Research on Risk Management of Science and Technology R&D-based Enterprises from the Perspective of IS031000

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Abstract: With the rapid development of the economy, science and technology R & D-oriented enterprises are becoming more and more important to economic development. However, in the early stage of the development of science and technology R & D-oriented enterprises in their own development, the enterprises are often small in scale, limited in resources, and highly uncertain in the market and investment, which brings great risks to the science and technology R & D-oriented enterprises. Excellent risk management becomes one of the fundamental prerequisites for the survival and development of science and technology R&D-oriented enterprises. Taking IS031000 as a perspective, this paper discusses the risk management of science and technology R&D enterprises in depth from the aspects of the source, impact and management mode of risk, and also gives some methods and means to optimize the risk management on this basis.

Keywords: science and technology R&D enterprises; risk management; IS031000

1 Introduction

Science and technology research and development-oriented enterprises refer to those enterprises that make risky attempts to realize profits or achieve certain goals in the early stage of founding or in the process of development. Science and technology research and development-oriented enterprises face a variety of risks in the process of development, such as market risk, technology risk, financial risk, human resources risk and so on. These risks will not only affect the business performance of science and technology R&D-based enterprises, but also may lead to business failure. Therefore, how to effectively carry out risk management has become an urgent problem for science and technology R&D-oriented enterprises.

Since the beginning of the new century, "Double Creation" has inspired a large number of entrepreneurs to explore entrepreneurship and a large number of startups have emerged under the promotion of governments. Among these startups, science and technology research and development enterprises have become market favorites by virtue of greater risk investment and opportunity benefits. However, the problem is that these companies are often established for a short period of time, thin management experience, lack of investment stability, scale effect is not obvious or even basically absent. With the analysis of the 2018 Financial Report on China's Small and Micro Enterprise Services released by the People's Bank of China, the average lifespan of start-up science and technology research and development enterprises is less than three years, and less than 30% of enterprises with a history of more than three years are operating normally, with stable cash flow and a profit of 20%. From this, it can be seen that the survival period of science and technology R&D startups is shorter, the survival risk is obvious, and the risk management ability is weak. According to the above analysis, it is very necessary to introduce a mature and feasible risk management system.

2 ISO31000

The U.S. COSO organization first released the first edition of "Enterprise Risk Management Integration Framework" in 2004; the International Organization for Standardization also released the first edition of "Risk Management Guide" in 2009. More than a decade has passed, global politics, economy, society, technology and other huge changes have occurred, superimposed on the long-term impact of COVID-19, new risks and new opportunities emerge, enterprises should update the management thinking means to adapt to the risk management under different conditions.

By 2017, the U.S. COSO organization released the second edition of ERM "Enterprise Risk Management Shelf", and the International Organization for Standardization released the second edition of "Risk Management Guidelines" in the following year, i.e. 2018, that is, the new version of ISO31000. analyzing from the industry application, ISO31000 "Risk Management Guidelines" has been recognized by every country in the world, and has become a classic international Risk Management Theory.

In 2006, China issued the Guidelines on Comprehensive Risk Management for Central Enterprises, which was the first time for domestic enterprises to understand and recognize the comprehensive risk management system. Subsequently, under the guidance of the government, domestic central enterprises took the lead in implementing the comprehensive risk management system in their enterprises; in 2008, the Ministry of Finance issued the Basic Standard for Internal Control of Enterprises, and domestic large and medium-sized enterprises promoted the implementation of the Basic Standard for Internal Control of Enterprises; in 2009, China formulated its own risk management standard, GB/T24353-2009 "Risk Management Principles and Implementation Guidelines", on the basis of ISO31000, and it became the classic risk management theory internationally. In 2009, China formulated its own risk management standard GB/T24353-2009 "Risk Management Principles and Implementation Guidelines" based on ISO31000.

IS031000 is a risk management standard developed by the International Organization for Standardization (ISO), which aims to provide an effective risk management framework for organizations to help them identify, assess and manage risks. The standard emphasizes the importance of risk management for organizations

and proposes a series of risk management principles, methods and processes.

For science and technology research and development enterprises, drawing on the ideas and methods of IS031000, risk management can be carried out effectively to improve the competitiveness and viability of enterprises.

3 IS031000 Perspective Risk Management Framework

According to the definition of IS031000, risk management is a process rather than an objective, including risk identification, risk assessment, risk response and risk monitoring. For science and technology R&D-oriented enterprises, they can draw on this idea to build a risk management framework, including the following aspects:

3.1 Risk Identification

Risk identification is the first step in risk management. For science and technology R&D enterprises, risk identification needs to consider various sources of risk and measure them separately, which mainly includes the following aspects:

3.1.1 Strategic risk:

this type of risk is usually associated with the long-term development plan of the firm. It may arise from a change in CEO of the firm, layoffs, failure of new product development, mergers and acquisitions, etc.

3.1.2 Financial risk:

this risk is related to the financial position of the firm. It may include cash flow shortage, asset impairment, cost escalation, uncollectible accounts receivable, etc.

3.1.3 Market risk:

this kind of risk is mainly affected by the market environment, such as declining market demand, increasing competition, price fluctuations, etc.

