

## On Obstacles of Sustainable Development and Government Support Behavior for Industry, Academy and Research Strategy Alliance

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**Abstract:** Strengthening Industry, Academy and Research (IAR) cooperation is an important part in promoting the industrialization of scientific and technological achievements and maintaining the industry's core competitive advantage. Industry, Academy and Research organizations alliances which are carried out smoothly or not, have great influence in the level of scientific and technological innovation in the relevant regions of a country. In this paper, with comparative analysis, case studies and other methods, Policies and recommendations are brought up on IAR sustainable development from government perspective. Government must improve the existing relevant laws and regulations, provide effective guidance, improve the policy environment, speed up service system building, and provide wider financial supports. In the meantime, government should strength supervision management on IAR strategic alliances development, so as to build a socialist harmonious IAR system.

**Keyword:** IAR (Industry, Academy and Research); Strategic alliance; Sustainable development; Government support

### 1 Introduction

After the global financial crisis, all governments in the world actively promote IAR alliance to accelerate the pace of technological innovation in order to find new economic growth point. As an important part of keeping industry core competitive advantage, IAR organization alliance smoothly working greatly influences the scientific and technological innovation of a country. In 2005, the Chinese government issued the "Long-term Scientific and Technological Development Plan (2006-2020)", which proposed clearly that we must establish a technology innovation system of "business-oriented, market-oriented, a combination of Industry, Academy and Research" and the system acts a national innovation system breakthrough and a key part to build an innovation country.

From the global point of view, the research of production IAR strategic alliances has existed for a long time. The earliest study on Research and Industry cooperation has been started in 1912 by USA economists Schumpeter. His book of "Theory of Economic Development" brought up the point that IRA cooperation process means renovation process, or production factors re-organizing process. During that process, enterprises, universities, research institutions carry out various forms of cooperation with innovation as a common goal. Committing to scientific research industrialization which integrates scientific research, technological development and marketing. The high benefits from such Integration will be much more than any party of three achieves individually. In the mid of 20th century, the father of Silicon Valley, Fred Terman proposed academy and industry partnership vision and initiated a regional economic development pattern, "Silicon Valley", which indicates a epoch in the history of Industry & research cooperation. In the 21st century, the study of IAR strategic alliances continues to refine. Gica (2004), from system perspective, pointed out three main components of IAR: Enterprise, School and Research Institute, together with external environment comprise a large system which origins from partners' needs and goals, and also from the pressure in the external environment. IAR's success or failure depends on its ability to survive and adapt to the environment, such as social and legal environment, etc.

In recent years, with the deep studies of IRA strategic alliance in China, we have made some achievements. The most studies focused on its necessity, feasibility and prospects; Issues appearing in economics transition period; proposals and ideas on IAR strategic alliance mechanisms, concepts, models and other aspects. In the paper of "Sustainable Development Joint mechanism for Industry, Academy and Research", Bi Kexin, Zhou Xinrong and others (1997) presented the issue that how IAR alliance can be carried out successfully. They discussed many aspects such as dynamic

mechanism, selection mechanism, risk mechanism, management mechanism, benefits mechanism, and legal mechanism. In 2005, Shanghai Municipal Committee of the Democratic Alliance described IAR current status and bottlenecks in the article of “Shanghai to promote production and research strategic alliance”, and gave proposals on how to form IAR strategic alliance effectively in Shanghai. Li Ying (2007) analyzed the characteristics of IAR alliance in high-tech zone, and gave some suggestions from government viewpoint. Chen Litai and Lin Chuan (2009) explored from government’s roles in macro-guidance and coordination, and pointed out a series of system construction, such as property rights system, evaluation system and incentive system etc.

In general, in-depth studies (and papers) on IAR strategic alliance in China are not found much, and even less on sustainable development in post-crisis era. This paper attempts to explore solutions that can suit China IAR strategic alliance sustainable development from government behavior perspective, so as to gain valuable results on IAR practice.

