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The Development of Business Model of New Construction Machinery Industry Integrating Information Technology

Zhaoyang Wu

Qinghai Normal University, Qinghai, China

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Abstract: The level of informationization determines the competitive market position of the new construction machinery industry, and the development of any enterprise is inseparable from the construction of the enterprise by informationization technology. In order to improve the competitiveness of the CM industry, it is necessary to evaluate the business model development of the industry. Therefore, taking A CM company as an example, this paper studies the development status of its CM products under the change of information technology construction, accelerates the upgrading of enterprise products by using the support policy of high-tech industry and the policy of encouraging innovation, and formulates a commercial competition strategy suitable for the development of A's machinery products to provide a guarantee for the healthy and sustainable development of the CM industry.

1. Introduction

The CM industry is a monopolistically competitive industry, where there are both sufficient market segments to allow companies to differentiate and a certain degree of substitutability, and companies must carefully study the strategies of their rivals and develop their own strategies so that they can know their rivals and gain competitive advantages in the fierce market competition or avoid a fish-out-of-water competition with powerful rivals [1]. Therefore, enterprises within the CM industry must carry out industry competition analysis and, on this basis, develop business development strategies that are different from those of their competitors.

Many scholars have made a lot of studies on the impact of information industry or information technology on the development of CM industry. At the theoretical level, some scholars analyze the mechanism of information technology innovation on the promotion of knowledge economy,

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suggesting that information technology innovation improves economic efficiency at the micro level and accelerates knowledge accumulation and promotes human capital at the macro level, thus promoting economic growth. It is also pointed out that information technology has a strong penetrating effect on traditional industries and can accelerate the adjustment of industrial structure [2]. In the research of informatization in the machinery industry, some scholars analyzed the current situation of the development of informatization in China's machinery industry and chose the development path of introducing ERP, SCM, CRM business concepts, improving the process control system and the functions of CIMS, and establishing an evaluation system to evaluate the level of informatization in the CM industry, but its evaluation index system is too biased towards the scale of enterprises [3]. In short, the development of the CM industry is based on the construction of information technology, and the road to the construction of the evaluation system for the development of business models in this industry is being explored.

This paper firstly introduces three development trends of the new CM industry and analyzes the development status of the CM industry in the information technology era, including CM development problems and development countermeasures. Then it evaluates the business development model of mechanical products of A CM company by analyzing the enterprise organization structure and development competitiveness of the company, and finally proposes a business development strategy for A company.

2. Analysis of the Development of CM Industry

2.1. New CM Industry Development Trend

Development trend toward plateau-type CM. In order to meet the demand for engineering development in the western development plan, it is necessary to develop machine types that can meet the engineering construction in plateau areas, which requires CM to have high reliability and availability in such construction areas [4].

Development trend toward special type of CM. In order to operate in special environments such as in toxic, harmful, corrosive, high temperature and other special environment needs, special type CM should be developed, such as the high temperature operation of steel slag processing slag catching machine, CM operating in the fire scene or in the ruins, shear CM for demolition of reinforced concrete columns after blasting, etc. They all have great development prospects [5-6].

To the development trend of agricultural-type CM. With the rapid development and expansion of the scale of rural urbanization, as well as the implementation of farmland transformation, the vast number of rural areas in China need a large number of small, simple, practical, inexpensive, easy to operate and maintain agricultural-type CM, and this need is large in quantity and wide, so agricultural-type CM is also the future direction of development of China's CM industry can not be underestimated [7-8].

2.2. The Development Status of CM Industry in the Information Era

At present, China's CM industry still has numerous problems in the economic system and mechanism, which need to be improved. It can be said that the key to the current restriction on the competitiveness of China's CM industry is not a technical and financial problem, but an institutional and systemic problem [9]. Specifically, it is manifested in the following aspects: the transformation of the system and mechanism of state-owned CM enterprises is not yet in place; the industry management system is divided, and the related capacity is not systematic; the lack of equal market

competition mechanism; the lack of an overall strategy and institutional guarantee of industrial localization; the legal environment is not perfect, etc [10-11]. All these affect the development of domestic CM industry and its technological innovation.

