents' organizations regularly using generative AI (gen AI), by function, % of respondents



Most commonly reported gen AI use cases within function, % of respondents



¹Eg, providing real-time assistance and script suggestions to help desk employees during human-to-human conversations.
 Source: McKinsey Global Survey on AI, 1,363 participants at all levels of the organization, Feb 22–Mar 5, 2024

Fig. 2. Matrix of Opportunities for AI Startups in Various Industries [1]

Figure 2 illustrates the potential applications of gen AI in various sectors, evaluating them based on two key parameters: the potential for business model transformation and the industry's technological readiness to adopt gen AI.

Key Success Factors for AI Startups in the Global Market:

1. **Deep Domain Expertise:** Successful startups combine AI technological competencies with a deep understanding of the specific industry they operate in.
2. **Focus on Scalability:** Developing solutions that can quickly scale globally is critical for attracting investments and capturing market share.
3. **Partnerships with Major Players:** Collaborating with established companies can provide access to data, infrastructure, and customer bases.
4. **Investment in R&D:** Continuous innovation and algorithm improvement are necessary to maintain a competitive edge in the rapidly evolving gen AI field.
5. **Focus on Data Quality:** Access to high-quality, representative data for training models becomes a key differentiating factor.

Investment trends analysis shows growing venture capital interest in AI startups. According to McKinsey, 67% of surveyed companies plan to increase AI investments in the next three years, creating a favorable climate for attracting funding [1].

However, startups working in the generative AI space face a complex set of interrelated challenges requiring a strategic approach to overcome them. The market is dominated by technological giants investing enormous resources in developing gen AI, creating intense competition for talent and market share. This factor intertwines with the technological complexity of developing and implementing advanced gen AI solutions, which require significant technical expertise and resources.

In parallel with technological challenges, startups face a dynamically changing regulatory landscape. Emerging AI legislation potentially creates additional market entry barriers and increases compliance costs. This regulatory uncertainty is compounded by the need to address complex ethical issues associated with the use of gen AI, including ensuring privacy, security, and assessing the social impact of technologies.

In an environment of high public and investor interest in gen AI, startups face the challenge of balancing ambitious goals with realistic expectations from investors and clients. Managing these expectations becomes critical for long-term success, requiring startups to possess not only technological expertise but also strategic communication and risk management skills.

To maximize the chances of success, startups in the generative AI space need a comprehensive strategic approach. A key factor is developing a culture of continuous learning and adaptation, allowing rapid response to rapid changes in the AI technology landscape. This cultural foundation should be combined with a clear focus on creating measurable value for clients, demonstrating specific business outcomes from the application of gen AI.

In parallel with technological development, investing in ethical and explainable AI systems becomes critically important. This aspect not only meets growing public and regulatory requirements but can also become a key differentiator in the long run. To strengthen their positions, startups should also actively participate in shaping the gen AI ecosystem by building partnerships with academic institutions, industry consortia, and regulators.

The foundation of a successful strategy should be the development of flexible business models capable of quickly adapting to dynamically changing technological and market conditions. This approach allows startups not only to survive in conditions of uncertainty but also to turn challenges into new opportunities for growth and innovation.

Integrating these strategic elements creates a solid foundation for the sustainable development of startups in the highly competitive and rapidly evolving field of generative AI, allowing them to effectively navigate technological, ethical, and market challenges [4-6].

