

# Theoretical Overview of Method Research on Informatization Promoting Enterprise Competitiveness

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## **Abstract**

*The existing and competitive environment of enterprises faces severe challenges in the process of global economic integration, and how the enterprises win the competitive advantages in the market to achieve sustainable development has become the focus of attention. With the rapid development of internet, information construction and application have gradually become important means to win the competitive advantages for enterprises. This thesis summarizes the method research status of enterprise informatization promoting competitiveness conducted by domestic and foreign scholars through analysis from the perspective of driving force (namely, external environment, internal resource & capabilities and internal & external integration) of enterprise competitiveness, which is useful to the construction of enterprise informatization and the promotion of the competitive advantages and provides theoretical basis and policy suggestions for further study of enterprises informatization construction and competitive advantage.*

**Keywords:** *Enterprise Informatization, Competitiveness, Resources, Competitive Advantages, Capabilities*

## **1. Introduction**

As the information technological revolution goes deeper, enterprises based on informatization have seen a surge of revolution: Tianhong Fund achieved the geometric growth of amounts of assets management within half a year by virtue of e-channel of Alibaba, becoming the largest publicly offered funds in China and making a great achievement which is hard for traditional fund to strive for over decades; Tencent has acquired over 0.3 billion mobile terminal users over the last two years by virtue of WeChat, becoming the genuine asset-light operator, while traditional operators have been competing for customers with expensive agent commission and mobile terminal subsidy. Informatization is changing the competition pattern in each industry profoundly, but through what internal methods the informatization promotes the enterprise competitiveness? This thesis shall summarize the mainstream research domestic and foreign achievement and status to offer informatization suggestions for managers and point out the future significant research direction.

## **2. Foreign Theoretical Research Overview**

Foreign academic circles have carried on research on the “relationship between informatization and enterprise competitiveness” and “the internal mechanism of informatization promoting enterprise competitiveness” for a very long time. Foreign scholars have had different views about the relationship between informatization and enterprise competitiveness for a long time. Some of them believe that informatization investment is

positively associated with market performance of enterprises, and the performance of enterprises with high informatization capability is higher than that of the enterprises with normal informatization capability (Brynjolfsson and Hitt, 1996; Bharadwaj, 1999); while other scholars find that the two are uncorrelated, even negatively associated with each other through research (Warner 1987; Barua, 1995). For example, some enterprises fell in the “rigid trap” after promoting informatization, namely, process unification arising from informatization limits the flexibility and reaction capability of business activities (Theodors Evgeniou, 2002). As time goes by, informatization plays an increasingly important role in world economic development. The vigorous development of e-commerce, internet finance, virtual manufacturing and other emerging economies gives birth to many business magnates. It’s indisputable that informatization is the key factor to promote enterprise competitiveness.

As informatization cannot stand alone, Ravichandran holds that informatization shall indirectly promote the enterprise competitiveness by exerting positive influence on enterprise resources based on research; while the premise for enterprise resources promoting its competitiveness is by means of proper competition strategy to play the role, so informatization is necessary for promoting enterprise competitiveness. Fang Wu believes that research on informatization as an element in isolation only focuses on the potential space created by informatization for promotion of enterprise competitiveness other than the influences on real enterprise competitiveness; therefore, as an approach and tool to promote enterprise competitiveness, informatization needs a certain entity or activity to realize the promotion of enterprise competitiveness (such as product innovation, knowledge management). The level of coordination between informatization and enterprise strategy shall affect the promotion of enterprise competitiveness directly;

By what means will the informatization realize the promotion of enterprise competitiveness? Research has been conducted from three points of view by foreign scholars:

### **2.1. School of External Environment Drive Theory**

External environment drive theory discusses the approaches of informatization promoting enterprise competitiveness on the theoretical basis of “Michael Porter’s Five Forces Model”. This theory goes that enterprises are collections of activities adapting to market and gaining advantages in the market (Spanos and Lioukas, 2001), and by these activities the informatization is capable of promoting enterprise competitiveness; specifically, these scholars hold that by supporting “Low-cost Strategy” (such as reduce cost by e-commerce) or “Strategy of Product Differentiation” (such as by electronic conference system supporting R & D of products, reduce the development time of new products and launch more new products), informatization shall help obtain enterprise competitiveness.