Of course, for the problems faced by the development of the CM industry, many solutions have been proposed. Such as increasing openness and actively using foreign capital; vigorously adopting high-tech represented by information technology to improve the technical content and complete sets of advantageous characteristic products and equipment [12]; giving priority to supporting the improvement of innovation ability of key large enterprises and private enterprises to enhance the vitality and vigor of industry development; putting the first priority on improving the market competitiveness of products and economic efficiency of enterprises to promote the CM manufacturing industry The guiding ideology of development on a new level and positioning the focus of CM industry development on new products such as forklifts and industrial storage and handling sets, hydraulic excavators and hydraulic roadheading machines [13-14].

3. Evaluation of Business Model Development of A CM Company Under Information Technology

3.1. Organizational Structure of the Company

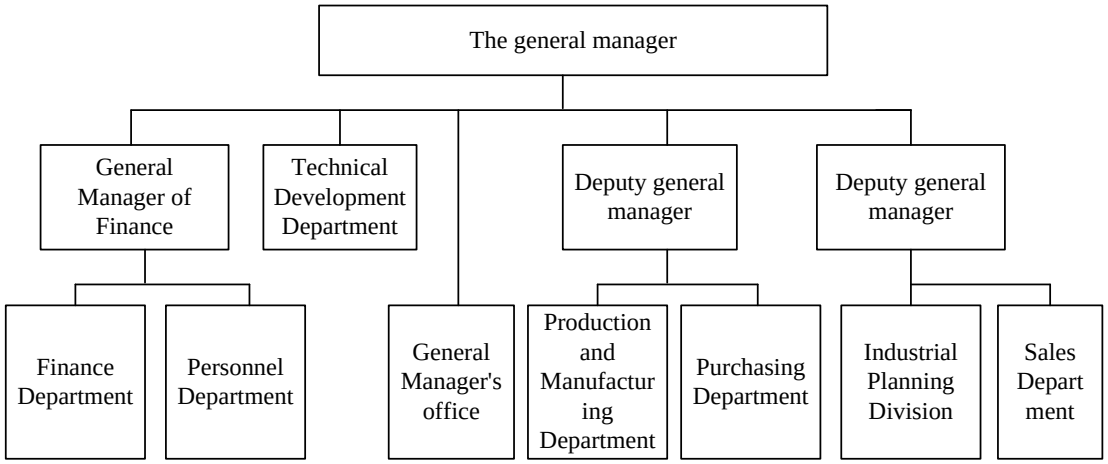

Figure 1. Organizational structure of Company A

Company A set up such an organizational structure as Figure 1 mainly has these characteristics. One is that the management level is simple, the responsibilities of each functional department are clear, and the management authority is relatively centralized, which improves the flexibility of management, strengthens the speed of response to the market, and facilitates the general manager to coordinate and command the deployment of resources [15]. Second, from the perspective of the company's overall organizational structure, the division of responsibilities of each position in management according to the principle of centralized leadership of similar boards is conducive to coordination within the system [16]. However, the lack of flexibility in the mutual coordination between the operation system, the financial system, and the sales system forms a management information exchange barrier and makes it easy for mutual shirking of responsibilities when coordinating cross-departmental issues [17]. Since the overall strength and scale of the company is not yet large enough, coordination among functional departments is still relatively easy, conflicts are not yet prominent, and the current organizational structure is still operating effectively [18-19].

3.2. Analysis of the Competitiveness of Company A's Business Model Development

(1) Main business revenue

Table 1. The proportion of main business income of CM products

	Concrete Machinery	Excavation Machinery	Lifting machinery	Piling Machinery	Road Machinery	Other
2020	29.65%	36.71%	15.38%	6.54%	7.47%	4.25%
2021	30.27%	38.94%	16.52%	5.26%	4.62%	4.39%

