

Digital Transformer: Digital Tools for Enhancing the International Competitiveness of Huawei Enterprises

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Abstract: *A global digital revolution is taking place in business, driven by the rapid rise of digital technologies such as artificial intelligence, blockchain and big data. However, the uneven diffusion of digital technologies has widened the digital divide, which has resulted in our inability to use highly integrated digital technologies to enhance the international competitiveness of enterprises. Based on the theoretical analysis framework of "digital technology-international competitiveness", this paper systematically studies the application of "digital technology" and the evaluation method of "international competitiveness", focuses on the relationship between Huawei's digital transformation path and the improvement of international competitiveness, and compares the differences between separate digital technology and highly integrated digital technology in improving Huawei's international competitiveness. In doing so, it looks forward to the future trend of global companies using digital technology to enhance their international competitiveness. The results of the study show that, on the one hand, digital technology has become a key driver of international competitiveness and that, in order to have a more pronounced effect, we have opted for highly integrated digital technology rather than separate digital technologies. On the other hand, while improving the international competitiveness of companies, we need to remind companies of the need to pay attention to the privacy and security of consumers and the financial security of companies.*

Keywords: *Digitalisation; international competitiveness; Huawei; Internal and external environment analysis*

1. Introduction

Global digital development to today has a very high degree of consensus, is currently in a golden period of development, the future has a huge space for development ^[1]. Digitalisation is inextricably linked to the international competitiveness of individual companies as a driver of economic growth ^[2]. Huawei Enterprises is among the international leaders in the communications, high-tech and e-commerce industries. Enhancing international competitiveness is a top priority for every company and an important indicator of its position in the international arena ^[3]. Usually in every period of time, there are high-tech tools that leapfrog the times and are used to enhance the international competitiveness of companies.

The rise of digital technology in the last 10 years has led to headline companies in various industries taking the lead in using digital tools to improve the international competitiveness of their businesses ^[4]. Huawei has moved from localised digital reform to overall digital reform across all sectors of the business, from a single application technology to the convergence of mainstream core technologies, using blockchain, artificial intelligence and big data technologies to build a large and flexible digital integrated system ^[5]. The international competitiveness of an enterprise refers to the ability of an enterprise to create value and sustained economic growth of the enterprise in comparison with the competitiveness of individual enterprises in the context of the world economy ^[6].

Artificial Intelligence (AI) in digital technology is technology that enables machines to reason in a human-like manner and make decisions autonomously. By using large amounts of data for training, AI technologies are able to spot patterns and trends, proactively solve problems, and predict future situations and events ^[7]. Blockchain technology in digital transformation is a new application model based on the integration of a series of technologies ^[8]. Blockchain contains the computer technology of distributed data storage, peer-to-peer transmission, consensus mechanisms, and cryptographic algorithms. Through cryptographic algorithms, a large amount of information stored in the block is

sequentially connected in the order of its occurrence time and the data chain is formed, which can be divided into public chain, alliance chain and private chain according to the access and management authority of the data chain, which can solve the contradiction between buyers and sellers in e-commerce to a certain extent ^[9]. Big data technology in digital transformation is a part of digitalisation. Digitalisation refers to the digital transformation of all aspects of the logistics supply chain to achieve the goals of data sharing, information transparency and process optimisation. And big data technology is a technology of data processing and analysis, which helps enterprises discover business opportunities, improve business decision-making, and improve products and services by collecting, storing, processing and analysing massive data ^[10].

Overall global digitalisation is in a golden period, with high priority being given by governments and businesses ^[11]. Huawei also believes that the era of digital business has arrived, and a major change in technology has begun; the core of the future is actually based on AI, enabling intelligent automation and intelligent innovation ^[12]. Huawei has gone from pilot innovation in the past to innovation at scale today, and value has gone from single-point value to customer value as well as ecological value.

2. Materials and Methods

2.1 Tools for Digital Transformation

The advent of the digital age has led to huge changes in various industries. This depends on the development of digital technologies, which have sparked a digital revolution over the past decade with the rapid rise of blockchain technology, artificial intelligence, big data, cloud computing, virtual and augmented reality, and the Internet of Things (IoT). Among the digital tools mentioned above, the most useful for international competitiveness are blockchain technology, artificial intelligence technology and big data technology, as shown in Table 1.