Michael E. Porter and Victor E. Millar (1985) believe that informatization exerts influence on business activities through changing the industrial structures, creating new competitive methods or business models, and also put forward the concept of value chain, namely a value system by combining a series of enterprise activities, not only including internal activities of enterprises, but the collaborative activities with suppliers and other partners. Informatization promotes the enterprise competitiveness by improving strengths of each link in value chain; Benjamin and Eliot Levinson (1993) believe that informatization enhances the enterprise competitiveness by means of organizational reform and put forward eight principles required to follow in informatization reform, which is favorable to successful implementation of informatization reform and enhancement of enterprise competitiveness; Ross (1996) came up with three critical informatization assets (a. competitive informatization talents; b. cooperative relationship between informatization management and business management; c. open and advanced sharing platform and database) and three key objectives (a. better

integration between informatization product service and enterprise strategy; b. provide faster solutions; c. provide relevant support services with better cost effectiveness and new products of better quality) and establish the external competitive environment-self-informatization asset state matrix to guide informatization strategy under different circumstances.

## **2.2. School of Internal Structure Drive Theory**

Internal structure drive theory studies the approaches of informatization promoting enterprise competitiveness on the basis of resource competition theory put forward by B. Wernerfelt and Barney from the perspective of enterprises resources. Resource competition theory considers enterprises as collections of resources. Due to different resources available to different enterprises and low mobility of core resources, there are large differences in enterprise resource endowment and enterprises create their own competitive advantages relying on these inimitable and irreplaceable unique resource endowment. While informatization develops the distinctive capability of enterprises or creates unique resources (for example, informationalized knowledge management shall integrate various knowledge and experience to help enterprises to rapidly come up with solutions to problems across time, space and personnel) by mutual adjustment with organization structure, business process, knowledge management, enterprise culture, etc.

Bharadwaj, A.S (1999) holds that informatization investment may not be turned into enterprise competitive advantages, which can promote the enterprise competitiveness only by turning it into the integral informatization capability of enterprises. During informatization investment turns into informatization capability, not only the informationalized soft hardware is necessary to be purchased, but more time and efforts should be put into to seek ways of building integral informatization capability of enterprises (such as, overcome reform difficulties, adjust organization structure and optimize the business process); The informatization capabilities consisting of informationalized soft hardware and supporting resources are divided into six levels by him: informatization business partner, external linkages, strategic thinking, business process integration, management and infrastructure.

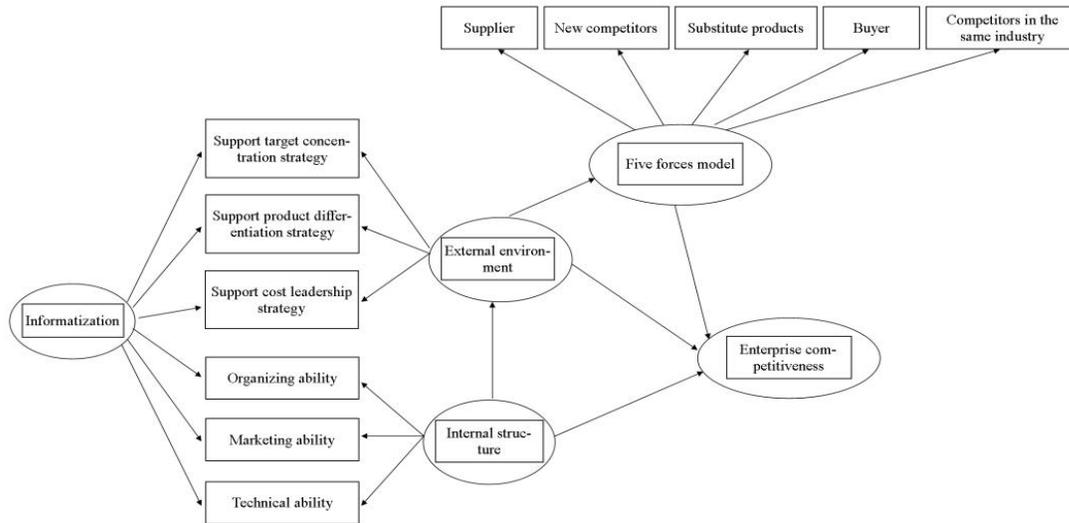
Michael J. Zhang and Augustine A. Lado (1999) believe that informatization improves the enterprise competitiveness indirectly through its positive influence on business organizational capability; informatization exerts influence on investment, transfer and output capabilities of enterprises by promoting a. internal information collection and communication, b. external information collection and communication, c. the capabilities of data converted into information and knowledge and d. the development of internal knowledge and professional resources of enterprises, further enhancing the enterprise competitiveness.

