

# Research on Strategic Alliance and Enterprises' Open Innovation

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**Abstract.** With the development of the economy and the deepening of cooperation, the strategic alliance has become an important means to improve the competitiveness of enterprises. Open innovation has been a hot spot for many scholars in recent years, but few scholars have conducted empirical research on the two. Therefore, this paper combines open innovation and strategic alliance to analyze the relationship between them, study the relationship between the two, put forward 8 hypotheses, form a conceptual model, and obtain data through a questionnaire and use SPSS software to analyze the data. The results show that the strategic alliance can positively affect the open innovation of the enterprise and put forward the relevant information. Suggestions are made to speed up the process of enterprise innovation.

## 1. Introduction

Due to the widespread use of the Internet, knowledge diffusion has become more rapid, and the innovation environment facing enterprises has become more difficult, and the competition among enterprises has become more intense. It is difficult for a single company to bear the huge R&D risk and R&D funds, and it is difficult to have all the resources for development. Therefore, strategic alliances become an inevitable choice for companies to achieve strategic goals and maintain or enhance their competitive position. With the rise of the alliance, enterprises are no longer fighting alone, but are strategic alliances, tactical cooperation with other companies, group operations, and mutual benefits [1]. Since Chesbrough proposed an open innovation paradigm in 2003, open innovation has become a hot issue in academic research in the field of innovation and management [2]. And in the field of innovation, strategic alliances have gradually become a hot topic in open innovation. Studies have shown that after the enterprise strategic alliance, the league enterprise each other in resources, advantages, culture, system, knowledge and so on various aspects of synergy and learning, the union enterprise continuously the pursuit of better and faster than its competitors to meet market demand, resulting in profits and the stability of open innovation ability [3]. Therefore, the purpose of this paper is to study how companies achieve open innovation through strategic alliances and how strategic alliances promote open innovation in enterprises.

## 2. Research Hypothesis

In the process of innovation, enterprises can choose to cooperate with suppliers, users, scientific research institutions, government agencies, distributors, competitors, and other institutions and individuals through the alliance. Through the alliance, the borders of the enterprises are gradually blurred, which can be beneficial to the development of the enterprise. Innovation of various resource information is conducive to the company's open innovation.

In open innovation, companies can acquire the technology and creativity required by their R&D through alliances with suppliers, competitors, scientific research institutions, etc. with innovative resources. Therefore, these participants are attributed to the alliance entities related to R&D. Enterprises through alliances with users, non-related companies, venture capital ventures, and governments, etc., to obtain market information, product marketing promotion, and capital and policy support, are conducive to maximizing the interests of enterprises, so these alliances will be Called the business-related alliance main body.

In open innovation, enterprises not only need to acquire innovation resources to conduct R&D and production, but also need to commercialize products to gain profits. This article believes that in a strategic alliance, companies can obtain market information, technological innovation, capital support, business operations, etc. Various resources, which in turn promote the open innovation of enterprises, that is, the open innovation of enterprises can be measured by the above four parts, thus making the following assumptions:

H1: Alliance entities related to R&D (suppliers, competitors, research institutes) have a positive effect on market information.

H2: Alliance entities related to R&D (suppliers, competitors, research institutes) have a positive impact on technological innovation.

H3: Alliance entities related to R&D (suppliers, competitors, research institutes) have a positive impact on capital support.

H4: Alliance entities related to R&D (suppliers, competitors, research institutes) have a positive impact on business operations.

H5: Business-related alliance entities (users, non-related companies, venture capital ventures, and government) have a positive effect on market information.

H6: Business-related alliance entities (users, non-related companies, venture capital ventures, and government) have a positive impact on technological innovation.

H7: Business-related alliance entities (users, non-related companies, venture capital ventures, and government) have a positive impact on capital support.

H8: Business-related alliance entities (users, non-related companies, venture capital ventures, and government) have a positive impact on business operations.

### 3. Research Design

#### 3.1 Research Sample and Data Collection.

This article adopts the Likert 5 scale form, through the online distribution of 100 questionnaires, removing 30 invalid questionnaires, and obtaining 70 valid questionnaires, the recovery rate is 70%. The nature of the surveyed enterprises includes state-owned enterprises, private enterprises, joint ventures, and other types of enterprises. In this paper, the scale of enterprises is the controlling variable, which is divided into 10-50 people with 14.29%, 50-150 people with 34.29%, 150-400 people with 34.29%, and more than 400 people. The proportion is 17.14%.

#### 3.2 Reliability and Validity Analysis.

This paper uses SPSS19.0 to analyze the data. Firstly, the reliability and validity of the questionnaire data are analyzed. The reliability analysis results of the scale are shown in Table 1. The value of Cronbach's  $\alpha$  is 0.856, which is greater than 0.7, indicating that the scale has good reliability.

Table 1. Reliability Statistics

Cronbach's Alpha	number
.856	21

Exploratory factor analysis of data using SPSS19.0. Results the KMO was 0.775, and the Bartlett hemisphere test was significant at the  $p < 0.001$  level. See Table 2 for the data suitable for factor analysis.

Table 2. Testing by KMO and Bartlett

Kaiser-Meyer-Olkin metrics		.775
Bartlett's sphericity test	Approximate chi-square	551.165
	df	171
	Sig.	.000

Therefore, for its confirmatory factor analysis, in order to simplify the data, it first simplifies the 12 measurement contents of its four variables technical innovation, commercial operation, market information, and technical support, and uses its average score to calculate, confirmatory factor analysis. The results show that the load of each variable factor is basically greater than 0.5, and the

factor load of only one measurement item is above 0.4 and close to 0.5, indicating that the validity of the questionnaire is appropriate.

