# Dimensional Analysis and Empirical Study on the Factors affecting the Competitive Technical Intelligence Cooperation of R&D Alliance

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**Abstract.** The Competitive Technical Intelligence (CTI) cooperation is a process of resource restructuring, knowledge exchanging, mode innovation, and operation mechanism adjustment. Combing and analyzing the influencing factors of CTI cooperation would make for strengthening the management of intelligence cooperation and improving cooperation performance. Based on the function of CTI cooperation, this paper proposed the dimensions of resource adjustment, capacity aggregation and knowledge amalgamation, and provided scientific basis for the intelligence cooperation influencing factors analysis by structural equation modeling and empirical analysis.

## 1. Introduction

With the rapid progress of economic globalization and the rapid development of science and technology, as a valid use of external resources, cooperative research and development and improve the technological innovation capacity for the purpose of the strategic alliance-R&D alliance is increasingly becoming the most important of a coalition The R&D alliance is the basis for cooperation through cooperation to obtain resources, reduce risk and enhance the ability. Information cooperation is generally carried out through information exchange, organization and coordination, communication and cooperation, etc., through cooperation to achieve inter-agency information exchange, exchange of views and information transmission purposes.

## 2. Research theory and conceptual framework

As an open social organization system, the alliance cooperation organization will "absorb" the resources outside the organization and release the products or services to the outside. The process of organizing the operation is not only the process of integrating itself, but also constantly working with the outside world. Material, energy and information exchange process. From the development of resource basic theory, core competence theory and dynamic ability theory, the difference between enterprise profit and industry is related to the difference of resources, ability and knowledge.

R&D alliance as a cooperative organization, in the process of technical competition and intelligence cooperation, there will be strategic development as the goal of the complementary resources; in a certain organizational structure model, the convergence of the parties to the formation of new development capabilities , As well as information communication and knowledge exchange. Based on the motivation of the R&D alliance to carry out the cooperation of technology competitive intelligence, we divided the three aspects of resource integration, resource reengineering and knowledge reconstruction.

First, the resource integration. R&D alliance to carry out technical competition intelligence cooperation, is a certain material resources based on the formation of a new organizational structure. From the perspective of "structure - function", R & D alliance as a new organizational structure, alliance members are the node structure of the organization, this structure has the function of

resource acquisition or knowledge complements each other. Through the combing of the research literature, we believe that the resource integration dimension mainly includes human resources, economic security and technical conditions, which is the resource of human, financial and material in technical competition intelligence cooperation. Therefore, the R & D alliance of technical competition intelligence cooperation itself is through technology transfer agreement, franchise or resource technology sharing, etc. to achieve the transfer of technology and technology absorption.

Second, the ability to rebuild. The competency dimension of R & D alliance technology competition intelligence cooperation refers to the comprehensive embodiment and reflection of all individual abilities in carrying out competitive intelligence cooperation activities. Can stimulate individual potential, give full play to the organization function, through cooperation to achieve "1 +1> 2" effect, is involved in the organization's ability to aggregate, ability to re-generate, and then create the problem, through cooperation to produce greater cohesion and driving force The

Third, knowledge reconstruction. Strategic alliance is an important way of enterprise knowledge accumulation, strategic alliance for enterprises to carry out organizational learning provides a new way. Strategic alliance is an effective learning organization; the purpose of the formation of strategic alliance is to build an effective learning organization, the rapid accumulation of knowledge, the ability to quickly upgrade. Therefore, the key to the effectiveness of R & D alliance innovation is whether the enterprise can effectively stimulate the technical learning function of technical competitive intelligence, improve the search, identify the existing information and digest the ability to absorb and apply knowledge. The processing and analysis of technical competitive intelligence is the core of technical competitive intelligence work. The process of technology competition intelligence is the process of knowledge absorption, digestion, application and creation.
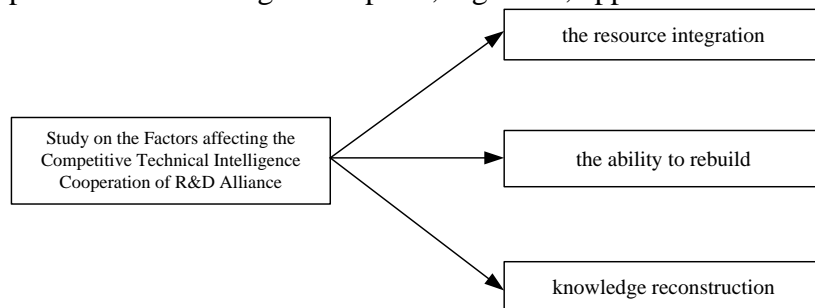


Figure 1. R&D alliance technology competition intelligence cooperation influencing factors dimension division theory framework

## 3. Research methods

### 3.1. Object of study

Data collection is mainly through the sampling and snowball sampling method to carry out the questionnaire survey, taking into account the technology-intensive large-scale enterprises will pay more attention to competitive intelligence and strategic management, so we selected enterprises mainly in the Yangtze River Delta region of high-tech enterprises, Biological medicine, environmental technology, textile and garment, IT technology and iron and steel industry and other industries. The survey is mainly targeted at high-tech enterprises in the technical competitive intelligence professionals, technology research and development personnel and senior managers. A total of 436 questionnaires were distributed by telephone, e-mail, face-to-face interviews, and 372 were recovered. The recovery rate was 85.3%. Among them, 358 valid questionnaires were used for this study. 82%.