Table 1: Core digitalisation tools

Categories	Description
Blockchain Technologies	An advanced database mechanism that allows information to be shared transparently across an enterprise network.
Artificial Intelligence	Used to teach computers to process data in a manner inspired by the human brain.
Big Data	The ability to quickly obtain valuable information from a wide variety of types of data.

As shown in Figure 1, blockchain databases store data in blocks, while databases are linked together in a chain. The data is consistent in time, as the chain cannot be deleted or modified by the business without network consensus. As a result, businesses can use blockchain technology to create immutable ledgers for tracking orders, payments, accounts and other transactions.

A neural network is a machine learning process that uses neurons in a hierarchical structure similar to the human brain that allows the creation of adaptive systems, which computers use to learn from their mistakes and continuously improve. Thus, artificial neural networks can attempt to solve complex problems such as making decisions for supply chain allocation problems in e-commerce.

Big data is a collection of data whose content cannot be captured, managed and processed within a certain time frame using conventional software tools. Technologies applicable to big data include massively parallel processing databases, data mining grids, distributed file systems, distributed databases, cloud computing platforms, the Internet, and scalable storage systems.

Digital technology refers to the use of modern computer technology, the traditional form of a variety of information resources into a computer can recognise the binary code digital technology. Of course, this includes big data technology, blockchain technology and artificial intelligence technology, these technologies are accompanied by computer science and technology, it refers to the use of certain equipment will be a variety of information, including: graphics, text, sound, image, etc., into a computer can identify the binary digits of "0" and "1" after arithmetic, processing, storage, transmission, dissemination and restoration of technology.

2.2 Tools for Competitiveness Assessments

The international competitiveness of an enterprise refers to the comprehensive ability of an

enterprise to enhance its own value in the international market on the basis of creating value for its customers by cultivating its own resources and capabilities, acquiring external addressable resources and utilising them in an integrated manner under competitive market conditions.

The internal analysis of the enterprise is the analysis of the financial situation of the enterprise carried out by the internal management of the enterprise. From within the enterprise on the enterprise itself the whole process of operation, supply, production, sales stages, people, money, material aspects of the operation and its results of the economic activities of the analysis. Including profit analysis, sales analysis, product analysis, production analysis, resource use analysis, capital analysis.

External analyses are analyses of the financial situation of an enterprise carried out by parties external to the enterprise, such as state regulatory agencies, investors, creditors, suppliers, etc., according to their own requirements.

SWOT analysis is based on the internal and external competitive environment and competitive conditions of the situation analysis, is closely related to the subject of the study of a variety of major internal strengths, weaknesses and external opportunities and threats, etc., through the investigation of enumeration, and in accordance with the matrix form arrangement, and then with the idea of systematic analysis, the various factors are matched to be analysed, and a series of conclusions are drawn from the corresponding conclusions, which usually have a certain decision-making, which can better help consumers to choose the brand, for suppliers and investors to provide a certain reference.

3. Experiments

We made two main parts of the analysis, the first part is about the high integration of artificial intelligence technology, big data technology and blockchain technology, because a single digital technology for the company's office efficiency is minimal and the effect on international competitiveness is not obvious. We made a high level of integration of AI technology, big data technology and blockchain technology and analysed how companies should implement this highly integrated system.