4. Challenges and Risk Management Strategies in AI Implementation

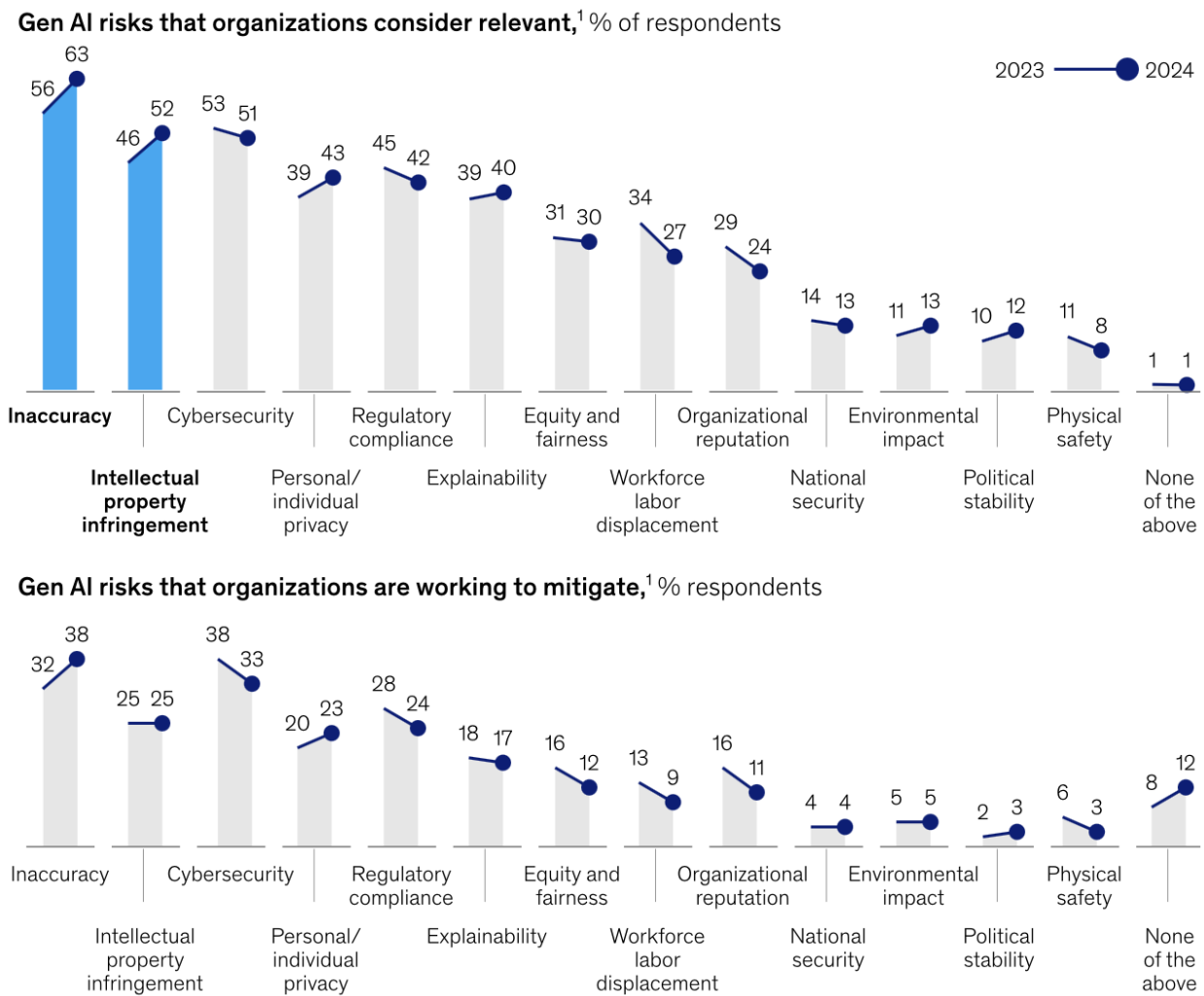
The implementation of artificial intelligence (AI), particularly generative AI (gen AI), is fraught with a complex set of risks that require a systematic management approach. Analysis of data from McKinsey reports identifies three key categories of risks: data inaccuracy, cybersecurity, and regulatory compliance. These risks represent not only technological but also strategic challenges for organizations deploying AI solutions [1,2].

Data inaccuracy is a primary risk highlighted by survey respondents. This issue is exacerbated in the context of gen AI, where the quality and representativeness of training data directly impact the accuracy and reliability of generated content. Inaccurate or biased data can lead to erroneous decisions, financial losses, and reputational damage.

Cybersecurity represents a second critical risk. AI systems, which process vast amounts of data, become attractive targets for cyberattacks. Vulnerabilities in AI models can be exploited to manipulate output data or extract confidential information.

Regulatory compliance becomes more complex in the context of rapidly evolving AI technologies. Regulatory bodies worldwide are developing new regulations aimed at ensuring the ethical and safe use of AI, creating additional compliance burdens for organizations.

To visualize the complex nature of risks associated with AI implementation, the following diagram is proposed (Figure 3).



¹Question was asked only of respondents whose organizations have adopted AI in at least 1 function. Respondents who said "don't know/not applicable" are not shown. In 2023, n = 913; in 2024, n = 1,052.
Source: McKinsey Global Survey on AI, 1,363 participants at all levels of the organization, Feb 22–Mar 5, 2024

Fig. 3. Interrelation of Key Risks in AI Implementation [1]

This diagram illustrates the interrelation between different types of risks and their potential impact on business processes and outcomes.