### 3.2. Variable Measurement of Influencing Factors of Technical Competitive Intelligence Cooperation

In this study, the relevant variables were measured in the form of the Rickett seven scales. The measurement of the resource integration dimension is measured from three aspects: human resources, economic security and technical conditions, including 11 measurement indicators. "Specialized, high-quality professional intelligence team is the key to the quality of technology

competitive intelligence products," "special technical competitive intelligence investment to carry out technological competitiveness of information has a huge role in promoting", "advanced technology competitive intelligence System is more conducive to carry out technical competition intelligence work "and so on. The research of knowledge reconstruction dimension is based on the research of Zhou Yuquan, Zhou Jiuchang and Ding Ting et al., Which includes three aspects: information sharing, knowledge transfer and internalization, and a total of nine measurement items. Or informal communication can effectively improve the performance of technical competition and cooperation, "" similar technical and R & D areas are similar R & D alliance to carry out technical cooperation in the field of information intelligence cooperation, "inter-organizational learning and understanding often determines the technical competitiveness of information cooperation Success or failure "and so on.

## 4. data analysis

### 4.1. Reliability Analysis and Validity Test

Table 4. Each subscale of the KMO sample measure and the Bartlett sphere test results (N = 358)

| Potential variable | measurement standard | KMO value | Bartlett Sphere test | | Overall KMO value | Overall Bartlett Sphere test | |
|---|---|---|---|---|---|---|---|
| | | | Chi square value | Significance probability | | Chi square value | Significance probability |
| | Human Resources | .813 | 647.77 | .000 | .918 | 2099.603 | .000 |
| Resource Integration | Economic security | .720 | 465.00 | .000 | | | |
| | Technical conditions | .802 | 544.23 | .000 | | | |
| | Strategic orientation | .841 | 637.76 | .000 | | | |
| Ability to rebuild | Organizational learning | .821 | 1186.52 | .000 | .852 | 2639.348 | .000 |
| | Individual incentives | .709 | 620.31 | .000 | | | |
| | Information Sharing | .714 | 429.81 | .000 | | | |
| Knowledge reconstruction | Knowledge transfer | .707 | 431.89 | .000 | .902 | 1735.683 | .000 |
| | Absorb internalization | .716 | 430.77 | .000 | | | |

In this study, the Cronbach's $\alpha$ value is evaluated for the questionnaires corresponding to each measurement variable. The results of the reliability test of the influencing factors of the R&D alliance show that the Cronbach's $\alpha$ coefficients of the latent variables are more than 0.8, which is in accordance with the Cronbach's $\alpha$ value, 0.7, Item-Total correlation coefficient is greater than 0.35, and the value of the variable after deleting the variable is smaller than the Cronbach's $\alpha$ coefficient of the subscale. The overall Cronbach's $\alpha$ coefficients of resource integration dimension, ability reengineering dimension and knowledge reconstruction dimension are 0.895, 0.857 and 0.887 respectively. All the scales established in this study meet the reliability requirements.

In this study, the principal component method was used to carry out the factor rotation according to the large variance method, and the factor extraction was carried out according to the criterion of the eigenvalue greater than 1. When the factor load of the measured item is more than 0.5 and the proportion of the cumulative explanatory degree is more than 50%, it is considered that the variables are effective if the latent variable of the multi-item is consistent with the requirement of

structural validity.
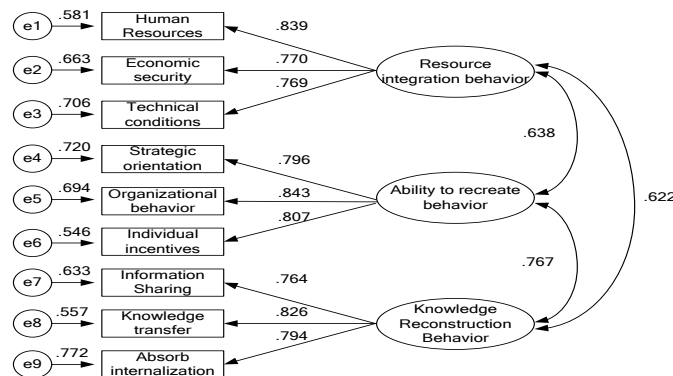
## 4.2. Structural equation model validation



Figure 2. R&D alliance technology competition intelligence cooperation influencing factors dimension structure model effectiveness measure

Through the analysis of the three factors of the integration of resources, the ability reengineering and the knowledge reconstruction of the R&D alliance, the structural goodness index of the structural equation model is: $\chi^2/df=2.331$, which is between 2 and 5 AGFI = 0.826, greater than the recommended standard value of 0.8; RMSEA = 0.029, less than the recommended standard value of 0.08; the ratio of the standard to the recommended standard value of 0.9; AGFI = 0.826, greater than the recommended standard value of 0.8; RMSEA = 0.029, less than the recommended standard value of 0.08; The measurement index of each dimension is close to the ideal value, which indicates that the division and measure of the three dimensions of resource integration, ability reengineering and knowledge reconstruction of R & D alliance technology competition intelligence cooperation are effective.

## 5.Summary

Based on the analysis and analysis of the relevant literatures on the influencing factors of R&D alliance technology competition, this paper uses the SPSS and AMOS software to carry on the empirical test according to the enterprise interviews and the questionnaire survey. The results show that the dimension structure of the R&D alliance technology competition intelligence cooperation factor can be divided into Resource integration, ability reengineering and knowledge reconstruction.

There are many binding conditions, such as the size of the organization of R&D alliance, the intelligence ability of both parties and the difficulty of information demand. The analysis of influencing factors of technology competition intelligence cooperation is a complex subject, to study the influence of various factors and mechanism of action under certain control conditions.

## References

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