**УДК 658.155**

**Zhang Jin**

Master

Al-Farabi Kazakh National University

Almaty, Kazakhstan

# RISK MANAGEMENT STRATEGIES FOR INNOVATIVE PROJECTS IN THE CONTEXT OF DIGITAL TRANSFORMATION

**Abstract：** In the era of globalization and digital transformation, enterprises are increasingly leveraging emerging technologies such as cloud computing, big data, and artificial intelligence to enhance operational efficiency and market competitiveness. While innovation projects are crucial in driving digital transformation, they also entail significant risks across multiple dimensions, including technology, market demand, organizational culture, and regulatory compliance. This study explores risk management strategies for innovation projects in the context of digital transformation, aiming to provide a systematic methodology for enterprise managers to identify, assess, monitor, and mitigate risks effectively. By

integrating traditional risk management frameworks such as COBIT and ISO 31000 with agile risk management approaches, this research emphasizes the importance of proactive planning, technology risk mitigation, organizational adaptation, market responsiveness, human resource development, and legal compliance. The findings suggest that a comprehensive risk management framework can enhance the success rate of innovation projects and ensure sustainable corporate growth in a highly competitive market. This study not only contributes to theoretical advancements in risk management but also offers practical insights for enterprises navigating the challenges of digital transformation.

**Keywords：** Digital Transformation, Innovation Projects, Risk Management, Agile Risk Management, Enterprise Strategy

**Чжан Цзинь**

Магистр

Казахский национальный университет имени аль-Фараби

Алматы, Казахстан

# СТРАТЕГИИ УПРАВЛЕНИЯ РИСКАМИ ДЛЯ ИННОВАЦИОННЫХ ПРОЕКТОВ В КОНТЕКСТЕ ЦИФРОВОЙ ТРАНСФОРМАЦИИ

**Аннотация:** В эпоху глобализации и цифровой трансформации предприятия все чаще используют новые технологии, такие как облачные вычисления, большие данные и искусственный интеллект, для повышения операционной эффективности и конкурентоспособности на рынке. Хотя инновационные проекты имеют решающее значение для цифровой трансформации, они также сопряжены со значительными рисками по многим параметрам, включая технологии, рыночный спрос, организационную культуру и соблюдение нормативных требований. В данном исследовании рассматриваются стратегии управления рисками для инновационных проектов в контексте цифровой трансформации. Цель исследования - предоставить руководителям предприятий систематическую методологию для выявления, оценки, мониторинга и эффективного снижения рисков. Интегрируя традиционные системы управления рисками, такие как COBIT и ISO 31000, с гибкими

подходами к управлению рисками, данное исследование подчеркивает важность упреждающего планирования, снижения технологических рисков, организационной адаптации, реагирования на рыночную ситуацию, развития человеческих ресурсов и соблюдения правовых норм. Полученные результаты свидетельствуют о том, что комплексная система управления рисками может повысить уровень успешности инновационных проектов и обеспечить устойчивый корпоративный рост в условиях жесткой конкуренции на рынке. Данное исследование не только вносит вклад в теоретические разработки в области управления рисками, но и предлагает практические рекомендации для предприятий, сталкивающихся с проблемами цифровой трансформации.

**Ключевые слова:** Цифровая Трансформация, Инновационные Проекты, Управление Рисками, Гибкое Управление Рисками, Стратегия Предприятия

**Introduction**

In today's era of globalization and informationization, digital transformation has become the core driving force for change in all industries. With the rapid development of cloud computing, big data, artificial intelligence and other advanced

technologies, enterprises have embarked on the road of digital transformation, aiming to improve operational efficiency, enhance market competitiveness and develop new business models through technological innovation. This trend has not only reshaped the landscape of traditional industries, but also given rise to many new business models, with far-reaching impacts on the global economic structure.

In the wave of digital transformation, innovation projects, as the vanguard of change, carry the important mission of exploring the unknown and breaking through boundaries. However, innovation is often accompanied by high risks, especially in multiple dimensions such as technology, market, organization and law. Uncertainty in technology, rapid changes in market demand, adaptive challenges in organizational culture, and increasingly stringent compliance requirements collectively constitute the obstacles in the implementation of innovation projects.[1] In view of this, the purpose of this paper is to discuss in depth the risk management strategy of innovation projects in the context of digital transformation, aiming to provide a set of systematic methodology for enterprise managers to effectively identify, assess,

monitor and control all kinds of risks in the process of project implementation. Through scientific risk management, we can not only improve the success rate of innovation projects, but also lay a solid foundation for the sustainable development of enterprises, so as to maintain a leading position in the fierce market competition. This study not only has important theoretical value, but also has significant guiding significance for practice.

