

# The Impact of the Competitiveness of Intermediate Software on Enterprise Results : a Case Study of Chinese Intermediate Software

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### ● 요약 ●

The purpose of this paper is to draw a conclusion on the impact of intermediate software on enterprise results. In this paper, product innovation and product reliability are especially used as analytical factors. An exploratory analytical study is conducted on the competitiveness of intermediate software, in the hope of gaining a new understanding of the competitiveness of intermediate software. Data are analyzed using such quantitative analytical tools as SPSS and AMOS. Using reliability analysis, validity analysis and structural equation model analysis, the final results are achieved. According to the analysis results, we can draw the following conclusions: the competitiveness of intermediate software has a positive impact on the innovation of software products. The competitiveness of intermediate software doesn't have a positive impact on the reliability of software products. Product innovation has a positive impact on enterprise results. Product reliability also has a positive impact on enterprise results. By analyzing the conclusions, we can make certain suggestions and draw implications on the competitiveness of China's software industry.

**키워드:** competitiveness of intermediate product, corporate performance, product innovation, product reliability

### 1. Introduction

There are many papers on the impact of competitiveness on enterprise results. However, there are very few exploring from the perspective of the competitiveness of intermediate products. Studies related to intermediate software, in particular, are even rarer. Papers taking software industry as the object of study mostly consider from the perspective of business transaction. For this reason, the present study attempts to carry out an exploratory study from the impact of the competitiveness of intermediate software on enterprise results.

The theoretical basis for the competitiveness of intermediate

software appearing in this study is integral and modular in Nobeoka Kentaro's MOT Technology Management Getting Started [1], "the force and influence of components, materials and equipment made in China" (2012) by Samsung Economic Research Institute in CEO Information and the product structure theory based on Solutions to Improve the Competitiveness of South Korean Electronics and Automobile Industry from the Perspective of Product Structure by Noh Hyung Jin (2012). On such a theoretical basis, an exploratory study was carried out.

To achieve the expected research goal, we set up a research model from the perspective of the competitiveness of intermediate software. The research model was composed of competitiveness of intermediate product, product innovation, product reliability and enterprise results.

In the selection of industry of interest, we chose China's software enterprises. As China's software industry has developed rapidly since reform and opening up, it produces a profound influence in East Asia and even the whole world. The share of China's software industry in the global market keeps increasing. But it is a pity that profits of China's software industry are on the wane. The biggest reason is that while our exports of finished goods are increasing, our imports of intermediate goods in the high-end market are also increasing. For this reason, we particularly selected software industry to conduct an empirical analysis.

The study of Porter, M.E. [2] showed that the lack of competitive advantage would lead to the lack of corporate competitiveness, as well as the benefits brought about by asset creation. Among them, the most important benefit was improved performance. Once a competitive advantage was achieved, it was necessary to maintain and update market conditions. The method to create sustainable competitive advantage represents an answer given by many companies to strive for survival in a fiercely competitive environment. To realize the method to achieve competitive advantage, there are also many dangers. Every company should be aware of them when it comes to the development of strategies to gain competitive advantages. Rui Zhang[3] suggested that an appropriate thinking mode should be adopted for corresponding design and enhance the effectiveness of innovative product design as a whole. Jadesadalug, Viroj, Ussahawanitchakit, Phapruek[4] believed that a strong tie had a positive impact on the performance of new products, but when we used technological turbulence and intensity of competition as regulators, the interaction would be less significant..

## II. Hypotheses and Research Model

The issue of corporate competitiveness has become a common concern in the current society. The survival and competitive environment of enterprises are facing severe tests. In such an increasingly fiercely competitive market, the competitiveness of enterprises directly or indirectly determines the survival and development of enterprises.[5]. Fierce global market competitions make more and more enterprises pay increasing attention to the shaping and spreading of brand connotation and brand personality. The rapid growth of brand connotation and brand personality has become an important marketing measure for

enterprises to achieve differentiation in market competition [6].

### 1. A research model was built as follows:

Using theoretical research as the basis and integrating findings in other studies, we built the following model shown in Figure 1, with the competitiveness of intermediate product, product innovation, product reliability and enterprise results as the factors.

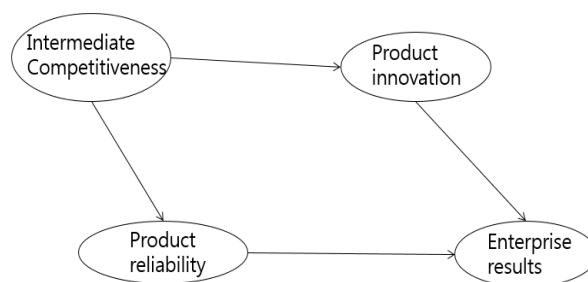


Fig. 1. Model

### 2. Hypotheses

After summarizing the results of previous studies and actual situation, we made the following hypotheses:

- a. The competitiveness of intermediate software has a “+” impact on product innovation;
- b. The competitiveness of intermediate software has a “+” impact on product reliability;
- c. Product innovation has a “+” impact on enterprise results;
- d. Product reliability has a “+” impact on enterprise results.

