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# Development of the Organizational Resources towards Innovation Strategy and Innovation Value: Empirical Study

Pai-Chin HUANG<sup>1</sup>, Chia-ling YAO<sup>2</sup>, Scott CHEN<sup>3</sup>

## Abstract

In face of currently economic globalization and rapid development of knowledge, the competition in high-tech industry has developed from regionally to globally. The fierce competition has the technology and knowledge of high-tech industry no longer the exclusive advantages. A high-tech business has to constantly innovate and establish unique resources and pursue better business performance in the business activity to remain the competitive advantages. When drafting and executing innovation strategy, a high-tech business should first measure the internal/external environment and business objectives and consider the organizational resources to propose proper coping strategy. Aiming at employees of high-tech industry in Fujian Province, 380 copies of questionnaire are randomly distributed, and 241 valid copies are retrieved, with the retrieval rate 63%. The retrieved questionnaire data are analyzed with statistics software. The results show notably positive correlations between 1.organizational resources and innovation strategy, 2.innovation strategy and innovation value, and 3.organizational resources and innovation value. According to the results, the proposed suggestions are expected to provide reference for high-tech businesses adjusting the organizational resources to match the innovation strategy so as to assist in the business management.

*Keywords:* high-tech industry, organizational resource, innovation strategy, innovation value.

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## **Introduction**

Enterprises in the 21<sup>st</sup> century are facing the economic globalization and rapid development of knowledge. Besides, the network technology accelerates the information delivery and facilitates the information acquisition. Past spatial and geographical obstacles are eliminated that the competition among high-tech businesses has developed from regionally to globally and become fierce. Especially, when information could be rapidly accessed, the technology and knowledge of a high-tech business would no longer be the exclusive advantage. Lots of research pointed out innovation as the key to maintain competitive advantages of an enterprise. Innovation contained business model, products, service, processes, and channels. A high-tech business had to constantly innovate and establish unique resources to pursue better business performance in the business activity in order to keep the competitive advantages. In addition to the effects of the core resources and external environment, the growth and development also required competitive advantages. In face of the rapidly changing environment, an organization had to apply innovation strategy to enhance the innovation or added value so as to reinforce the competitive advantages.

A successful new product, in the rapidly changing business environment and technology environment, could result in rich profits for an enterprise as well as allow the enterprise keeping the leading advantageous status in the market competition. Nevertheless, in face of low success rate of new product development and uneasy manifestation of innovation value, it is a primary issue for all managers and businesses selecting the correct and suitable development strategy to achieve the new product performance in the competitive industry. Innovation is a method for an enterprise keeping the competitiveness; good innovation requires proper strategy guidance and resource application. Strategy is the aim of business operation and resources are the energy of business operation. An enterprise has to integrate and apply the relevant resources to enhance the strategy execution efficiency and effectiveness. For this reason, an enterprise, when drafting and executing innovation strategy, should measure the internal/external environment and business objectives as well as consider the organizational resources to propose proper coping strategy. Organizational slack resources allow an enterprise being brave to attempt new strategy, e.g. developing new products and entering new markets, as organizational slack resources could buffer internal/external pressure of the enterprise and allow the enterprise coping and adjusting the policies or strategy. It is wondered what types of innovation strategy could have an enterprise achieve the pursued objectives and how the strategy drafting and executing processes are affected by the resources of the enterprise. Based on innovation strategy, this study intends to discuss the correlation between organizational resources and innovation value in high-tech industry, expecting to provide some reference for high-tech businesses making adjustment on organizational resources and matching with innovation strategy to assist in business management.

## Literature review

### *Organizational resources*

From the aspect of the strategic thinking of an enterprise, Tan & Xu (2015) pointed out the change of organizational “resources” to replace traditional “products” would gradually transfer the basis of strategy making from external “industrial competition analysis” to “resource-based view” intrinsic capability. Ranjan & Read (2016) described resource-based strategic logic as the combination of the application of core competence and current businesses to be the motive of new business development. The strategic thinking structure of an enterprise was re-designed based on core competence. An enterprise should carefully develop the core competence; and, the application and sharing of core competence would enhance the value. Al-Ababneh (2015) discussed the extended model of resources from the transaction of organizational resources and industry specificity to acquire important assets through endowment, acquisition, asset sharing, and asset accumulation; different resource extension would be applied to various resources characteristics. Brautzsch *et al.* (2015) classified organizational resources into asset and capability. Asset referred to the stock of elements possessed or controlled by an enterprise, which could be further divided into “tangible asset” and “intangible asset”.

Referring to Yang (2017), organizational resources are classified into asset and capability in this study.