**Overview of Digital Transformation and Innovation Program**

Digital transformation, as an important strategic direction of current enterprise development, refers to the profound changes in business processes, products and services, organizational structure and culture through the adoption of emerging digital technologies, such as cloud computing, big data, artificial intelligence, etc., so as to achieve a significant improvement in operational efficiency, continuous optimization of customer experience, and comprehensive enhancement of market competitiveness. This transformation process involves not only technological innovation, but also a profound management revolution, which requires enterprises to fundamentally re-

examine and reconstruct their value creation system. Digital transformation is characterized by its comprehensiveness, continuity and disruption, which requires enterprises to strategically integrate digital technology into every aspect of enterprise development, and promote the transformation of operation mode from traditional linear and static to flexible and dynamic.

In this context, innovation projects have become the key carrier and core driving force of digital transformation. Innovation projects are usually technologically cutting-edge, and they tend to focus on the latest technological trends, such as blockchain, IoT, 5G communications, etc., and are committed to transforming these cutting-edge technologies into actual products or services, thus creating new growth points for enterprises.[2] In addition, rapid iterative nature is another distinctive feature of innovation projects. Driven by the acceleration of digital transformation, the market environment and technological trends are changing rapidly, and innovation projects must maintain a high degree of agility to continuously optimize product functions and service experiences through rapid trial and error and

continuous iteration to meet the rapid changes in the market. Cross-disciplinary cooperation is also an important manifestation of innovation projects in digital transformation. With the continuous integration and penetration of technology, the knowledge and skills of a single domain can no longer meet the needs of innovation projects. Therefore, innovation projects often need to cross multiple fields such as technology, market, management, etc., integrate resources and wisdom from different specialties, and form a synergy of collaborative innovation. This cross-discipline cooperation model not only helps to break down traditional barriers and promote the sharing and exchange of knowledge and technology, but also stimulates new ideas and inspirations and promotes the in-depth development of innovation projects.

There is a close and mutually reinforcing relationship between digital transformation and innovation projects. Digital transformation provides unprecedented innovation opportunities for enterprises and promotes the continuous emergence and rapid development of innovation projects; on the other hand, the successful implementation of innovation projects further accelerates the process of

digital transformation of enterprises and enhances the overall competitiveness and market position of enterprises.[3] Therefore, in the context of digital transformation, innovation projects are not only an important hand for the transformation and upgrading of enterprises, but also an important engine for promoting the continuous innovation and development of enterprises.

**Analysis of Major Risks Faced by Innovation Projects in Digital Transformation**

In the wave of digital transformation, innovation projects, as the key driving force for enterprise transformation and upgrading, and their successful implementation are of decisive significance for the long-term development of enterprises. However, this process is not a straight path, and innovation projects face multi-dimensional risk challenges in the implementation process.

Technology risk is the first and foremost challenge that cannot be ignored in innovation projects. Lack of technological maturity may lead to technical bottlenecks in the implementation process, making it difficult to achieve the expected results. At the same time, the rapid updating and iteration of technology makes the project face

the risk of obsolescence, and the initial investment may depreciate rapidly. In addition, data security and privacy protection issues are becoming more and more prominent, and any data leakage or privacy infringement may bring serious legal consequences and reputation loss to the enterprise. Organizational culture and management risks also warrant vigilance. A corporate culture that resists change will seriously hinder the advancement of innovation projects, making it difficult to get projects off the ground. Organizational structures that do not adapt to rapid change will affect the efficiency of decision-making and execution of the project. Inadequate leadership may lead to a lack of clear direction and strong impetus, resulting in slow progress or even failure.