## **2.3. School of Internal & External Integration Drive Theory**

Internal & external integration theory studies the approaches of informatization promoting enterprise competitiveness based on the “Michael Porter’s Five Forces Model” and “Resource Theory”, which is essentially the combination of external environment drive theory and internal structure drive theory. Suzanne Rivarda believes that in spite of different theoretical prerequisites of the above theories, they are obviously complementary when conducting external market-driven and internal resource-driven research.

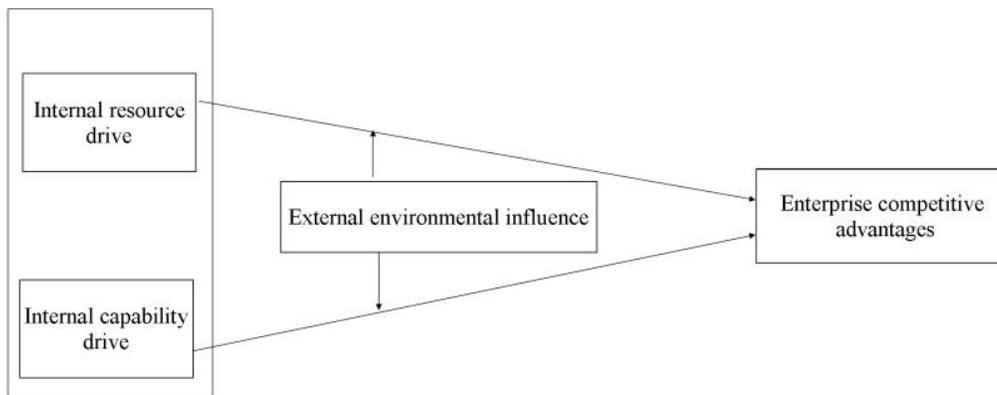
Suzanne Rivarda and Louis Raymond (2006) show the supporting role of informatization for three competition strategies from the perspective of external environment and for business organization competitiveness, marketing competitiveness and technological competitiveness from the perspective of resources. Empirical research finds that the supporting role of informatization for enterprise resource and strategy is of high correlation,

and the internal environment drive theory and external environment drive theory could be complementary rather than competitive, which might need deeper reasoning (see Figure 1). Furthermore, their empirical research also finds that: 1. the supporting role of informatization enterprise competition strategy and internal resources explains the fluctuation of 29% enterprise performance and the positive correlation relationship between informatization and enterprise competitiveness; 2. the empirical research verifies the conclusion of enterprise informatization targets made by Tallon: a. enhance the external competitiveness of enterprises and hold their places in competitive market; b. lift the efficiency of enterprise internal management.



**Figure 1. Suzanne Rivarda, Diagram of Informatization Function Based on Michael Porter's Five Forces Model and Resource Theory**

M. Dale Stoel and Waleed A. Muhanna (2008) build the integral contingent model and believe that the informatization capabilities of intrinsic and extrinsic goals play a positive role in promoting enterprise competitiveness, which is obviously affected by external environmental conditions though (see Figure 2).



**Figure 2. M. Dale Stoel, Integral Contingent Model Figure of Informatization)**

Other than the aforesaid theoretical research methods, some scholars carry out research based on cases. Though this method is lack of sufficient theoretical evidence, it still exerts great influences because of its closeness to actual operation. MA Xiaofeng and Liu Lu (2008) conduct trace and contrastive analysis on cases of enterprise informatization in different countries, find that informatization investment shall not play the obvious supporting role for enterprises without specific informatization strategy or with informatization strategy not conforming to enterprise strategy, and summarize the steps for information construction: a. select corresponding informatization strategy (defensive strategy-efficient informatization strategy, analytical strategy-comprehensive informatization strategy, exploratory strategy-flexible informatization strategy) in accordance with the type of enterprise strategy; b. analyze various organizational activities of enterprises; c. establish the supporting business process related to information system (such as knowledge management mechanism and customer relation management mechanism).