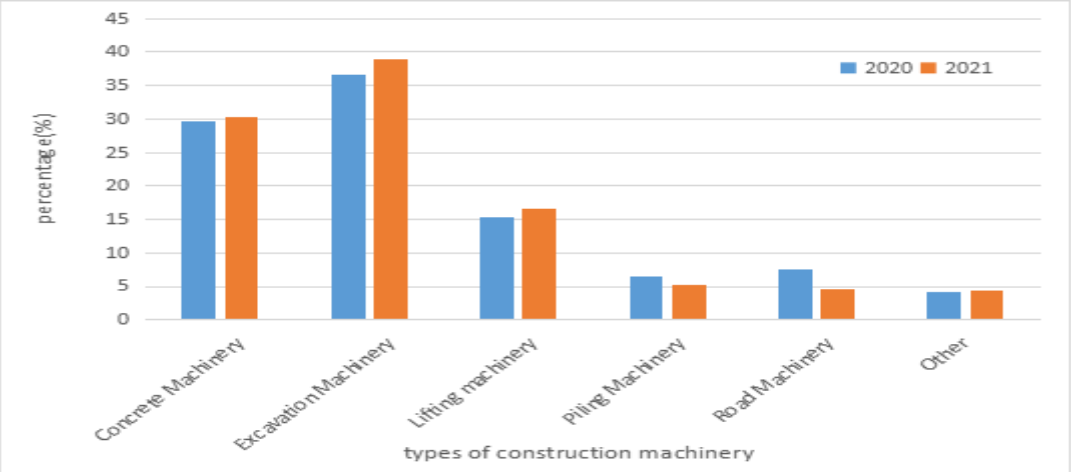

Figure 2. Composition of main business revenue of CM Company A (%)

As can be seen from Table 1 and Figure 2, the largest revenue source of Company A's main business income is excavation machinery, followed by concrete machinery. According to the analysis of sales revenue in the company's 2021 annual report, the excavation category accounted for 38.94% of the main business revenue, an increase of 6.07% compared with the previous year; the concrete category accounted for 30.27%, an increase of 0.62% compared with 2020; the lifting machinery category accounted for 16.52 in 2021; the piling machinery category decreased by 1.28% compared with 2020. The main business income structure is stable, and the difference in the structure share between 2020 and 2021 is not significant.

(2) Sales competitiveness

Table 2. Sales volume and market share of major products

Products	Capacity	Sales	Market share
Concrete Machinery	1462 units	983 units	11.23%
Excavation Machinery	4237 units	4065 units	59.37%
Lifting machinery	754 units	218 units	4.95%

As shown in Table 2 is the sales volume and market share of three types of products of Company A: concrete machinery, excavation machinery and crane machinery. As can be seen from the table, 1462 units of concrete machinery were produced and 983 units were sold, with a market share of 11.23%; 4237 units of excavation machinery were produced and 983 units were sold, with a market share of 59.37%; 754 units of crane machinery were produced and 218 units were sold, with a market share of 4.95%.

(3) Investment in fixed assets

Table 3. Investment in fixed assets (million yuan)

	Concrete Machinery	Excavation Machinery	Lifting machinery	Piling Machinery	Road Machinery	Other
2020	24563	43568	18363	13246	974	683
2021	28798	51420	21172	13951	1035	817

CM is an investment-driven product, and its total social demand is influenced by the government as well as private investment plans, especially the government infrastructure demand can greatly drive the demand for CM. As shown in Table 3, Company A's current fixed investment in CM products has been increasing in these two years, especially the investment in excavation-type machinery has increased from 435.68 million yuan in 2020 to 514.20 million yuan in 2021, which is the largest increase in investment.

3.3. Business Development Model Evaluation

Usually the evaluation of business development model will adopt the principal component analysis method, which is a linear transformation of multiple linear variables, intercepting the subject containing most of the information and reducing the dimensionality to a set of lesser indicator quantities. These indicator quantities are a collection of the original multiple information variables, as a way to analyze the information in a multivariate system. This can retain most of the information of the principle information as a whole, as a new combination of indicator system to evaluate. In the evaluation of the CM business development model, the CM products are used as the principal components of the evaluation.

The matrix of principal component factor X is.

$$X = \begin{pmatrix} x_{11} x_{12} \cdots x_{1p} \\ x_{21} x_{22} \cdots x_{2p} \\ \cdots \quad \cdots \\ x_{n1} x_{n2} \cdots x_{np} \end{pmatrix} = (X_1, X_2, \ldots, X_p) \tag{1}$$

The composite score of the principal component analysis was calculated by the formula

$$v_i = x_i / (x_1 + x_2 + \ldots) \tag{2}$$

Where vi represents the principal component score, xi represents the types of CM products, x1 represents concrete mixing machinery and x2 represents excavation machinery.