Market and competitive risks are also challenges that innovation projects must face. Changes in market demand may cause the project's products or services to be out of step with market demand and lose market competitiveness. The fast response of competitors may make the project in the market in a passive position, difficult to occupy the first opportunity.[4] The uncertainty of market acceptance increases the

risk of project success and requires companies to have strong market insight and resilience. Human resource risks should also not be ignored. Talent shortages may lead to a lack of critical skills and experience in the project team, which may affect the effectiveness of the project. Skill mismatches can lead to ineffective collaboration among project team members, reducing project efficiency. Employee resistance to new technologies may lead to internal conflict, undermining the cohesion and execution of the project team. Legal and compliance risks are the bottom line for innovation programs. Increasingly stringent data protection regulations require organizations to strengthen data management and protection to avoid legal risks. Intellectual property disputes can lead to legal disputes, affecting an organization's ability to innovate and be competitive in the marketplace. The compliance challenges of multinational operations require enterprises to strictly comply with the laws and regulations of each country in the process of globalization to ensure compliant operations.

In summary, the risks faced by innovation projects in digital transformation are

complex and varied, requiring enterprises to have comprehensive risk identification, assessment and control capabilities to ensure the smooth implementation of projects and the sustainable development of enterprises.

**Application of Risk Management Theoretical Framework in Digital Transformation**

As a core component of enterprise management, the basic concept of risk management covers the four key aspects of risk identification, assessment, monitoring and control, aiming to reduce the impact of uncertainty on the achievement of corporate goals through a systematic process. In the context of digital transformation, the importance of risk management is particularly high, and it needs to be combined with specific frameworks and agile methods to adapt to the rapidly changing environment.

Traditional risk management tools, such as risk matrices and Monte Carlo simulations, provide an effective means of quantifying risk. However, digital transformation projects require a more refined management framework due to their complexity and uncertainty. the COBIT (Control Objectives for Information and

Related Technology) framework, which emphasizes information technology governance and control, provides a structured guide for information security management in digital transformation. The ISO 31000 Risk Management Principles and Guidelines provide a comprehensive risk management framework that applies to the entire life cycle of digital transformation projects, from strategic planning to implementation, ensuring the systematic and effective management of risk. In the face of the rapid iterative nature of digital transformation projects, the agile risk management methodology has emerged. The approach emphasizes user-centricity, rapid feedback and continuous improvement, and ensures that projects maintain flexibility while effectively controlling risks through an iterative risk management cycle. Agile risk management focuses on teamwork and encourages cross-departmental communication in order to identify and respond to risk changes in a timely manner, while using agile tools such as Kanban boards and burndown charts to visualize and make risk management transparent, ensuring that the project moves forward robustly in an uncertain environment.

In conclusion, combining the theoretical framework of risk management with the specific needs of digital transformation and adopting an agile risk management approach is the key to ensuring the success of digital transformation projects. This not only requires enterprises to have a deep theoretical foundation in risk management, but also to continuously explore and innovate in practice in order to adapt to the challenges and opportunities brought by digital transformation.

**Risk Management Strategies for Innovation Projects in the Context of Digital Transformation**

In the wave of digital transformation, innovation projects, as a key driver of enterprise transformation and upgrading, face multi-dimensional risk challenges for their successful implementation. In order to ensure the sound promotion of the project and the sustainable development of the enterprise, it is necessary to construct a set of comprehensive and systematic risk management strategies.

Pre-planning and prevention strategy is the foundation of risk management. During the project start-up phase, enterprises should comprehensively identify potential risks through in-depth research and expert consultation, and quantitatively

assess the risks using tools such as risk matrix. Based on the assessment results, a detailed risk mitigation plan should be formulated, and risk response strategies and responsible persons should be clearly defined to lay a solid foundation for subsequent risk management. Through adequate preparation in the early stages, enterprises can effectively avoid or reduce risks at the beginning of the project to ensure the smooth launch of the project.

Technology risk management strategy is the core of digital transformation project risk management. When selecting technology, enterprises should comprehensively consider the maturity, stability, compatibility, and future development trend of the technology, and avoid selecting technologies with short technology life cycles and insufficient support. During project implementation, establish a continuous monitoring mechanism to identify and resolve technical failures in a timely manner to ensure the stable operation of the project. At the same time, backup and recovery plans are formulated to ensure that in extreme situations such as data loss or system crash, business operations can be resumed quickly to minimize losses.