Best practices for risk management identified in "high-performing" companies in the field of gen AI include:

1. Integration of Risk Management into the AI Development Lifecycle:

- Applying a "shift left" approach to risk management, integrating risk assessment and mitigation in the early stages of AI solution development.

- Implementing continuous monitoring and risk assessment at all stages of the AI model lifecycle.

2. Creation of Interdisciplinary Risk Management Teams:

- Forming cross-functional teams including AI specialists, legal experts, ethics experts, and business unit representatives.
- Developing a culture of AI risk awareness among all employees of the organization.

3. Development of Robust Testing and Validation Systems:

- Implementing multi-level testing systems, including simulations of real-world use scenarios.
- Applying adversarial machine learning methods to identify vulnerabilities in AI models.

4. Ensuring Transparency and Explainability of AI Solutions:

- Developing mechanisms that allow for the interpretation of AI system decisions.
 - Implementing tools for auditing and tracking the AI decision-making process.
5. Investing in Data Quality and Security:
- Developing strict data management protocols, including data collection, storage, and usage.
 - Implementing advanced data anonymization and encryption methods.

To effectively manage risks in AI implementation, the following diagram is proposed (Figure 4).

Organizations engaging in each practice,¹ % of respondents

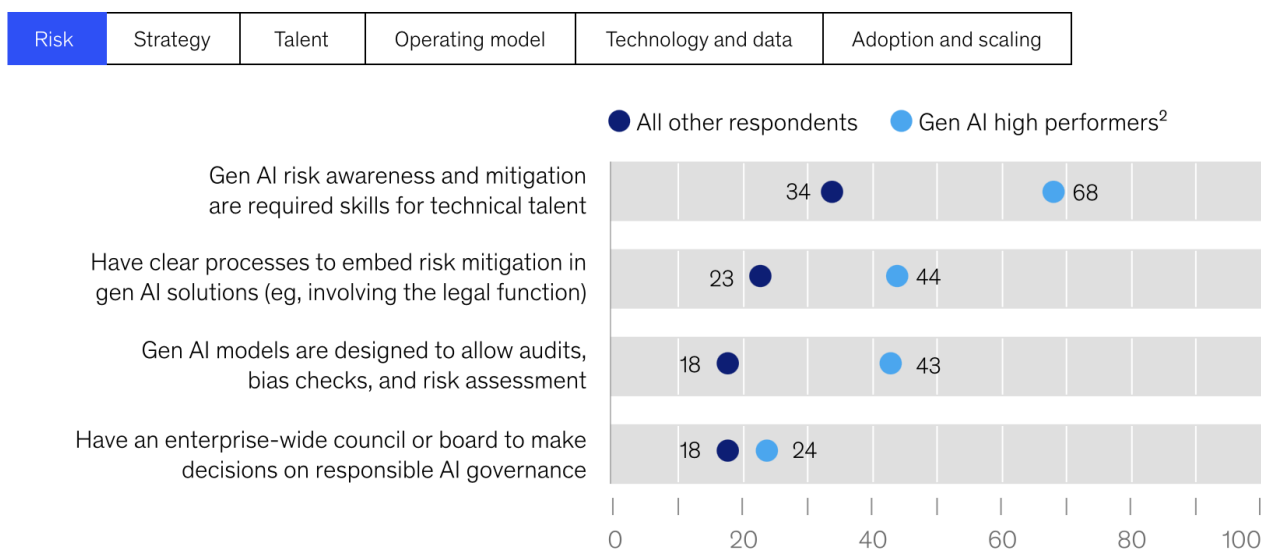


Fig. 4. Risk Management in AI Implementation in Startups [1]

Ethical aspects and a responsible approach to AI are becoming not merely desirable but critically necessary factors for the long-term success of startups in the field of artificial intelligence. The foundation of this approach lies in the principles of fairness and non-discrimination, requiring developers to deeply understand the social contexts and potential consequences of algorithmic decisions. This involves not only technical optimization but also interdisciplinary analysis, including sociological and anthropological aspects.

Transparency and explainability of AI systems are essential tools for building public trust in the technology. This necessitates the development of new methodologies for interpreting complex machine learning models, making them accessible not only to experts but also to the broader public.

Privacy and data security issues in the context of AI acquire a new dimension, considering the ability of modern algorithms to deeply analyze and synthesize information. This challenges startups to develop innovative approaches to data protection, going beyond traditional encryption and anonymization methods.