To sum up, the writer categorizes and sorts out the typical foreign research achievements, as shown in table below:

Classification of research theory	Research conducted by foreign scholars	Overview of research achievements
External environment drive	1. Benjamin and Eliot Levinson (1993)	Informatization promotes the enterprise competitiveness through organizational reform; eight principles required to follow in informatization reform are put forward, which is favorable to the successful implementation of informatization reform and promotion of enterprise competitiveness. Informatization exerts influence on business activities by changing industrial structures and creating new competitive methods or business models; the concept of value chain is come up with.
	1. Michael E. Porter Victor E. Millar (1985)	
Internal resource drive	2. Ross (1996)	Put forward three critical informatization assets and three key objectives of informatization management and build the external competitive environment-self-informatization asset state matrix to guide informatization strategy under different circumstances.
	1. Michael J. Zhang and Augustine A. Lado (1999)	Informatization promotes the enterprise competitiveness indirectly through its positive influence on business organizational capability.
Internal & External Integration Drive	2. Bharadwaj, A.S (1999)	The empirical research by contrast in groups finds that enterprise with higher informatization degree tends to have higher competitiveness; invest more resources to improve the overall informatization level and enterprise competitive level.
	1. Suzanne Rivarda and Louis Raymond (2006)	Show the supporting role of infromatization in three competition strategies from the perspective of external environment and in business organizational competitiveness, marketing competitiveness and technological competitiveness from the perspective of resources.

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	2. M. Dale Stoel, Waleed A. Muhanna  (2008)	Believe that the informatization capability of intrinsic and extrinsic goals plays a positive role in promoting enterprise competitiveness, which is obviously affected by external environmental conditions though.
Method of Case Contrast	1. MA Xiaofeng, Liu Lu (2008)	Informatization investment shall not play the obvious supporting role for enterprises without specific informatization strategy or with informatization strategy not conforming to enterprise strategy.

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### 3. Overview of Domestic Theoretical Research

Relevant research was carried out in middle and later 1990s in China focusing on the research on influencing mechanism of informatization promoting enterprise competitiveness by referring to the foreign theoretical research and adopting the methods of recognition of problem-analysis of problem-solving of problem. According to the research on influence of information technology on enterprise competitive advantages, analyze the deficiency and defects of informatization driving enterprise competitiveness in Chinese enterprises and discuss how to promote the enterprise competitive advantages by informatization.

From the same perspective as foreign research, correlational research in China is also divided into three levels: 1. In the level of external resource drive, enterprises can obtain and apply the external information better through the application of informatization in external dynamic market environment of enterprises and make and adjust the strategic decision made within a short time by referring to its own situations, so as to achieve better positioning of product and service in market, improve the flexibility of enterprises in competitive fields and promote the enterprise competitive advantages; 2. In the level of internal resource capability drive, with enterprise resource and capability as the starting point, study the relationship between informatization and competitiveness, organically integrate the informatization and R & D of products, business process and management strategy of enterprises, achieve the integrated management mode of “Three Currents Combination” of enterprises by integrated application of information resources and capability in internal structure, enhance the enterprise innovation ability, speed up the adjustment of internal structure of enterprises, promote the enterprise competitiveness and sustainable rapid development through informatization construction; 3. In the level of internal & external integration drive, change the value chain and competitive capability of enterprises by applying informatization construction and combining external market environment and internal structure. The author selects representative domestic research results, details being as follows:

#### 3.1. School of External Environment Drive Theory

Tian Jie (2000) respectively specifies the way of establishing competitive advantages for enterprises with the support of information technology through the cost leadership strategy, product differentiation strategy and target concentration strategy put forward by Porter, from the perspectives of differentiation production and service of information system, market segmentation and data warehouse technology, supply chain management and rapid customer response system as well as the relationship among competition strategies in enterprises; Fu Sha (2008) reckons that the competitive advantages of enterprises can be enhanced by responding to external market demand, accelerating enterprise structural adjustment, pushing forward enterprise innovation and perfecting after-sales services through stipulation and modification of enterprise strategies, reorganization of enterprise business process and

promotion of organizational structure optimization with information technology resources; Yu Weiping, Hu Wanhua and Liu Yun (2002) put forward the enterprise competitive advantage model centered on information, and discussed and analyzed the influence of information economy and game theory on enterprise competitiveness from the perspectives of enterprises and customers, suppliers, markets and competitors based on the application of information technology (CRM, SCM, network marketing, virtual enterprise, competition and cooperation, etc.), suggesting that Chinese enterprises should enhance their core competitiveness based on information technology; Cao Shuyan (2004) clarifies the relationship between information system and competitive advantages through analyzing the competitive strategy of Wal-Mart, deeming the establishment and application of perfect information system as significant ways for enterprises to enhance their competitiveness.

