



Driving Digital Transformation in the Food Industry

Yuqing Huang^(✉) and Zheng Liu

Shanghai University of Engineering Science, Shanghai, China
h962021594@163.com

Abstract. With the rapid development of science and technology, the food industry as a traditional manufacturing industry should respond to the call and actively promote intelligent development. Taking the food industry as the research object, this paper first analyzes the current situation and future development trend of the digital development of the food industry, then puts forward corresponding development suggestions accordingly. The food industry should integrate digital technologies into all stages of the food supply chain to improve the level of intelligence in the industry.

Keywords: Food industry · Digital transformation · Development prospects · Development status · Policy recommendations

1 Introduction

Combing through the existing literature, it can be found that there have been many studies that have studied the digital transformation of the food industry. Annosi et al. [1] analyse the main challenges faced by businesses in the agri-food industry in the use and adoption of digital technologies and provides avenues for future research. Ammar Mohamed Aamer et al. [2] pointed out that the Internet is one of the disruptive technologies employed in food supply chain management. Qing Sun et al. [3] researched and analyzed the key challenges faced by businesses in the agri-food industry in the use and adoption of digital technologies. Aaron Hand [4] pointed out that machine vision has long had a place in the field of food safety. Mehrdad Tajkarimi [5] pointed out that the current limiting factor in the food industry is that it has more data than it can analyze and process. Jiayu Zhaung et al. [6] proposed a new intelligent food consumption data collection and analysis system. B.S. Sridhar et al. [7] pointed out that the emergence of high-speed personal computer systems and the development of new artificial intelligence tools such as computer software packages and fuzzy logic have opened up a lot of opportunities for the food industry. Varsha Sahni et al. [8] He points to artificial intelligence or machine vision playing an overwhelming role in the field of food processing and quality affirmation.

In summary, most of the existing literature is a study on the use of digital technology to manage food safety, as well as a comparative analysis of the digital development of China's food industry with other industries, and some literature analyzes the challenges

and opportunities faced by the food industry. This paper takes China's food industry as the research object, and the content can be divided into three aspects: the status quo of digital transformation, the development trend of digital transformation, and the development strategy of digital transformation, which provides a certain research basis for food to promote the digital transformation of enterprises.

2 Development Status

In recent years, China's food industry market is developing rapidly, and accompanied by flexible and changeable characteristics. With the advent of the era of intelligent manufacturing, many food industries in China have begun to embark on the road of digital development, such as the use of information technology by enterprises to reasonably determine the production volume of products, inventory, etc., in order to reduce the emergence of inventory accumulation. The high degree of integration of food manufacturing processes and digital technologies reduces the difficulty and working hours. However, in the process of implementing intelligent manufacturing, there are still many deficiencies, and on the whole, the food industry is still in its infancy in the process of digital promotion, and there is still a large room for development.

2.1 Digital Management Processes Are Complex

Although the food industry is a kind of traditional manufacturing industry, it has the characteristics of short shelf life, high safety requirements, and strict storage and transportation conditions compared with other manufacturing industries. It is precisely because of these particularities of food that food enterprises have a more complex process in the process of information management, and they must strictly control the high standards of food quality, inventory and transportation conditions.

2.2 Digital Transformation is Difficult

First of all, the food industry market changes rapidly, and along with the development of various promotional activities on various festivals on the e-commerce platform, it may affect the transformation of some food off-peak seasons. Secondly, the diversity of consumer demand, due to the significant improvement of people's living standards, consumer demand for food from safety and health to healthy nutrition and delicious transformation. Finally, there are many kinds of food, due to the variety and miscellaneous food, and the demand for various products is different, the use of digitalization for daily food can be mass production, but for some high-end, customized food it is difficult to use digital production.

2.3 Digital Development Prospects Are Great

As a people's livelihood industry, the food industry has great prospects for development under the background of relevant national policy support. Due to the prevalence of digital technologies, the entire process of food and its processing industry, from food production

to sales to consumers, is undergoing profound changes. At present, more enterprises in China's food industry have embarked on the road of digital transformation, and under the background of domestic and foreign development double cycle and the new consumption era, the future digital development of China's food industry is imperative.

3 Trends

In the era of double circulation and new consumption, the development mode of the entire industrial chain of the food industry from production to sales is undergoing profound changes. The food industry should take digitalization and informatization as the breakthrough point of transformation, and gradually form the intelligence of the industrial chain, so as to lead the digital development of the entire industry.