The CM industry is vibrant and booming, and the complexity of the market environment should make opportunities and challenges coexist. According to the above analysis of the competitiveness of A CM company from three perspectives of main business income, product sales and fixed asset investment, it is known that A should mainly promote excavation type machinery, followed by soil mixing machinery, and these new CM type products should adapt to the competitive strategy of industry development.

4. A CM Company Business Model Development Strategy Selection

(1) Green development strategy

In the product development strategy, the company needs to consider how to implement the development and promotion of new products in the existing market, such as the upcoming non-road machinery, heavy-duty diesel engine environmental standards bring a wave of replacement, which requires the development of new products in line with the trend. In the context of the rapid development of economic globalization, environmental protection policies are becoming more stringent, the international market for CM product quality performance requirements are different, the heterogeneity of the product demanded by various industries, A company to face different customer groups, the development of standard-compliant, environmentally friendly green machinery products, in the premise of high quality, high performance, to provide low-cost green products more conducive to its occupation of the market.

(2) Concentrated development strategy

Company A implements business growth strategy and scale expansion strategy based on underground piling machinery market segmentation, characterized by technology leadership and product differentiation, with the prerequisite that domestic and international CM market can maintain appropriate growth rate in the next five years. The average growth rate of the industry is 20%-25%, the market concentration is not high enough, and the enterprises in the industry are fully capable of finding market segments suitable for their own characteristics, and the implementation of market expansion strategy by Company A will not be at the expense of market losses of other major competitors, thus there is no strategic conflict yet. The concentration of human, financial and material resources implemented around this strategy is also in line with the needs of the company's own development and can meet the consistency requirements of matching strategy and resources.

(3) Coordinated development strategy

The implementation of business growth strategy and scale expansion strategy are internal and external factors for enterprises to rapidly improve their market competitiveness, which are two aspects of one matter and have certain compatibility with each other. At the same time, with the support and assistance of the actual controller of Company A, Company A and related enterprises can form a strategic alliance. Company A will mainly devote itself to the improvement of internal competitiveness and the rapid growth of its business, while accelerating the formation of external expansion capabilities with the advantageous resources of the Group's common platform and strategic allies. For example, when carrying out capital operation, the company can fully rely on the help of professionals from listed companies and the strong capital operation ability within the group.

By continuously developing new products and speeding up the transformation of production capacity, Company A can improve its competitiveness, which can further enhance the investment enthusiasm of the majority of investors as reflected in various indicators such as the operating performance of the listed company and can promote the smooth implementation of refinancing in the capital market.

(4) Differentiation strategy

Determine the combination of intensive strategy and integration strategy adopted by Company A, it is necessary to plan the specific activities of the sector, such planning involves competitive strategy, in the market, from the PEST analysis of the CM industry, Company A has weak bargaining power for suppliers, especially involving some core components mainly rely on imports, the overall cost is relatively high, the implementation of low-cost strategy does not have any advantage, therefore At the present stage, it is not suitable to adopt cost leadership strategy; Company A has large capital scale and high quality of earnings, the CM industry is highly competitive, the industry pattern has basically formed, the main thing at present is to seize the

market, if the centralization strategy is adopted, it will not be able to achieve the goal of developing the market. At present, the competition in CM industry is increasingly fierce and some products are homogeneous, so only through obvious differentiation can we occupy the market. Company A can provide products, services and models that are different from competitors by virtue of its leading technological innovation, excellent manufacturing technology, perfect service network and management system, etc., so as to highlight the brand characteristics and realize the development strategy through differentiation strategy.

5. Conclusion

Since the reform and opening up, China's new CM industry development has made great strides, the overall scale and market capacity have leaped to the forefront of the world, but the overall competitiveness with developed countries, especially the CM manufacturing power still exists a large gap. In this regard, the need for CM manufacturing enterprises to technical transformation project construction, from all aspects to support, simplify procedures, accelerate the implementation of the competitive development strategy of CM products, and stabilize the vision and development plan of the CM industry clusters.

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Data Availability

Data sharing is not applicable to this article as no new data were created or analysed in this study.

Conflict of Interest

The author states that this article has no conflict of interest.

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