- (1) *Organizational assets*: Asset refers to elements possessed or controlled by an organization, including tangible assets (land of organization, machinery equipment building construction, organization owned funds, and external funds) and intangible assets (brand/goodwill, intellectual property, service quality, contract, marketing channel, and business confidentiality).
- (2) *Organizational capability*: Capability refers to organizational capability to construct and allocate resources, containing individual capability (innovation capability, professional technical capability, leadership styles, management capability, and personal social network) and organizational capability (business styles, organizational technology innovation and commercialization capability, organizational culture, and organizational memory and learning capability).

### *Innovation strategy*

Yang (2015) regarded strategy innovation as the definition of an enterprise re-conceptualizing the business to compete by breaking industrial gaming rules and thinking new methods, i.e. changing industrial competition principles. Strategy innovation, different from the strategy change of an enterprise, stressed on viewing

strategy from industry level; it was a different competition from current industry competition. Arshad & Su (2015) indicated that, when making innovation strategy, the industry condition, company capability, and basic competition strategy should be taken into account. Since technology change would affect industrial structure and competitive advantages, innovation strategy became the essential element in the overall competition strategy of an enterprise. Skalen *et al.* (2015) stated that strategy innovation created new value for customer competitors and created new wealth for all shareholders to re-think the capability of current business model. In the discontinued era, strategy innovation was the key to create wealth. Reijssen *et al.* (2015) regarded strategy innovation as changing industrial dynamic to re-build gaming rules with the new development of external environment. Kim & Fesenmaier (2015) indicated that strategy innovation was to make plans with long-term perspective, treat strategy innovation process from diverse points of view, break through the border of current business models, and think of innovation opportunities.

Referring to Chen *et al.* (2015), innovation strategy in this study contains the following three dimensions.

- (1) *Product innovation*: All innovated products or service of a company, product innovation, modification or update of existing products, extension of existing product line, promotion of new product line, new products with uniqueness, new products with high compatibility with customers' use experience and consumption types.
- (2) *Management innovation*: Adoption of proper strategy at any time to cope with external environment changes.
- (4) *Technology innovation*: A company invests higher proportion of total revenue in R&D expenses than other businesses in the same trade, actively applies for trademark, copyright, and patent, and often introduces new technology to improve products or process.

### *Innovation value*

Yong, Lee, & Song (2015) mentioned that value was defined by customers, who did not purchase products, but the content with specific needs, which would change with different people, time, and space. Value presented various types and different sources; practicability, quality, image, convenience, and after-sales service of products could create customers value. Bates & Khasawneh (2015) pointed out the product consumption value in the knowledge based economic era as functional value (needs contented), emotional value (e.g. perception and loyalty of trademark), and learning value (experience and knowledge accumulation opportunities). Ritala *et al.* (2015) regarded "learning value" as experience and knowledge accumulation opportunities, which could be divided into customer creation and firm creation. "Emotional value" referred to aesthetic perception, unique style, and impression of subject. Durst *et al.* (2015) mentioned that emotional and functional value would

naturally generate with learning value. Kline (2015) regarded innovation as the creativity process to plan and implement a new technology system; the final goal of innovation was being accepted by customers and solving customers' problems that it was necessary to offer innovative functions to satisfy customer needs. A successful enterprise did not simply stress on added value, but the more important strategic task was to re-define the innovation value of process.

Referring to Wong, Liu, & Tjosvold (2015), innovation is value oriented, aiming to enhance the value with "differentiation", "creativity", and "complementarity".

(1) Differentiation: In terms of goods, it is divided into tangible products and intangible products; and, differentiation innovation contains three tactics of physical, mechanical, and chemical.

(2) Creativity: "Creation" is coming out from nothing, creativity, and a new invention. Complementarity stands for the existence of objects to dig out and discuss the characteristics and to understand the characteristics being required by customers or how to make them be required by customers so that users could benefit from them and present transaction value to generate use value. It is regarded as "create value".

(3) Complementarity: To find out usage of products and reinforce the product usage with transaction value, i.e. deeply digging out or increasing product characteristics to enhance the merits and user benefits.