3.1.4 Operational risk:

this kind of risk is mainly related to the daily operation and management of the enterprise, such as supply chain disruption, employee strikes, natural disasters and so on.

3.1.5 Legal Risk:

This kind of risk mainly stems from the enterprise's violation of laws and regulations or contractual agreements, e.g. tax violations, intellectual property infringement, etc.

3.2 Risk Assessment

Risk assessment is a very critical step in ISO31000. It involves quantitative and qualitative analysis of identified risks to determine the likelihood, degree of impact, and time of occurrence of each risk. Specifically, risk assessment can be carried out in the following steps:

3.2.1 Gathering information:

firstly, information related to the risk needs to be collected, including historical data, experts' opinions, industry standards, etc.

3.2.2 Analyze risk:

This information then needs to be analyzed to determine the likelihood of the risk, the degree of impact, and when it will occur.

3.2.3 Modeling:

Next, a risk assessment model needs to be built, usually using methods such as probability-impact matrix or sensitivity analysis.

3.2.4 Calculate Value at Risk:

Based on the model developed, the value at risk for each risk is calculated.

3.2.5 Prioritization:

Finally, the priority of each risk is determined based on the calculated value at risk to clarify which risks are to be prioritized.

It is important to note that the principles of systematicity, objectivity and dynamism should be followed in the risk assessment process. At the same time, good communication with stakeholders should be maintained to ensure that the assessment results can truly reflect the actual situation of the enterprise.

3.3 Risk Management

ISO31000 provides a complete set of risk management principles and framework to help organizations effectively manage and control various risks. According to ISO31000, risk management should be integrated into all aspects and all levels of the organization, not just a separate function or activity, and these activities are generally carried out in the following steps:

3.3.1 Define roles and responsibilities.

The organization needs to define as precisely as possible the people (or teams) and positions responsible for implementing risk management and to clarify the roles and responsibilities of each employee. Establish an organizational structure that can comprehensively cover risk management, including top management, middle management, and specific executives.

3.3.2 Develop a risk management strategy.

Enterprises need to define the organization's risk tolerance and risk appetite, and formulate corresponding risk management strategies. These strategies should be consistent with the organization's strategic goals and development direction.

3.3.3 Risk identification and assessment.

Through the collection of relevant information and the implementation of risk assessment procedures, identify the various risks faced by the organization, including risks from both internal and external sources; on this basis, the enterprise also needs to conduct qualitative and quantitative analyses of the identified risks to assess the extent of their impact on the organization and the likelihood of their occurrence.

3.3.4 Risk prioritization.

Enterprises need to prioritize all risks based on the results of the risk analysis, determine which risks need to be prioritized, and even adjust high-probability, high-threat risks to the front processing level, i.e., the project needs to be put on hold without completing the processing of such risks.

3.3.5 Develop risk response measures.

Enterprises based on risk prioritization, for each risk to formulate appropriate countermeasures, including avoidance, reduction, transfer and acceptance and other ways.

3.3.6 Implement risk control measures.

Based on the risk countermeasures developed, control measures are implemented to reduce or eliminate the risk. These measures may include changing processes, introducing new products or services, purchasing insurance, and so on.

3.3.7 Monitoring and review.

The enterprise needs to continuously monitor and review the implemented risk control measures to ensure their effectiveness. At the same time, experience and lessons learned in the risk management process are collected and analyzed in order to continuously improve and optimize the risk management strategy.

Overall, risk management under the ISO31000 framework is a systematic and dynamic process that requires full participation and continuous efforts from top to bottom of the organization. Through continuous improvement and refinement of risk management strategies, organizations can minimize and control risks to ensure sustainable and stable development and meet stakeholders' expectations.

4 Conclusion

Overall, the new version of ISO 31000 has made significant adjustments to the content of risk management. These adjustments are in addition to changes in content and wording, we need to make the following adjustments.

Enterprises need to define the core principle of risk management as value creation and protection, that is, risk management is an activity that facilitates value creation and protection, not a cumbersome, procedural aspect of management or a means for key personnel to avoid risk. Understanding and respecting the core definition of risk management can more effectively propel companies to strengthen or enhance risk management tools and methods.

Leadership and commitment are at the heart of risk management. This understanding can highlight the role and responsibility of leadership in risk management, and only when the top management really pays attention to the role of risk management can risk management be put into practice in the enterprise; parallel to this, risk management should be incorporated into the whole business process of the enterprise as a part of the organization's management, and become an indivisible part of the management of the whole enterprise.

Risk management is an activity and a process that requires continuous improvement. Because the internal and external environments faced by the enterprise are dynamic, the enterprise must adjust the risk management process according to the new information at any time.

The Risk Management Process Control section adds scope and guidelines for risk management. Because of the complexity of the organization's internal and external environments and the variety and scope of the risks it faces, the scope of the organization's risk management must be defined in order to effectively make risk decisions and manage risks. In addition, risk management guidelines are an extremely important element of risk management, and only when the organization's risk management guidelines are set correctly can the organization's risks be quantitatively assessed based on the guidelines. Risk management guidelines enable the organization's risk management to lead from qualitative judgment to more precise quantitative judgment, which is more accurate and effective.

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