### 3.3 Correlation and Linear Regression Analysis.

In this paper, there are three and four measurement options for the alliance-related subjects and R&D-associated union subjects in the variable management business. To simplify the analysis, the principal component analysis of the options in these two variables was first performed with SPSS19.0, and the main components were extracted before subsequent analysis. Firstly, the principal component analysis of the business-associated coalition subject is shown in Table 4. Through the principal component extraction method, a principal component is extracted. Component 1 accounts for 55.051% of the total explanatory variance. Therefore, component 1 is selected, the user performs the subsequent analysis as the main component.

Table 3. Principal component analysis of the main bodies of business alliances

Ingredient	Initial feature value			Extract square and load		
	Total	Variance%	Accumulation%	Total	Variance%	Accumulation%
1	2.202	55.051	55.051	2.202	55.051	55.051
2	.840	20.988	76.038			
3	.541	13.531	89.570			
4	.417	10.430	100.000			

For principal components analysis of R&D-related coalition bodies, see Table 5. Two principal components were extracted by the principal component extraction method. Component 1 accounted for 42.70% of the total interpretation variance, and component 2 accounted for 34.402% of the total interpretation variance. The cumulative total is 77.103%, which selects component1 and component 2, scientific research institutions and suppliers as the main components for subsequent analysis.

Table 4. Principal component analysis of R&D-related alliance subjects

Ingredient	Initial feature value			Extract square and load		
	Total	Variance%	Accumulation%	Total	Variance%	Accumulation%
1	1.281	42.700	42.700	1.281	42.700	42.700
2	1.032	34.402	77.103	1.032	34.402	77.103
3	.687	22.897	100.000			

Through the principal component analysis, this paper studies the alliance subjects related to the management of variables and the main body of R&D related alliance, and selects the users, scientific research institutions and suppliers as the main body of the alliance to carry out the correlation analysis. The descriptive statistics of variables are shown in Table 6. It can be seen from the table that the mean distribution of all key variables is between 1.82 and 2.39, and the standard deviation is between 0.57 and 0.82, indicating that the measurement of each variable has a high stability.

Table 5. Descriptive statistics

	mean value	standard deviation	N
User	2.2143	.72016	70
Scientific research colleges and universities	1.8286	.81599	70
Supplier	2.2571	.67428	70
Technological innovation	2.1757	.63141	70
Business operation	2.3400	.57089	70
Market information	2.2300	.58467	70
Capital support	2.3900	.62650	70

The correlation analysis for each variable is shown in Table 7. From the Pearson correlation coefficient, it is found that the user is significantly related to the level of  $p < 0.01$ , including technical innovation, business operation, market information and capital support. From the Pearson correlation coefficient, it can be seen that research institutes and suppliers and other subjects related to R&D are basically related to technological innovation, business operation, market information and capital support at the level of  $p < 0.05$ . After verifying the correlation between the variables, a linear regression analysis is carried out. The results are shown in Table 8, Sig is less than 0.05, indicating that the level of  $p < 0.05$  is significant. It is assumed that H1, H2, H3, H4, H5, H6, H7, H8 are all

verified, indicating that the strategic alliance can affect enterprise open innovation. It also shows that the alliance of enterprises with R & D related subjects and business-related subjects can promote the open innovation of enterprises through the way of obtaining technical innovation, business operation, market information and the way of supporting capital.

Table 6. Correlation coefficient

		Technological innovation	Business operation	Market information	Capital support
User	Pearson	.324**	.300**	.322**	.406**
	Significant.	.003	.006	.003	.000
Scientific research colleges and universities	Pearson	.428**	.254*	.254*	.354**
	Sgnificant.	.000	.017	.017	.001
Supplier	Pearson	.233*	.297**	.260*	.421**
	Significant.	.026	.006	.015	.000
N		70	70	70	70

Table 7. Linear regression coefficient table

	B	Standard error	Standard coefficient	t	Sig.
User	.242	.067	.372	3.595	.001
Scientific research colleges and universities	.201	.059	.350	3.386	.001
Supplier	.229	.070	.330	3.298	.002

## 4. Suggestion

### 4.1 Choose the Right Alliance Partner.

Formed an alliance to a series of choices and decisions, screening the right partners is a critical first step, enterprise should according to the needs of its own open innovation and corporate resources and knowledge of complementarity and the size of the opportunity to learn as a standard to choose the appropriate alliance partner.

### 4.2 Companies Should Collaborative Development with Open Innovation.

Innovation is the key to core competitiveness of the enterprise sustainable, continuous innovation requires the effective access to and use of knowledge, so the open innovation environment, enterprises should maintain a high level of learning, knowledge is necessary resources innovation process, innovation often involves multi-disciplinary comprehensive application of knowledge, the combination of new knowledge and original knowledge is the basis of innovation, open innovation requires the effective access to and use of enterprise internal and external knowledge, this needs through the union needed to obtain various resource and knowledge, so the enterprise strategic alliance and must be open innovation synergy development, Only in this way can enterprises achieve stable and sustainable innovation and development.

### 4.3 Enterprises Should Strengthen Management.

In innovation practice, it is impossible for an enterprise to have sufficient time and energy to keep close contact with various types of external organizations. And the biggest danger of over-openness is technological disclosure [4]. Open innovation in the league, should seek to open innovation in research and development at the same time, also to synchronous realization of open innovation in management, or innovation enterprises will be at risk, because the alliance with other institutions to implement open innovation, increase the enterprise innovation of the complexity of the internal and external environment, also brought, such as market, policy, technology, financial, human, intellectual property rights of different level, such as the difficulty of risk management and work and so on, the effective management of enterprises will be a key to realize the strategic alliance and open innovation.

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