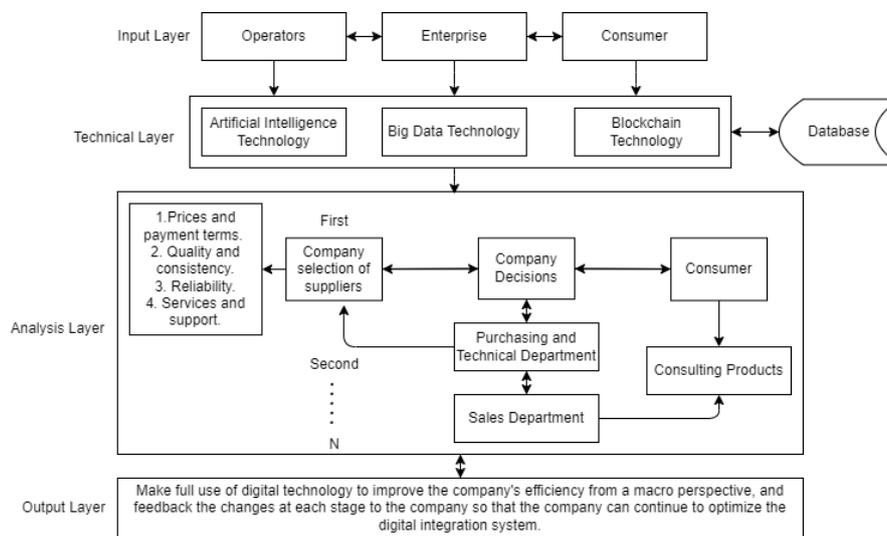


Figure 1: Digital highly integrated systems

As shown in Figure 1, the company selects N suppliers according to its products. This is due to the stability of the company in manufacturing the products, and multiple suppliers can avoid the problem of shortage of raw materials for the products.

The following four points are met by all Huawei-selected suppliers:

- 1) Price and payment terms;
- 2) Quality and consistency;
- 3) Reliability of suppliers;
- 4) Service and support.

And Huawei in particular is particularly strict about quality and consistency, which means that the suppliers you choose must provide products and services that consistently meet Huawei's requirements. Ensuring that there is no fluctuation in the quality of products and services provided by suppliers is directly related to the stability of Huawei's business and customer satisfaction, and has always been Huawei's goal in selecting suppliers. Huawei's technical and purchasing departments work together to further qualify the supplier's products before the company makes a final decision.

When consumers buy a product, they usually compare different brands and finally carefully evaluate the attributes of a particular product, brand or service and make a choice to buy a product that meets a particular need. Huawei's sales department takes the results of the technical and purchasing departments' appraisals, wraps them in language, and recommends the corresponding products to the customer. Customers make comments on Huawei's products after purchasing and using them. Huawei will first go through big data technology to compare how often such comments appear. The more often they appear, the more quickly the company can solve problems with its products and services. The company will then use AI technology to provide feedback on such issues, offering several solutions for the company's top executives to make final decisions. The blockchain technology saves all the important issues and the various options for solving the problem each time. This will greatly improve the impact of the company.

We make full use of digital technology to improve the efficiency of the company's office at a macro level, feeding back changes at every stage so that the company can continually optimise the digitally integrated system to provide better service to our customers.

To be able to objectively assess Huawei's international competitiveness and facilitate practical recommendations for the company, we analysed the internal and external environment of the company before the SWOT analysis.

Analysing the enterprise's external environment from Huawei's strategic point of view is to grasp the current situation and changing trends of the environment, to take advantage of the opportunities conducive to the development of the enterprise, and to avoid the threats that the environment may bring, which is the first and foremost issue for the enterprise to seek survival and development. The external environment of a company can be organised into six dimensions: economic factors, political factors, market factors, production technology factors, demographic factors and social factors. In general, some political factors have a direct impact on business behaviour, while others have an indirect impact on business activities.

Table 2: Assessing the importance of external environmental factors (Huawei)

Factors	Assessment parameters (Maximum 5 points)
1. Economic factors	4
2. Political factors	5
3. Market factors	2
4. Digital technological factors	4
5. Population factors	3
6. Social factors	2

Table 2 shows that political, economic and production technology factors have the greatest influence on the external factors of the firm.

The economic factors in the group of six factors in our Table 2 above include, among others, inflation rate and currency exchange rate stability. Social factors include, inter alia, customs policies and investment policies. Market factors mainly include the intensity of competition and overcoming barriers to entry. Technological factors mainly include opportunities for new technological development and the rate of technological innovation. Population factors include, inter alia, population growth rate and population size. Social factors include, inter alia, social tensions in society and the level of supply in the labour market.

We assessed Huawei's external environment by a single factor in different factor groups, mainly referring to the diagnostic results of experts and the impact of a single factor on Huawei for a comprehensive analysis.

We assessed Huawei's external environment by a single factor in different factor groups, mainly referring to the results of the expert diagnosis and the intensity of the impact of the single factor on Huawei for a comprehensive analysis. The final results show that the results of the expert diagnosis and the intensity of the impact of a single factor on Huawei are basically consistent, which on the other

hand reflects the authenticity and comprehensiveness of our assessment.