### *Research hypothesis*

Yang (2015) mentioned that organizational resources should present the characteristics of uniqueness, specificity, and fuzziness. Frow, McColl-Kennedy, & Payne (2016) referred uniqueness as core resources, when an enterprise executing innovation strategy, showing the value to enhance efficiency and effectiveness, with rare market supply and without substitutes. Yang (2017) pointed out specificity as the close combination of resources with firm equipment, personnel, organizational culture or management system, which were not being easily transferred or segmented so that other enterprise, even though acquiring the resources, could not develop the function. Lopez *et al.* (2016) referred fuzziness to the causal relationship between the construction process of organizational resources and the competitive advantages not being easily clarified so that competitors could not learn. Chen *et al.* (2015) regarded complexity as resources being the combined capability with mutual dependency among skills, assets, personal experience, and organizational convention; such a combination was too complicated to be imitated by competitors. Tangaraja *et al.* (2016) stated that a company with value or replaceable organizational resources would enhance higher innovation of the development of innovation strategy. Accordingly, a company should actively cultivate valuable and irreplaceable organizational resources to develop R&D projects with higher innovation and further result in excellent innovation

performance of the company. In this case, the following hypothesis is proposed in this study.

*H1: Organizational resources present significantly positive correlations with innovation strategy.*

Yong, Lee, & Song (2015) indicated that an enterprise presented the legitimacy of existence due to the creation of value, which was the core of strategic thinking. Especially in innovation cases, the creation of value was the primary task; innovative value was the source of innovation strategy. Halim *et al.* (2015) considered that applying capital and annual turnover to stand for the size of an enterprise revealing the significant difference of capital cluster in innovation strategy and innovation value of product upgrade frequency and intellectual property right. The higher capital of an enterprise revealed the more positive product upgrade frequency and intellectual property right as well as better innovation value. Marcos-Cuevas *et al.* (2016) indicated that lots of domestic industrial policies started from hardware or manufacturing which might not be practicable to service industry. A government should trip the thinking model of protecting local industries and positively open to and introduce foreign capitals for developing knowledge-intensive industries. Tran & Pham (2016) regarded the positive meaning of promoting technology innovation policies as to facilitate the tight innovation value network with other industries. Accordingly, the following hypothesis is proposed in this study.

*H2: Innovation strategy shows remarkably positive correlations with innovation value.*

In regard to product innovation value, Peter (2000) mentioned that, with the accumulation of organizational resources through R&D capability, an enterprise could satisfy product life cycle and market demands through new product performance, increase in product attribute, and new product R&D. Holgersson & Granstrand (2017) stated that an enterprise, by cultivating the capability of marketing service through organizational resources, could integrate tangible and intangible marketing service and channel systems and effectively promote new products to target customers. Yoon *et al.* (2015) indicated that an enterprise, by developing the mass production capability through organizational resources, could reduce production costs, enhance operation process efficiency, and promote product supply capability to product new products with innovation value. Mario & Henar (2016) argued that high industry concentration would enhance the innovation of a company applying the unique resources to precede R&D projects. Peter (2000) explained that higher market growth rate would affect the driving force of a company applying the resources to innovation activity that managers, when making innovation strategy, should inspect the changes in the industrial environment in order to make the decision to achieve the innovation value. The following hypothesis is therefore proposed in this study.

*H3: Organizational resources reveal notably positive correlations with innovation value.*

## **Research method**

### *Method model*

The goodness-of-fit test with LISREL model could be measured with overall model fit (i.e. external quality of the model) and internal quality of the model. In terms of overall model fit test, the commonly used goodness-of-fit indices contain (1) “ $\chi^2$  ratio” (Chi-Square ratio), standing for the difference between actual theoretical model and expected value, which is better smaller than 3, (2) goodness of fit index (GFI) and adjusted goodness of fit index (AGFI), which reveal the better fit when closer to 1, (3) root mean square residual (RMR) to reflect “fit residual variance/covariance mean”, which is better smaller than 0.05, and (4) incremental fit index (IFI), showing good model fit when higher than 0.9.

Indices for internal quality of model often applied to LISREL include (1) SMC (square multiple correlation) of individual manifest variable, as  $R^2$  of manifest variables and latent variables, which is better higher than 0.5, (2) component reliability ( $\rho$ ) of latent variables, as the Cronbach’s  $\alpha$  of the observation index of latent variables, which is better higher than 0.6, and (3) average variance extracted of latent variables, which is calculated by summing up  $R^2$  of manifest variables in a latent variable divided by the number of manifest variables, revealing that the percentage of a latent variable being measured by manifest variables, which is better higher than 0.5.

### *Research sample and object*

By randomly sampling employees of high-tech industry in Fujian Province, total 380 copies of questionnaire are distributed, and 241 copies are retrieved, with the retrieval rate 63%. The retrieved questionnaire data are analyzed with statistics software.