### **3.2. School of Internal Structure Drive Theory**

Zhang Shuang and Zhang Yang (2006) advocate the reformation and innovation of enterprises in information technology are conducted from such three levels as management, strategy and operation, thus enhancing the competitive advantages of enterprises by better integration of information technology with enterprise strategy, business processing and organizational structure; Wu Qiaoshun (2005) thinks that the key to enhancing enterprise competitiveness is the deepened integration of information technology with enterprise business mentality and management mode, and such enhancement can only be achieved from the integrated management of material flow, capital flow, personnel flow and information flow in enterprises, which is realized through scientific informatization strategic planning and informatization application of core business; Liu Zhongjing (2005) analyzes the application of enterprise informatization in strategic resources and core competence from the perspective of economics, proposing to transform the resources to enterprise knowledge by focusing on the development and application of information resources, thus further transforming into the driving power of enhancing enterprise competitive advantages; Li Yong (2004) holds that enterprise competitiveness can be enhanced by informatization in seven aspects, namely, relative contraction of enterprise cost, enhancement of informatization competence and promotion of technological innovation of enterprises, optimization of organizational structure and improvement of organization performance, promotion of management innovation and enhancement of overall enterprise management level, development of human resources and enhancement of enterprise quality, promotion of scale management, as well as formation of differentiation economic effect and optimization of enterprise value chain.

### **3.3. School of Internal & External Integration Drive Theory**

Qu Wei (2005) advocates the enhancement of enterprise competitiveness can be achieved by the application of spillover effect and integration effect of information technology; Guo Qingran (2009) analyzes the influences of application of enterprise informatization on the internal cost of enterprises and reaction speed of external market from the perspective of microeconomics, advocating the enhancement of enterprise competitiveness through the deepened integration of information technology with product R&D, production management, business strategy, marketing of enterprise and enterprise culture; Liu Xin (2004) thinks the enhancement of enterprise competitive advantages can be achieved by changing the essence of enterprise competition through the integration and application of internal & external enterprise resources by virtue of informatization; Qin Gang (2004) thinks the enhancement of enterprise competitive advantages can be achieved through the application and innovation at

such levels as strategic logic, core competence, value chain, final products and market segmentation of enterprises by virtue of informatization; Xie Kang (1999) thinks the enhancement of enterprise competitive advantages can be achieved through the formation of differentiation products and services, change in competition mode, expansion of competition field, binary transaction cost as well as product and technological innovation by virtue of informatization; Wu Bin (2002) clarifies, by analyzing the cases on enterprise informatization construction, that the enhancement of enterprise competitiveness can be achieved through the integration of informatization with technological competence, business capability, learning organization, comprehensive management level and external effects of enterprises; Wu Fengyu and Xu Yan (2006) think that the essence of informatization lies in the changes in external environment for enterprises, which will further influencing the operation idea of enterprises; moreover, the enhancement of enterprise competitive advantages can be achieved through the application of information technology in value chain, including adjustment and innovation of business process, collection of data information, and selection of partners and plans for informatization process.

To sum up, the author selects and sorts out by categories the representative domestic research results, as shown in the following table:

Classification of research theory	Researches by Domestic Scholars	Overview of research achievements
External environment drive	1. Tian Jie (2000)	Research the way of establishing competitive advantages for enterprises with the support of information technology through the cost leadership strategy, product differentiation strategy and target concentration strategy put forward by Porter.
	2. Zhu Meiqin (2003)	Sustainable enterprise competitive advantages are enhanced through optimization of business process, innovation of products and services, close contact with suppliers or customers and reasonable reformation of organizational structure by virtue of information technology and in combination of "Michael Porter's Five Forces Model".
	3. Fu Sha (2008)	Enterprise competition strategies are obtained by virtue of information technology, by taking the competition strategy theory of Porter as a guide.
	4. Cao Shuyan (2004)	The effect of information system in competition and influence of the same on enterprise competitive advantages are analyzed in five aspects, centering on the competition structural model of Porter, which will be used to build the framework for competitive advantages in enterprise information system.
	5. Yu Weiping, Hu Wanhua, Liuyun (2002)	Market structure and competitive environment are re-identified and re-analyzed, building of enterprise competitive advantage model centering on information is proposed, and the influences of information economy and game theory on enterprise
Internal Structure Drive	1. Zhang Shuang and Zhang Yang (2006)	Enterprise competitive advantages are enhanced through the reformation at such three levels as management, strategy and operation, according to actual conditions of the enterprises.