Table 3: Assessment of the external environment (Huawei)

Group of Factors	Single Factors	Assessment of Factors			Strength of Impact
		-5	Expert Judgement	+5	
1.Economic factors	1.1 Inflation rate		4		4
	1.2 Currency exchange rate stability		3		3
2.Political factors	2.1 Customs Policy		4		5
	2.2 Investment Policy		5		5
3.Market factors	3.1 Intensity of competition		3		2
	3.2 Overcoming barriers to entry		2		2
4.Digital technological factors	4.1 Opportunities for new technological developments		4		4
	4.2 Rate of technological innovation		4		4
5.Population factors	5.1 Population growth rate		3		2
	5.2 Population size		2		2
6.Social factors	6.1 Social tensions in society		3		2
	6.2 Level of supply in the labour market		2		2

As shown in Table 3, we conducted external analyses of Huawei through six different factor groups, and the final results show that Huawei's external environment is basically in a smooth state and does not negatively affect the company's international competitiveness.

We have assessed Huawei's external environment, but this is at a macro level in terms of the company's development and the enhancement of its international competitiveness, and we are now assessing Huawei's internal environment.

Table 4: Assessing the importance of internal environmental factors (Huawei)

Factors	Assessment parameters (Maximum 5 points)
1. Digital Transformation Technologies	4
2. Control Systems	4
3. Human Resources	5
4. Marketing	4
5. International Logistics	3
6. After Sales	3

As shown in Table 4, the main influencing factors for Huawei's current internal environment contain the following six factor groups. Digital transformation technology, control system, human resources, marketing, international logistics, and product after-sales.

Enterprise control system refers to a kind of integrated software that can embody most of the functions of enterprise management, including decision-making, planning, organising, directing, monitoring and analysing, etc., and can provide real-time, relevant, accurate and complete data to provide managers with a basis for decision-making, including ERP system, CRM system, HRM system, financial management system, project management system and OA system.

Human resources, or personnel, in its broadest definition refers to human resource management work, including six modules: human resource planning, recruitment, training, performance, compensation and labour relations. It is an important module of the company. Huawei's staff recruitment, training, staff appraisal, staff remuneration and staff transfer are all related to personnel.

Marketing is the process by which goods or services are transferred from producers to consumers, and is a set of activities carried out by businesses or other organisations focused on satisfying consumer needs. Marketing is both a function and an activity, process and system by which Huawei creates, communicates, disseminates and delivers customer value for its own benefit and that of its stakeholders, thereby creating economic value for its customers, clients, partners and society at large.

International logistics, also known as global logistics, is very important for Huawei to enhance its international competitiveness, production and consumption are carried out independently in more than one country, in order to overcome the spatial and temporal distance between production and consumption, the physical movement of materials, an international commodity trade or exchange activities, so as to complete the ultimate purpose of international commodity trade, that is, the seller's

delivery of the document, the goods and the collection of payment; and the buyer The buyer accepts the documents, pays the price and receives the goods under the conditions of convective trade.

After-sales service refers to a series of services provided by merchants to protect customers' rights and interests and improve customer satisfaction after the purchase of goods. Huawei's after-sales services usually include after-sales consultation, product warranty, return and exchange services, etc., with the aim of providing customers with a better post-purchase experience, thereby enhancing customer loyalty and word-of-mouth.

The purpose of analysing the internal environment or conditions of the business is to understand the current situation of the business and to identify the strengths and weaknesses of the business. It helps companies to formulate targeted strategies to improve their international competitiveness, to use their own resources effectively and to make full use of their strengths, while avoiding their weaknesses or adopting a positive attitude to improving their weaknesses. It is more helpful to avoid weaknesses and build on strengths.