3.1 Digitalization is Applied to Food Production

In food production, digitalization is mainly applied to the determination of production quantity, the improvement of production speed and the control of production quality. First of all, in terms of production quantity, food enterprises can use the production management system of enterprises to reasonably and accurately control the production quantity, so as to avoid the phenomenon that the output is small and cannot meet the needs of consumers well or the excessive output causes food inventory to accumulate, thereby reducing the profit of the enterprise. Secondly, in terms of production speed, for some daily and large-scale food, the use of machine production or manual machine combination of production methods can greatly improve the production speed of food. In terms of production quality, the full use of digital technology and strict control of every aspect of the production process can ensure food safety.

3.2 Digitalization is Applied to Food Inventory Management

In terms of food inventory management, on the one hand, due to the high requirements of food inventory conditions, such as temperature, humidity, etc., compared with manual care, the use of digital supervision and storage can better ensure that the storage conditions meet the requirements, thereby improving the quality of food. On the other hand, the use of digital technology to regularly check whether the quality of inventory products meets the requirements, and rationally dispose of those food that do not meet the quality requirements to ensure the quality and safety of the remaining inventory products.

3.3 Digitalization is Applied to Food Transport Management

In terms of food transportation management, enterprises can use digital technology to calculate the optimal plan for transportation to shorten the transportation distance, thereby reducing food loss, improving transportation efficiency and reducing transportation costs. Secondly, for those foods that need to be transported in the cold chain, digital technology can be used to develop low-carbon emission reduction refrigerated transport vehicles, so that these foods can reduce carbon emissions while keeping fresh during transportation.

3.4 Digitalization is Applied to Food Sales

In terms of food sales, on the one hand, the use of personalized and rich sales methods will increase consumers' willingness to spend. Due to the diversity and personalization of consumer needs, it is difficult to fully meet the preferences of consumers by relying on the design inspiration of enterprise personnel alone, which requires the use of digital technology to customize personalized sales solutions for consumers. On the other hand, the digital system is used to reasonably determine the retail price of food according to the market price, output and consumer demand, with the goal of maximizing corporate profits.

4 Tactics

Food enterprises should accelerate industrial upgrading and digital transformation and upgrading, conform to the general trend of digital development, optimize traditional manufacturing technology, and take intelligence as the driving force for the development of enterprises to improve quality, increase efficiency, reduce costs and reduce deposits for the food industry.

4.1 Vigorously Publicize and Promote Digital Transformation

The advent of the data age means that the digitalization of the food industry is an inevitable development trend in the future. However, some food companies do not have a strong awareness of the development of digital production, and they do not fully use digital technology to manage the whole process of food production, storage, transportation, sales and other supply chains. This requires the government and relevant departments to actively carry out some publicity activities to vigorously promote the advantages of digital development of the food industry and its inevitable position in the future social development.

4.2 Create a Digital Operating Model for Enterprises

The operating mode of the enterprise includes R&D design, production and manufacturing, inventory storage, sales and transportation and other processes, enterprises should integrate digital information technology into every aspect of enterprise operation, the use of intelligent technology to optimize production, storage, sales and other stages, so as to achieve the full allocation of resources and the maximization of corporate interests, to create a digital food enterprise.

4.3 Promote the In-Depth Development of Enterprise Digitalization

At present, the digital development of most food companies is still in its infancy, and there is still a certain gap from deep integration. Therefore, food enterprises should vigorously introduce digital machines and high-quality talents to provide a material foundation for the successful digital transformation of enterprises, and promote the integration of enterprise digital business to enterprise-level integration and ecological integration.

4.4 Introduce Funding Policies to Help Enterprises Digitally Transform

Most of the food companies are small and medium-sized enterprises, the scale is not large, and the cost of realizing digital transformation is more stressful for these enterprises, so they will be discouraged to a certain extent. The state and financial institutions should give certain loans and preferential policies to these digitally transformed food enterprises to encourage the digital transformation of these enterprises and provide financial support to these enterprises.

5 Conclusions

In general, the intelligent food industry is the general trend of future development. The digital upgrading of the food and its processing industry is to use information technology to connect the upstream and downstream of the entire industrial chain. Through the standardization of facilities, logistics, warehousing, production management, quality management and other links, the deep integration and coordinated development of the whole industrial chain are realized. In order to promote the digital transformation of the food industry, the government should vigorously promote food intelligence and provide policy support for relevant enterprises. The food industry should respond to government support to create a digital operation model for enterprises.

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