The principle of accountability in AI requires rethinking traditional models of corporate responsibility. Startups need to develop new governance mechanisms that can account for the unique characteristics of AI systems, such as autonomy and the ability to learn independently.

Finally, focusing on social utility implies integrating ethical considerations at the earliest stages of AI solution development. This requires startups to have not only technical expertise but also a deep understanding of contemporary social, economic, and environmental challenges.

Therefore, startups are recommended to implement the following practices to ensure ethical use of AI:

1. Develop internal ethical codes and guidelines for AI use.

2. Establish ethical committees to assess potential risks and social impacts of AI solutions.
3. Conduct regular audits of AI systems for compliance with ethical principles.
4. Invest in employee training on ethical AI principles.
5. Actively engage with stakeholders to consider diverse perspectives in AI solution development.

Risk management associated with generative AI (gen AI) requires special attention due to the unique characteristics of this technology. The ability of gen AI to create content indistinguishable from human-generated content introduces a complex set of interrelated challenges. The risk of generating misinformation or harmful content is coupled with potential copyright infringement when using training data. These technical aspects are inextricably linked with ethical issues arising from the imitation of human behavior by AI systems. The unpredictability and "creative" potential of gen AI exacerbate these risks, necessitating innovative approaches to mitigation.

Managing these specific risks requires a multi-level strategy. Implementing comprehensive systems for filtering and moderating generated content should be combined with the development of clear policies for the use of training data, taking into account legal and ethical aspects. The integration of human oversight mechanisms in key gen AI decisions is critical, requiring a rethinking of human-machine interaction interfaces. Developing protocols for testing gen AI for safety and ethics in various usage scenarios becomes an integral part of the development process, necessitating the creation of complex simulations and stress tests [7].

Thus, effective risk management for gen AI involves not only technical solutions but also the formation of a new paradigm for AI technology development, integrating technological, ethical, and social aspects into a unified risk management system.

5. Conclusion

In conclusion, the transformation of business models under the influence of artificial intelligence, particularly generative AI, opens unprecedented opportunities for startups in the global market while simultaneously presenting a complex set of challenges. Analysis of current trends shows a rapid increase in the adoption of generative AI, which is radically changing the landscape of innovation and competition across many industries.

Success in this new reality requires startups to possess not only technological expertise but also strategic vision, the ability to adapt quickly, and a deep understanding of the ethical aspects of AI application. Key factors for differentiation include specialization in narrow but critically important areas, integration of AI with other breakthrough technologies, and a focus on creating ethical, transparent, and explainable AI systems.

Risk management related to generative AI, including issues of data security, misinformation prevention, and copyright compliance, becomes particularly important. This necessitates the development of comprehensive strategies that combine technical solutions with ethical principles and mechanisms of human oversight.

The future of business in the AI era will be determined by the ability of organizations to effectively integrate these technologies into their business models, creating innovative value propositions while simultaneously addressing the associated ethical and social challenges. Startups that can find a balance between innovation, ethics, and sustainable development have a unique opportunity not only to achieve commercial success but also to make a significant contribution to shaping a future where technology serves the greater good of society.

References:

1. The state of AI in early 2024: Gen AI adoption spikes and starts to generate value. URL: <https://www.mckinsey.com/capabilities/quantumblack/our-insights/the-state-of-ai>
2. The state of AI in 2023: Generative AI's breakout year. URL: <https://www.mckinsey.com/capabilities/quantumblack/our-insights/the-state-of-ai-in-2023-generative-ais-breakout-year>

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<http://dx.doi.org/10.31364/SCIRJ/v12.i08.2024.P0824990>

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3. What is generative AI?. URL: <https://www.mckinsey.com/featured-insights/mckinsey-explainers/what-is-generative-ai>
4. Brock J. K. U., Von Wangenheim F. Demystifying AI: What digital transformation leaders can teach you about realistic artificial intelligence //California management review. – 2019. – T. 61. – №. 4. – C. 110-134.
5. Iansiti M., Lakhani K. R. Competing in the age of AI: Strategy and leadership when algorithms and networks run the world. – Harvard Business Press, 2020.
6. Obschonka M., Audretsch D. B. Artificial intelligence and big data in entrepreneurship: a new era has begun //Small Business Economics. – 2020. – T. 55. – C. 529-539.
7. Dwivedi Y. K. et al. Artificial Intelligence (AI): Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy //International journal of information management. – 2021. – T. 57. – C. 101994.