Research on the Influence of Information Technology on Industrial Competitiveness

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Abstract. Information technology, also known as information and communication technology, is mainly used to manage and process information. Information technology not only improves the operation and management efficiency of enterprises, but also gives birth to a new business model of the industry. Also, it has a profound impact on the competitiveness of national and regional industries. By analyzing the influence of information technology on four determinants and two external forces of Porter's diamond model, this paper reveals the influence of information technology on industrial competitiveness.

Keywords: Information technology; Industrial competitiveness; Diamond model.

1. Introduction

Information technology, also known as information and communication technology, is mainly used to manage and process information. On the one hand, information technology has improved the production and management efficiency of enterprises, on the other hand, it has also spawned a new business model, profoundly changing the competitive structure of the industry. The financial industry is the first industry to apply information technology. In 2005, the author began to study the impact of information technology on the competitive advantage of commercial enterprises. Please refer to my book "Research on the application of information technology and competitive advantage of commercial banks" (Master's thesis of Sichuan University) This paper mainly analyzes how information technology affects the four decisive factors in Professor Porter's Diamond Model: production factors, demand conditions, related industries and supporting industries, enterprise strategy and organizational structure and competitors. At the same time, it also analyzes the impact of information technology on industrial opportunity and government. These analyses explain how information technology changes and affects the competitiveness of industries.

2. Theory of Industrial Competitiveness

Research on industrial competitiveness. David Ricardo, a British classical economist, put forward the theory of comparative advantage. He thinks that a country should concentrate on producing and exporting goods with comparative advantages and import goods with comparative disadvantages. Porter thinks that the factors that affect industrial competitiveness include four determinants and two external forces. The four determinants are production factors, demand conditions, related industries and supporting industries, enterprise strategy and organizational structure and competitors. The two external forces are opportunity and government.
3. Analysis of the Impact of Information Technology on Industrial Competitiveness

3.1. Analysis of the Influence of Information Technology on Four Determinants of Industry

3.1.1. The impact of information technology on industrial production factors. Production factors include natural resources, labor factors, capital elements, knowledge reserves and infrastructure. The influence of information technology on industrial production factors can be realized through the following two aspects.

On the one hand, combining information technology with natural resources and infrastructure of the industry to create a smart industry. Information technology helps the intelligent construction of industrial resources and infrastructure, which can facilitate customers, improve the experience of consumers on products and services, and increase customer stickiness; through information technologies such as GPS positioning and image recognition, this technology is of special significance for the security and tracking of special groups.

On the other hand, the combination of information technology and human resources can improve the value of human resources with low cost and efficiency. The impact of information technology on the competitiveness of human resources is reflected in two aspects: one is to make the supply and demand information of labor market more symmetrical through information technology; the other is that information technology makes training cost lower and training efficiency higher. Information technology promotes the value of industrial human resources rapidly. Information technology also makes it easier to store, transfer and share knowledge.

3.1.2. The impact of information technology on industrial demand conditions. The characteristics of domestic demand play a very important role in shaping the characteristics of domestic products and improving the quality. Mature, complex and demanding consumers will urge domestic enterprises to strive to achieve high quality standards and product innovation. This kind of example is common in other industries. The mature, complex and high-level consumers in Japan have prompted the Japanese camera industry to constantly improve the quality of cameras and launch new camera models. Sichuan people like to eat spicy food with strong flavor. Such consumers often have complex oral diseases, which promotes the continuous development and progress of West China Stomatology Hospital of Sichuan University, and thus has international competitive advantages. In addition to the large number of customers in China, they can also be divided into different groups. Different demands can help enterprises to provide high-quality products and services and constantly realize product and service innovation. The impact of information technology on industrial demand conditions is reflected in three aspects:

Firstly, information technology can help enterprises improve their service level. It is convenient for enterprises to accurately identify and find its customers. Relying on massive big data, enterprises can accurately grasp the demand characteristics of different customer groups, and facilitate enterprises to better meet the needs of various types of customers. Information technology promotes the service level of enterprises.

Secondly, information technology can help customers to find products and services suitable for their own needs more conveniently and quickly. Information technology can help people find the products or services they need quickly and conveniently, and effectively match the products or services between the providers and the products or services. Consumers can always find the most suitable products or services on the market, so as to improve customer satisfaction.