## **2 Sustainable Development Resistance after Initial Achievements**

### **2.1 Gradual improvements of macroeconomic conditions cannot effectively breakthrough information communication difficulties**

In the past twenty years, the macro-environment for IAR strategic alliance development is gradually improving in China, especially in the “Eleventh Five-Year” period, the central government has put great efforts on technological innovation environment improvement and has taken a series of effective measures to fully support enterprises to carry out technological innovation. Under the general framework of national laws and regulations on enterprise technological progress and innovation, local governments have set up science and education leading groups, science popularization leading group and leading groups of intellectuals. Moreover, local governments have stipulated associated support policies on the implementation of scientific and technological development outline, provided training in science and technology brands, technical standards and promoted Intellectual property creation and technological innovation projects, trying to create a favorable environment for innovative enterprises. However, the actual operation has shown that the communication obstacles among enterprises, universities and research institute are still outstanding.

### **2.2 The new cooperation mode is lack of continuance and steady**

In the past, research and educational institutions act as the main character in IAR cooperation, thus the school enterprise is the most popular mode of that. In a market economy, high risk in new enterprises increased the risk of technology industry, especially when universities owned new technologies in many areas, they established different school enterprises or run business diversification, they undertook even more risk. The schools and research institutions bear the full investment in technology industry which contributed to its greater financial pressure, leading to many sophisticated technologies died in the laboratory in universities.

In recent years, the new ideas on IAR cooperation is based on enterprise as a leader, together with universities and research institutions, to develop technology research and have research results in production. The outstanding advantages are: on one hand, avoiding resources waste and duplication work, which gives full play to the cooperation potential; on the other hand, those critical enterprises in the market cooperating with the universities which take leading role in technology can reduce the technology industry’s cycle, and avoid the disadvantages of those school-run enterprises.

IAR Strategy Alliance is a long-term stable and innovative cooperative organization that consisted of enterprises, universities and research institutes, and they based on their strategic objectives and strategic intent of the development to enhance innovation capacities. The new cooperation model allows the universities and research institutions to determine the relative clear research direction, strengthening research capabilities and market competitiveness to a certain level. However, most of IAR cooperation in china lacks of persistent and stability. Technological innovation and cooperation are harder to rise to a strategic high level.

### **2.3 Most of enterprises still lack the sense and capabilities of innovation, and investment amount**

In recent years, China’s strategic alliance implementation on industrial technology innovation has enhanced the overall technological level effectively on some relevant industries. The competitiveness of enterprises and development strength thereof has improved significantly. A Trinity Deer-style development IAR system has formed actively. However, behind those typical successful models on IAR alliance, a considerable number of enterprises, esp. small-middle enterprises (SME), their innovation

senses are not strong enough and innovation capabilities, investments are not sufficient. These factors limit the development space of IAR strategic alliance.

Most of Chinese enterprises with small-scale investment and poor corporate structure focus on tangible assets investments like plant and equipment etc., neglect of technology, talent and other intangible assets. In addition, insufficient capital investment on technological innovation will lead to enterprises unable or unwilling to bear big and challenge technological innovation projects, thereby affecting the IAR strategic alliance building. So far, it is still very difficult for some SMEs to obtain necessary financial support on innovative activities. Statistic has shown that more than 80% of the enterprises lack of R&D funding, and most of the creative talents distributed outside the enterprise. In IAR combination process, enterprise is basically at subordinate position.

### **3 Government Factor**

Multiple factors affect IAR strategy alliance promotion. As an important part of the national innovation system, complete legal protection and effective policy support are very essential.

#### **3.1 Legal system incomplete and related supervision not yet in place**

From the national level, the legal system for IAR strategic alliance development is not sound, especially the lack of a national laws and regulations on IAR strategic alliance. The lack of laws and regulations lead to much more difficulties in daily supervision work practice. At present, because IAR strategic alliance development only exist a short time, a specific daily supervision mechanism has not formed yet and insufficient supervision exist obviously. When IAR strategic alliance building up, contract can be used to specify capital investment and management, intellectual property rights allocation, liability for breach of contract and other important issues of interest. Whenever dispute occurs, all parties can resolve through consultation, so that IAR strategic alliance interests can be in timely and effective protection.

#### **3.2 Technology service system is not sound as innovation backing force**

Firstly, there is a lack of effective publicity mechanisms for IAR strategic alliance. The relevant government departments therefore do not produce more in-depth publicity and guidance on IAR strategic alliance related to the significance of economic and social, and preferential policies on enterprise, university and research institute. This is also the cause of most Chinese enterprises involved in IAR strategic alliances are not enthusiastic. Secondly, science and technology information exchange and service mechanism are not sound. Under Insufficient science and technology information situation, enterprise, university and research institute cannot understand with each other on their actual demand, resulting in big wastes in time, efforts and cost for all parties to find out the right strategic partners. Thirdly, the lack of contract management and technological innovation risk assessment mechanism. Contract, clearly stipulating the rights and obligations of all parties, is a legally binding protection for all IAR strategic alliance parties' interests. When dispute occurs in IAR strategic alliance, all parties can solve that through consultation in accordance with contract. Because of the lack of appropriate organizations, a mature contract management mechanism has not formed yet.