## III. Research Methods and Results

### 1. Research methods

The present study adopted a common method in social scientific research, questionnaire survey, and used employees in a Chinese software enterprise as the object of study. The duration of survey was from March 10, 2018 to May 4, 2018. After a preliminary survey, the errors in the preliminary survey were corrected and a formal survey was carried out. A total of 300 questionnaires were issued and 253 were recovered. After excluding false questionnaire and other defective questionnaires, a total of 250 valid questionnaires were obtained. Finally, the 250 valid questionnaires were used for analysis, and reliability analysis, factor analysis and structural equation model analysis were conducted using SPSS 22.0.

### 2. Reliability test and appropriateness test

To test the consistency between each variable in the group, reliability analysis was used. Generally speaking, people adopted Nunall (1978)'s Cronbach's  $\alpha$  criterion. The benchmark was set to 0.65, above which the value was considered a valid value for reliability. Through the results of reliability test, we can judge that there existed internal consistency between each item measured. According to the measured results, all of the measured reliability structure was above 0.65 and completely fell within our measurement range of reliability.

Through a factor analysis, we can see that all the weights of the concept and attribute of each variable exceeded 0.6. According to the general experience on appropriateness judgment, as long as the weight exceeded 0.4, the model can be usable. The appropriateness of the model completely fell within the range of appropriateness.

### 3. Research results

Generally speaking, the fit of the overall model can be determined by several indicators, such as chi-square degrees of freedom, RMSEA, GFI and AGFI. Through our test, we can calculate that the chi-square value=87.319, the chi-square degree of freedom= 50, RMSEA=0.055, GFI=0.943 and AGFI=0.912. According to the indicator criteria, it was safe to say that this result can pass the criterion of model fit.

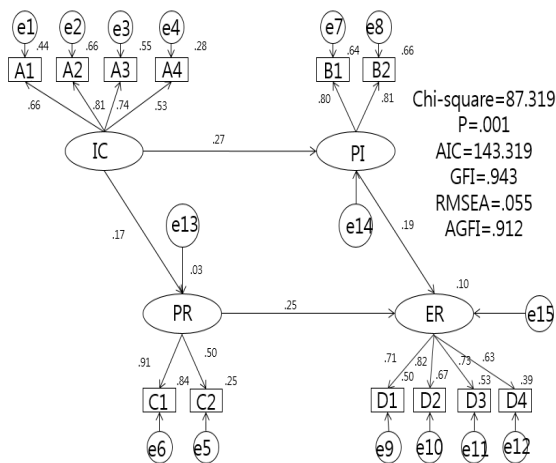


Fig. 2. Structural Equation Model Analysis

According to the test results of hypotheses based on structural equation, we can obtain the following results:

Table 1. Test Results of Hypotheses

Hypothesis	Estimate	S.E.	C.R.	P	Conclusion
Hypothesis 1	0.308	0.099	3.115	0.002	Supported
Hypothesis 2	0.134	0.081	1.661	0.097	Not supported
Hypothesis 3	0.183	0.078	2.351	0.019	Supported
Hypothesis 4	0.341	0.113	3.026	0.002	Supported

- a. The hypothesis that the competitiveness of intermediate products has a “+” impact on product innovation is a meaningful hypothesis;
- b. The hypothesis that the competitiveness of intermediate products has a “+” impact on product reliability is a meaningless hypothesis;
- c. The hypothesis that product innovation has a “+” impact on enterprise results is a meaningful hypothesis;
- d. The hypothesis that product reliability has a “+” impact on enterprise results is a meaningful hypothesis;

### IV. Conclusions

Through the present study, we find that apart from several software countries in the world, most countries' software industry is not at a high level. Especially the intermediate software industry should improve its competitiveness, enhance software innovation and software reliability and contribute to the development of software enterprises. Through hypotheses and model building, after investigation and analysis, we can draw the following conclusions:

1. When intermediate software has certain competitiveness, it is of significant help and have certain influence on product innovation. But if intermediate software has certain competitiveness, it doesn't have a positive impact on product reliability. This suggests that when Chinese intermediate software has certain competitiveness, it is of certain help to product innovation, but still we have a long way to go in terms of the reliability of software enterprises and credibility of products.
2. Product innovation has a significant impact on enterprise results. Product reliability has a significant impact on enterprise results. That is to say, if products make some achievements in innovation, they will have a great influence and be of great help to enterprise results. This suggests that today when the Chinese society develops rapidly and seeks transition, the consumers' pursuit for new things and corporate development attach greater importance to product innovation and reliability.

The above are conclusions drawn from data analysis and have great reference significance for research on other fields of enterprises. However, the present study is confined to China's intermediate software industry. In future studies, we will add other industries and regions and carry out an in-depth study.

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