Finally, information technology strengthens the interaction between supply and demand of products, and promotes enterprises to improve products and services. Information technology makes the products and services of enterprises more transparent and open. On the one hand, it is easy for consumers to find the products and services they need; on the other hand, enterprises can get more real experience feedback. This kind of feedback enables enterprises to clearly know the deficiencies of their products and services, and constantly improve their products and services to meet the changing needs of their customers.
3.1.3. Analysis of the impact of information technology on related industries and supporting industries.

Business activities are inseparable from transportation industry and communication industry. Information technology has a great impact on industrial competitiveness by revolutionizing the competitive situation of transportation logistics, network e-commerce activities and other related industries.

For one thing, information technology promotes intelligent transportation and enhances industrial competitiveness. By the end of 2019, the operating mileage of China’s railways has reached more than 139000 km, including 35000 km of high-speed rail, ranking first in the world. In the future, China will form an "eight vertical and eight horizontal" high-speed railway access to provincial capital cities and efficient and convenient connection between regions. Information technology provides technical support for the on-time and high-speed operation and management of high-speed railway itself. At the same time, consumers can log in 12306 and other railway booking systems anytime and anywhere through mobile phones and other Internet terminals, and can book tickets and change their itinerary at any time. All these reflect the influence of information technology on industrial competitiveness.

For another, information technology promotes the rapid development of e-commerce and greatly improves the industrial competitiveness. Information technology promotes the development of e-commerce in enterprises. Enterprises can sign business contracts, sign electronic signatures and make electronic payments in electronic form. Enterprises can carry out e-commerce activities through network service providers. On the one hand, it greatly expands the scope of market and customers; on the other hand, it greatly reduces the cost of business activities and improves the efficiency of business activities.

3.1.4. Performance of information technology for enterprise strategy, enterprise structure and competitors.

Information technology is very important to the strategic realization of enterprises in the industry. It is not only the booster of enterprise strategy realization, but also the reason of enterprise strategic change. In many cases, enterprises must actively adapt to the changes of industry competition rules brought by information technology reform. The change of information technology is likely to bring about the change of enterprise strategy, which will be accompanied by the change of enterprise organization structure. At the same time, the ability of competitors in the industry to use information technology not only threatens competitive advantages, but also promotes the improvement of products and services, thus promoting the competitiveness of the whole industry.

3.2. Analysis of the Impact of Information Technology on Two External Forces

In addition to the four determinants, there are two external forces that can have an important impact on Industrial Competitiveness: opportunity and government.

3.2.1. The impact of information technology on external opportunities. Opportunity is not transferred by people's will, and it can affect the change of four determinants. For the industry, there are several situations that can create opportunities: sudden increase in production costs caused by external factors (such as the oil crisis): major changes in financial markets or exchange rates; dramatic growth in market demand; a major government decision; war or public health events. Many times, opportunities and threats coexist. Here, the author discusses the influence of information technology on the prevention and control of novel coronavirus epidemic. How to use information technology to help a country and region to protect the new epidemic situation has a direct impact on the industrial competitiveness of the country and region. Through the support of information technology, the people can understand the real-time epidemic situation and consciously avoid the areas where the epidemic situation and patients occur. At the same time, information technology through Health Code and other information technology means can understand each citizen's health status and his activity area and track. Information technology has played an important role in the prevention and control of the epidemic. At present, China has effectively controlled the epidemic, and there is no trend of large-scale outbreak.

In conclusion, information technology plays an irreplaceable role in national prevention and control of major health emergencies, for enterprises to quickly resume operation, and to restore the competitiveness of the industry.
3.2.2. The impact of information technology on government functions. The function of the government is to create an environment for industrial development and provide the resources needed by enterprises. The government can create new business opportunities, and the government should play a role in areas where enterprises can’t act, such as developing infrastructure, opening capital channels and cultivating information integration ability. From the government's influence on the four determinants, the main way of government's influence on demand in government procurement is that the government should guide the formation of industrial clusters and promote the matching of industries according to the actual situation. The most important role of the government in industrial development is to ensure that the domestic market is in a free and orderly state of competition, and to promote the industry to maintain healthy competition. In the above role of the government, information technology is an essential technical means for the government.

4. Conclusion
Big data, GPS, image recognition, Internet and other information technologies have penetrated into the production factors of the industry, improving the ability of enterprises to provide products and services. Information technology provides powerful tools and means for the industry to grasp and meet the requirements of customers. Information technology has revolutionized the relevant industries and supporting industries, and improved the competitiveness of industries themselves. Information technology also has a significant impact on corporate strategy and organizational structure as well as the performance of competitors. Information technology has a significant impact on enterprises to grasp industrial opportunities and avoid industrial threats, which have a significant impact on industrial competitiveness.

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