#### **3.3 Good policy environment and multi-channel input mechanism has not yet formed**

The Chinese government has not been yet successful in guiding the formation of multi-channel economic and social investment mechanism of technological innovation, and also cannot effectively solve the financial difficulties that enterprise, university and research institute are facing in their technological innovations. All these situations are not conducive to the sustainable development of IAR strategic alliances, thus will affect the enhancement process of scientific and technological innovation in China. At present, only a few large-scale enterprises engaged in innovation activities can obtain financial loans. Limited by risk guarantee factors, many enterprises cannot get sufficient loans to meet their technological innovation needs.

### **4 Policy Recommendations and Proposals for Sustainable Development of IAR**

Taking full account of Chinese enterprises, universities and research institutes actual situation, taking reference of the successful experience of developed countries and even the developed regions in China on IAR practice, the Government undertakes the corresponding responsibility to promote China's IAR Strategic alliance development.

#### **4.1 Establish and improve laws and regulations, strengthen supervision and management**

In order to achieve the desired results, the various IAR strategic alliances related regulations and policy must be carried out accurately and seriously. The Chinese government should strengthen its

supervision over the execution of the laws, regulations and policies (both national and local) to ensure that state such laws, regulations and policies can be implemented completely. Accountability mechanisms building up is another proposal that government make the appropriate punishments on those local or national units and their leaders which don't accomplish the assigned missions properly and timely. In the meantime, increasing the knowledge and technology property rights protection can ensure knowledge of return on investments (ROI) which can increase investors confidence on their investments on IAR strategic alliance.

#### **4.2 Create a favorable policy environment, and increase financial support**

The government financial supports on IAR strategic alliance are reflected in the following aspects. Firstly, set up special funds. Keep sustained and stable investment on key technology, fundamental technology and public technology. Secondly, broaden the sources of funds on technological innovation and gradually form a multi-participation investment system that is: government investment as a guide; enterprise investment as the main body; bank loans as support; fund raising and introduction of foreign capital as supplements. Thirdly, increase tax incentives on the enterprises involved in IAR strategic alliance by way of tax relief or tax subsidies etc. mobilizing the enthusiasm of enterprise participation on IAR strategic alliance.

#### **4.3 Strengthen the policy advocacy guide, speed up service system**

Strengthen publicity and guidance on IAR strategic alliance development. On the one hand, government departments hold regular training sessions, forums, information technology accomplishment conference and other forms of education and publicity, so that enterprises, universities and research institutes will be increased on their enthusiasm on IAR strategic alliance creation. On the other hand, summarizing advanced samples, promoting successful experience and effective mode on timely basis, guiding to learn the advanced experience and innovating methods of work are all effective and efficient ways to help promoting IAR strategic alliance development. For example, in developed provinces such as Jiangsu, "school-enterprise coalition" innovation activity as a form of IAR strategic alliance provides a way to serve the community with technology. Accelerate the establishment of contract management and risk assessment mechanisms. Contract and risk management are important factors that affect long-term development of IAR strategic alliance. The contract which addresses the various interests is the basis to handle disputes in IAR strategic alliance development process.

## **5 Conclusion**

After thirty years of exploration and development, China IAR strategic alliance has been a breakthrough in cooperation model and results, but further development is still facing outstanding obstacles. From the government perspective, there are these factors that impact china IAR strategic alliance development: unsound laws and regulations, insufficient supervision and management, policy support direction and intensity not being fully in place and imperfect cooperation service system etc. Furthermore, these factors produce a certain limitation on resource integration among enterprise, university and research institute. When China's economy is at an important period of strategic transition currently, extensive growth mode based on high consumption and investment of material resources has not fundamental change. To enhance independent innovation capability, maintain sustainable IAR strategic alliance development, accelerate the pace of economic development of independent innovation, government should provide targeted measures to deal with above three aspects of proposals as soon as possible.

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