Table 5: Assessment of Internal Environmental (Huawei)

Group of Factors	Single Factors	Assessment of Factors			Strength of Impact
		-5	Expert Judgement	+5	
1. Digital Transformation Technologies	1.1 Extent of digital transformation	4			4
	1.2 Rate of use of digital technology	4			4
2. Control Systems	2.1 Utilisation ratios of control systems	4			4
	2.2 Efficiency of control systems	3			4
3. Human Resources	3.1 Proportionate distribution of human resources	4			5
	3.2 Appraisal of human resources	3			5
4. Marketing	4.1 Marketing Effectiveness	3			4
	4.2 Marketing Strategies	4			4
5. International Logistics	5.1 Stability of logistics	3			3
	5.2 Timeliness of logistics	2			3
6. After Sales	6.1 After-sales technical support	3			3
	6.2 Speed of product sales	2			4

As shown in Table 5, although Huawei belongs to the frontline battle of digital transformation companies, there are still some flaws, and this flaw is mainly reflected in Huawei's lack of highly integrated use of digital technology. Huawei's control systems are highly coupled and need to be decoupled using digital technologies as well as in conjunction with the company's organisational structure. The HR system is crucial for Huawei, because Huawei's business is wide and involves more countries and fields, so it needs more talents from various countries, which can eliminate the language barriers. Marketing is quite important for Huawei to enhance its international competitiveness as it determines to a certain extent the company's visibility in the international arena. International logistics is an important indicator of a company's integrity, and Huawei has certain shortcomings in international logistics. After-sales service is the most relevant indicator for users in addition to price and quality, although Huawei is more humane in terms of after-sales service, provides technical support, and the speed of after-sales service is more objective, but there is a need to continue to improve the service of after-sales service.

After evaluating Huawei's internal and external environments, Huawei has a lot of bright spots in its internal and external environments, but there are still areas that need to be improved, so we can get a SWOT analysis matrix about Huawei, and after the SWOT analysis matrix, we will put forward practical suggestions for Huawei's deficiencies, which include the use of a highly integrated digital system to improve Huawei's international competitiveness.

SWOT analysis matrix is based on the internal and external competitive environment and competitive conditions of the situation analysis, is closely related to Huawei's main internal strengths, weaknesses and external opportunities and threats, etc., in accordance with the matrix form to summarise and arrange, and then use the idea of systematic analysis of the various factors match each other to analyse, from which a series of corresponding conclusions, and the conclusions are usually with a certain degree of decision-making.

As shown in Table 6, the SWOT analysis matrix of Huawei shows that Huawei has completed its

initial digital transformation and now needs to highly integrate AI technology, big data technology and blockchain technology into a digital system.

Table 6: SWOT matrix analysis (Huawei)

	Opportunities 1. Growing 5G market. 2. Invest in new technologies. 3. Collaborate with other companies.	Threats 1. Competition from other products. 2.Changes in technology and consumer preferences.
Advantages 1. Technological innovation. 2. Wide range of products. 3. High quality products.	Opportunities - Advantages 1. Uses its innovative technologies to meet growing demand. 2. One of the world's leading high-tech companies.	Threats - Advantages 1. Advantages exist in extensive supply chain networks. 2. Diversified business models can reduce the economic impact of certain regions.
Weaknesses 1. Reputational risk. 2. Personnel problems. 3.Market dependence.	Opportunities - Weaknesses 1.To be able to attract new talent and reduce brain drain in the face of growing demand. 2. Improve the working conditions and motivation of employees.	Threats - Weaknesses 1. High labour costs are a vulnerability in a highly competitive environment. 2. International business expansion is risky.

This digital system, in turn, continuously improves the problems that exist in the internal and external environment, and then Huawei's decision makers take all or part of the recommendations. The most important purpose of using the digital integration system is to create an internal cycle through Huawei and to significantly improve international competitiveness.

4. Discussion and Conclusion

This study aims to improve Huawei's international competitiveness through a high degree of integration of digital technologies. We analyse the synergies between AI, Bigdata and Blockchain technologies, and assess Huawei's current internal and external environments, and provide optimised solutions based on the results. The results show that by using a highly integrated digital system, Huawei can not only improve the efficiency of its offices and give consumers a better consumer experience, but also greatly enhance its international competitiveness.

Although highly integrated digital technologies can indeed greatly enhance Huawei's international competitiveness, the digital technologies we considered in this study are not comprehensive. In the next study, we will add cloud computing technology and Internet of Things technology to re-evaluate whether the impact of highly integrated digital systems on Huawei's international competitiveness has been enhanced.

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