Organizational and cultural change strategies are critical to the success of innovation projects. Enterprises should actively promote the establishment of a cultural atmosphere that supports innovation, encourage employees to dare to try and fail, and form an open and inclusive innovation ecosystem. Optimize the organizational structure, break down departmental barriers, promote cross-departmental collaboration, and improve decision-making efficiency. Strengthen leadership training, enhance leaders' awareness of change and risk management capabilities, and ensure that the project moves forward steadily in a complex and changing environment.

Market-adaptive strategies help companies better respond to changes in market demand. Through rapid trial and error, enterprises can quickly find a suitable development path for themselves in the market.[5] Establish a user feedback loop, collect and analyze user opinions in a timely manner, and continuously optimize products and services. Adopt flexible pricing strategy, adjust the price according to the market demand and competitive situation, and improve market competitiveness.

Human resource development strategy is an important guarantee for innovative project risk management. Enterprises should strengthen employee training and re-education, enhance employees' professional skills and innovation ability, and ensure that the team has the ability to cope with complex challenges. Establish a diversified team to attract talents from different backgrounds to join and promote knowledge sharing and creative collision. Stimulate employees' motivation and creativity through a perfect talent incentive mechanism to provide talent protection for the successful implementation of the project.

Legal compliance and risk management are the bottom line that cannot be ignored in innovation projects. Enterprises should establish a compliance review mechanism to ensure that all activities of the project meet the requirements of laws and regulations. Utilize legal tools to protect intellectual property rights and maintain the core competitiveness of the enterprise. For enterprises with multinational operations, they also need to ensure the compliance of their international business to avoid legal risks and reputational losses caused by compliance issues.

To sum up, the risk management strategy for innovation projects in the context of digital transformation needs to cover various aspects such as pre-planning and prevention, technology risk management, organizational and cultural change, market adaptability, human resource development and legal compliance. By building a comprehensive and systematic risk management framework, enterprises can effectively deal with various challenges in the process of digital transformation and ensure the successful implementation of innovation projects and the sustainable development of enterprises.

**Conclusion**

In this paper, we have discussed the risk management strategy of innovation projects in the context of digital transformation, revealing the core points and effective strategies of risk management. We emphasize that pre-planning and prevention, technology risk management, organizational and cultural change, market adaptation, human resource development, and legal compliance constitute a comprehensive framework for innovation project risk management. The

implementation of these strategies not only helps enterprises effectively identify, assess and control risks in the process of digital transformation, but also enhances their innovation capability and market competitiveness. In the future, risk management strategies will face new challenges as technology continues to advance and markets change rapidly. For example, the widespread application of artificial intelligence, big data and other technologies may bring new technical risks; the trend of diversification and personalization of market demand will require enterprises to have stronger market adaptability and flexibility. Therefore, enterprises need to continuously update their risk management concepts and methods to adapt to new environmental changes.

For enterprise managers, risk management should be incorporated into enterprise strategic planning, and a long-term risk management mechanism should be established to ensure the sound promotion of innovation projects. At the same time, policy makers should also pay attention to risk management in digital transformation, formulate relevant policies and regulations, and provide enterprises with a favorable

external environment and policy support. Through the cooperation between government and enterprises, we can jointly promote the healthy development of digital transformation and inject new vitality into economic and social development.

**References**

1. Rauniyar K., Wu X., Gupta S., et al. Risk management of supply chains in the digital transformation era: contribution and challenges of blockchain technology // Industrial Management Data Systems. 2023. T. 123, № 1. C. 253-277.

2. Secundo G., Mele G., Passiante G., et al. How machine learning changes Project Risk Management: a structured literature review and insights for organizational innovation // European Journal of Innovation Management. 2024. T. 27, № 8. C. 2597-2622.

3. Brunetti F., Matt D. T., Bonfanti A., et al. Digital transformation challenges: strategies emerging from a multi-stakeholder approach // The TQM Journal. 2020. T. 32, № 4. C. 697-724.

4. Hrytsenko L., Boiarko I., Tverezovska O., et al. Risk-management of public-private partnership innovation projects // Marketing i menedžment innovacij. 2021. № 2. C. 155-165.

5. Mazunina M. V., Rubin A. G., Zinchenko N. V., et al. A risk-oriented approach to quality management during the implementation of innovative projects for company's strategic development: Ways to increase effectiveness // International Journal for Quality Research. 2021. T. 15, № 2. C. 417-434.