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	2. Wu Qiaoshun (2005)	Enterprise competitiveness is enhanced through the deepened integration of information technology with the enterprise operation idea and management mode, realizing the integration of four branches.
	3. Zhang Hui (2008)	It is clarified that the enterprise information resource management mechanism is built through applying information resources in material, financial resources as well as in the enterprises, by analyzing the mechanism for enterprise competitive advantage enhancement with information resources.
	4. Cai Quan (2005)	The relationship between information system resources and performance, and the modulation of competition strategies in such relationship are researched by means of demonstration.
	5. Li Yong (2004)	The way of enhancing enterprise competitiveness through enterprise management informatization is discussed in a comprehensive and deep manner.
	6. Liu Zhongjing (2005)	The application of enterprise informatization in strategic resources and core competence is analyzed from the perspective of economics, by focusing on the development of information resources, in order to transform the resources to enterprise knowledge and further to the driving power of enhancing enterprise competitive advantages.
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Internal & External Integration Drive	1. Liu Xin (2004)	The enhancement of enterprise competitive advantages is achieved through the analysis and research on enterprise value chain and value system, and the research on the informatization strategy for enterprise development by integrating and applying the Internal & external resources of enterprises.
	2. Qu Wei (2005)	The enhancement of enterprise competitive advantages is achieved by the application of spillover effect and integration effect of information technology of enterprises.
	3. Guo Qingran (2009)	The influences of application of enterprise informatization on the internal cost of enterprises and reaction speed of external market are analyzed from the perspective of microeconomics.
	4. Qin Gang (2004)	The enhancement of enterprise competitive advantages is achieved through the application and innovation at such levels as strategic logic, core competence, value chain, final products and market segmentation of enterprises by virtue of information system technology.

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5. Wen Chihong (2011) The deficiency and defects in Chinese enterprise internal informatization construction are analyzed from the perspective of competition, providing theoretical basis and policy suggestions for the enterprise informatization construction, and thus enhancing the competitive advantages of enterprises.
6. Xie Kang, Wu Jiapei and Chen Yu (1999) The concepts of “Relative Contraction of Enterprise Cost” and “Competitive Advantage for Borderless Expansion” are put forward, offering supplement to the theories of Porter and Wiseman.
7. Xie Kang (1999) The enhancement of enterprise competitive advantages is achieved through the formation of differentiation products and services, change in competition mode, expansion of competition field, binary transaction cost as well as product and technological innovation by virtue of information technology.
8. Zhong Weijun and Mei Mei’e (1998) The methods of influences of information system technology on the competitiveness of Chinese enterprises are analyzed at such three levels as the industry of enterprises, the enterprise itself and general competition strategy of enterprises.
9. Wu Bin (2002) It is clarified that the enhancement of enterprise competitiveness is achieved through the integration of informatization with technological competence, business capability, learning organization, comprehensive management level and external effects of enterprises.
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10. Wu Fengyu and Xu Yan (2006) The enhancement of enterprise competitive advantages is achieved through the application of information technology in value chain, including adjustment and innovation of business process, collection of data information, and selection of partners and plans for informatization process.
11. Wang Wanwei (2005) The enhancement of enterprise competitive advantages in market is achieved through the application and innovation in reorganization of enterprise process, improvement of internal management and personnel quality of enterprises, as well as the procurement, distribution, supply, sales and settlement of goods by virtue of informatization construction.
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#### **4. Brief Comment and Researching Direction on Domestic and Foreign Theoretical Studies**

Notwithstanding the different specific opinions of domestic and foreign scholars on the internal mechanism of informatization enhancing enterprise competitiveness, the mainstream opinions are generally as follows: (1) The informatization involves not only the software and hardware for informatization, but also the supporting enterprise system, organizational structure, business process, enterprise culture, etc., therefore, it is not accurate to measure the informatization degree by only the grade of corresponding software and hardware or the

amount of investment therein, that is, more time and effort are needed for successful informatization; (2) The informatization provides the enhancement of enterprise competitiveness through influence of internal & external elements, rather than either one of them. In consideration of the “soft capabilities” involved in the informatization, various methods for measurement of informatization degree are applied by domestic and foreign scholars: some adopt the informatization degree in studies based on the ranking or indexes of informatization published in enterprise newspapers, while others adopt self-established evaluation system, in which the informatization degree is measured by the scores of questionnaires, lacking sufficient verification of accuracy of informatization measurement; in general, lack of authoritative and accurate informatization evaluation system may lead to the foundation instability of researches on the influences of informatization on enterprise competitiveness/performance, and the deviation in informatization degree evaluation will directly affect the accuracy of empirical research results.