### *Reliability and validity test*

Validity refers to a measuring scale being able to actually measure the degree of what a researcher intend to measure. General validity contains “content validity” for testing qualitative concepts, “criterion of validity” for the evaluation with preset external criteria and the correlation coefficient in this test, and “construct validity” for evaluating the theoretical consistency of a measurement to other observable variables. The questionnaire content in this study is based on past theories and referred to the actual situations of the research object to truly express



the essence and complete representativeness, in order to ensure the content validity. Furthermore, the ultimate common estimate of factor analysis results is applied to test the construct validity among various items, and the acquired validity appears in 0.7~0.9, showing good validity of the questionnaire in this study.

## Results

### Model fit test

With the estimate of “maximum likelihood method”, the analysis result achieves convergence. Overall speaking, the overall model fit indices in this study pass the test, *Table 1*, fully reflecting good external quality of the model.

*Table 1: Model analysis result*

overall fit	evaluation index	judgment standard	result
	<i>p</i> -value	<i>p</i> -value > 0.05	0.000
	$\chi^2/d.f.$	< 3	1.377
	GFI	> 0.9	0.981
	AGFI	> 0.9	0.916
	CFI	> 0.9	0.974
	RMR	< 0.05, < 0.025 excellent	0.021
	RMSEA	0.05~0.08 good < 0.05 excellent	0.037
	NFI	> 0.9	0.946
	IFI	> 0.9	0.935

### Path relationship test

In regard to the test of internal model quality, the square multiple correlation (SMC) of manifest variables is higher than 0.5 (*Tables 2 & 3*), revealing good measuring indices of latent variables. Furthermore, latent variables of organizational resources, innovation strategy, and innovation value show the component reliability higher than 0.6 and the average variance extracted of dimensions is higher than 0.5 (*Table 4*), apparently conforming to the requirement for internal model quality.

*Table 2: SMC of variable to dimension*

organizational resources	
organizational assets	organizational capability
0.78	0.81

Table 3: SMC of variable to dimension

innovation strategy			innovation value		
product innovation	management innovation	technology innovation	differentiation	creativity	complementarity
0.75	0.80	0.84	0.73	0.76	0.83

Table 4: Component reliability of variable and average variance extracted

item	organizational resources	innovation strategy	innovation value
component reliability	0.821	0.855	0.847
average variance extracted	0.80	0.84	0.83

From *Table 5*, organizational resources present positive and significant correlations with innovation strategy (0.872), innovation strategy shows positive and remarkable correlations with innovation value (0.832), and organizational resources reveal positive and notable correlations with innovation value (0.851) that H1, H2, and H3 are supported. The hypothesis test of this study is shown in *Table 6*.

Table 5: Linear structural model analysis result

evaluation item	parameter/evaluation standard	result	t
internal fit	organizational resources → innovation strategy	0.872	33.16**
	innovation strategy → innovation value	0.832	26.75**
	organizational resources → innovation value	0.851	29.44**

Table 6: Hypothesis test

research hypothesis	correlation	empirical result	P	result
H1	+	0.872	0.00	supported
H2	+	0.832	0.00	supported
H3	+	0.851	0.00	supported

## Conclusion

From the research results, a high-tech business manager would be positively and significantly affected the promotion of innovation value by organizational resources and innovation strategy. In this case, a manager, when preceding innovation, should consider the resources & environment and competitive advantages of the organization to make analyses and plans. Moreover, various resources and competitive advantages should also be reinforced when promoting innovation strategy and innovation value. In this case, a high-tech business should really understand the organizational resources and competitive advantages. A high-tech manager, under specific coverage and limited resources, should present innovation behavior by recruiting quality new employees and reinforce employee education and training to enhance employees' quality and competence. Moreover, the sense of work mission and innovation spirit & attitude should not be ignored.

### *Suggestions*

From the important results and findings, practical suggestions, aiming at the research results, are proposed.

(1) To enhance the competitiveness, a high-tech business should think of the innovation direction and value, according to the characteristics, resources, and conditions, make innovation strategy, and combine knowledge management and innovation strategy to control knowledge management activities and create innovation business for finding out the survival way for sustainable management.

(2) Single organizational resource could not face the environment with changing demands. In addition to reinforcing efficiency, quality, innovation, and customer response, high-tech businesses, with distinct characters, should analyze the competitive advantages to assist in the success of management strategy and apply organizational resources to strive for stronger competitive status than other competitors.

(3) Value is defined by customers. A customer does not purchase products, but is contented with specific needs. Along with changes in people, time, and space, value presents various types and sources. Product practicability, quality, image, convenience, and after-sales service could create customer value. After grasping the competitive advantages and customer needs, a high-tech business could establish new methods or products, marketing, businesses, and value, different from traditional ones, to make new gaming rules among organizations, face the challenge of transformation, break through dilemmas, and continuously reform the innovation spirit and value.

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