For domestic and foreign scholars, it has become the main researching direction on the mechanism of informatization for enhancement of enterprise competitiveness, to integrate internal & external elements, which is due to the stronger explanatory power of such research for actual situations; however, there is still no appropriate consideration as regards the contradiction in the premises of the external drive theory (i.e. “Michael Porter’s Five Forces Model”) and internal drive theory (Resource Theory): according to the former, there’s no difference in resources among enterprises, for such resources feature liquidity; while according to the latter, there are some differences in resources among enterprises, thus causing competitive advantages. Only the above problem is solved appropriately, can the reliability of research results integrating both internal & external elements be ensured on theoretical basis.

Part IV of this thesis specifies two difficulties in the current research, which may influence the further research. (1) As for the informatization degree evaluation, academic circles should make a further discussion about informatization evaluation system based on the research of competitiveness goals in order to reflect the “soft part” of informatization level in a detailed and authentic way; (2) As for the contradiction in internal & external integration drive theories, introduction to other variables or application of other solutions shall be made by the academic circles. The resources of informatization feature liquidity in the long run, which are difficult to be obtained by simply purchasing relevant software in the short run, however; therefore, the current model for internal & external integration drive theories is required further modification, in order to ensure sufficient theoretical basis for empirical research results.

## **5. Suggestions for Managers on Informatization Construction**

According to the research results throughout the academic field, general suggestions on informatization are given to managers, as follows:

1. Stipulate informatization strategies in accordance with the competition strategic features of enterprises, avoiding negative effects of unreasonable informatization strategies to operation and development of enterprises (e.g. enterprises with bigger differences in regional business operation must adopt informatization system of more flexibility and openness);
2. The informatization construction shall be subject to the decision of senior managers for uniform standard, in order to avoid the disorder of informatization system, failure in supporting senior decisions and difficulty in subsequent upgrading of information

system due to separately construction of departmental or regional informatization systems by middle managers;

3. Input in process reorganization, management improvement and reformation of organizational structure besides the information system shall be concerned in informatization construction, in order to promote the integration of informatization with various aspects of enterprise operation, thus giving full play to the informatization in the penetration and promotion of enterprise operation in real sense.

## 6. Conclusion

For over three decades, domestic and foreign scholars have been researching on the ways of informatization for enhancing enterprise competitiveness, putting forward opinions from various perspectives. According to the research results of the whole academic field, the ways are provided rather completely from both internal & external perspectives; however, as regards an independent research result, there exist the following problems: 1. Excessive abstraction (e.g. the enhancement of enterprise competitiveness through integrating informatization with enterprise competition strategies); 2. Looseness and incompleteness (e.g. the enhancement of enterprise competitive advantages is achieved through the formation of differentiation products and services, change in competition mode, expansion of competition field, binary transaction cost as well as product and technological innovation by virtue of informatization); 3. Defects in theoretical basis (e.g. the school of internal & external integration drive theory has not solved the contradiction on premises of resource liquidity between external environment drive theory and internal structure drive theory); 4. The conclusions are always based on sufficient practical induction and summary of comments to managers, rather than reliable verification by empirical results.

Generally speaking, the current direction of the studies integrating internal & external elements is consistent with that under practical circumstances known by the author. A mainstream opinion is that the enhancement of enterprise competitiveness is achieved through influence on both external competition and internal resources by virtue of informatization; however, there are differences as for the specific aspects of such enhancement among the scholars. According to the author, the measurement of informatization degree and the contradiction in the internal & external drive theories will be the primary issues to be solved in future research. Next, systematic analysis and discrimination on the ways of realizing informatization will be required, thus forming complete and systematic diagram by eliminating the aspects of higher correlation and leaving only the principal aspects. Finally, diagrams for realization ways already proposed shall be quantified, to determine the shares of informatization and specific realization ways respectively in enhancing enterprise competitiveness.

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