

Research on the Configuration Path of Digital Technology Empowering Brand Value of Publishing Enterprises

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Abstract: As a crucial intangible asset, the brand serves as a pivotal starting point for enterprises in the digital economy era to seize new opportunities and drive high-quality development. This study employs literature analysis, empirical analysis, and qualitative comparative analysis methods to conduct an empirical study on 33 listed Publishing Enterprises in Shanghai and Shenzhen stock markets, Growth Enterprise Market, Science and Technology Board, and Beijing Stock Exchange. The findings indicate that a high level of digitalization can enhance the brand value of Publishing Enterprises. Different dimensions (technology, organization, and society) all play an intermediary role in the brand value of these enterprises. The organizational scale effect enhances the role of digitalization in improving brand value. Using fsQCA analysis method reveals pathways to realize the brand value of publishing media enterprises. Based on research conclusions, this paper introduces specific countermeasures and suggestions for enhancing their brand value from three perspectives: technological innovation, organizational structure optimization, and corporate social responsibility enhancement.

Keywords: Publishing Enterprises; Digital technology; Brand value; Configuration path

1. Introduction

As a knowledge intensive enterprise, publishing media is an important component of the cultural industry, and its brand value plays a crucial role in enhancing reader appeal and market competitiveness. Many scholars have conducted research and exploration on this issue, but most studies focus on promoting long-term development of publishing and media enterprises through performance management upgrades^[1]. Zheng Yu (2020) found through empirical research that corporate brand value can create significant added value, playing a crucial role in enhancing core competitiveness and social influence^[2]. Zhang Ran and Ye Chao (2021) considered consumer awareness, reputation, and loyalty towards brands, incorporating organizational characteristics to develop a comprehensive brand value assessment scale^[3]. Liu Jianhua (2020) used data from Chinese listed companies to empirically examine the direct impact of political connections on brand value and how technological innovation mediates this relationship^[4]. They have not realized that China's listed publishing and media enterprises have gradually formed brand effects through long-term development accumulation, and can deepen research on the problem from the brand level. Based on the theories of digital economy, enterprise life cycle, and corporate social responsibility, this article takes domestic listed publishing and media enterprises as the research object, adopts the fsQCA comparative analysis method, and conducts empirical research on the synergy and integration of enterprise digitalization level with the organizational scale, social responsibility, and technological capabilities of publishing and media enterprises. It identifies the possibility and necessity of their configuration path, and provides necessary references and relevant references for how to optimize and enhance the brand value and influence of publishing and media enterprises in the next step.

2. Research methods and data sources

Zheng Jiliang and Gao Qiuting^[5] (2023) found that incorporating digital elements into the TOE framework allows for the investigation of how corporate digitalization levels and system integration

within the TOE framework can explore the coordinated combination of corporate digitalization levels, technological innovation, company size, and corporate social responsibility to enhance brand effects, i.e., examining the configurational effects of multiple factors influencing brand value in digitalization. This paper uses fsQCA (fuzzy set qualitative comparative analysis) under the TOE framework to verify whether there exist multiple concurrent causal relationships among various test conditions.

2.1 Sample selection and data sources

As of 2023, the total market value of 133 cultural and media industries in the A-share market is 1.42 trillion yuan, an increase of 16.34% compared to 2022. The total circulating market value is 1.26 trillion yuan, accounting for 88.90% of the overall circulating market value of the industry; The total market value of the media industry accounts for 2.49% of the total market value of the A-share market, and the number of enterprises accounts for 1.62% of the total number of A-share listed companies. Among them, Phoenix Media has the highest market value of 20.156 billion yuan, while Zhongnan Media and Zhejiang Edition Media rank second and third, with market values of 17.924 billion yuan and 16.444 billion yuan respectively. Shandong Publishing, Chinese Media, Xinhua Wenxuan, Anhui New Media, China Publishing, China Science and Technology Communication, and Zhongyuan Media entered the top ten, ranking 4-10 in sequence. The total market value of the top ten companies reached 129.057 billion yuan, accounting for 62.71% of the total market value of all listed companies. With the wave of digital transformation, publishing and media enterprises are generally showing a vigorous development trend, and the output value of digital publishing has repeatedly reached new highs. From the perspective of listed sectors, there are 40, 30, and 30 companies respectively listed on the Shanghai Stock Exchange Main Board, ChiNext Board, and Shenzhen Stock Exchange Main Board. The companies with the highest market value are People's Daily Online, Mango Super Media, and Focus Media. According to publicly disclosed data from listed companies, there are currently a total of 39 publishing and media companies in China, including 14 publishing companies, 2 newspaper companies, 7 distribution companies, 10 printing companies, and 6 new media companies. This article selects the 2023 annual reports of 39 listed publishing and media companies in China with publishing, distribution, news, and digital publishing as their main businesses to obtain relevant data information, and further organizes and analyzes the obtained data information.

2.2 Variable measurement and calibration

Explained variable: brand value. In the field of brand value research, the analysis method of World Brand Lab has been recognized by the academic community for publishing and media enterprises. This method systematically integrates multiple factors such as brand influence, stability, and development trajectory, providing a reliable indicator for revealing the true competitiveness of Chinese publishing and media enterprises in the market. This article selects listed media publishing and media enterprises as the main analysis objects, and performs logarithmic transformation on their brand value index, which can effectively reduce statistical errors. Given that the construction of brand value is a long-term and delayed process, the performance of brand value in the next year ($t+1$) was chosen as the measurement indicator, and the brand value of publishing and media enterprises was used as the dependent variable. When conducting regression analysis, this article takes the brand value of publishing and media enterprises as the dependent variable, and its measurement indicators are the same as those of publishing and media enterprise brand value.

Explanatory variable: digitalization level. Measuring the digitalization level of an enterprise is an indirect process, and current research methods rely on analyzing the frequency of specific digital technology terms in enterprise literature. Often, the higher the frequency, the more likely the enterprise is to value digital transformation.

The definitions and explanations of other variables are shown in Table 1.

Table 1: Definitions and descriptions of the variables

	Variable name	symbol	variable-definition
explained variable	brand value	bv	Profitability, market performance, and consumer recognition of publishing enterprise brands

explanatory variable	Digital level	digital	Keywords account for the weight of the research frequency of keywords in all publishing enterprises * 100
metavARIABLE	Technology innovation ability	tech	The ratio of enterprise R & D expenditure to enterprise operating income is * 100
	scale	size	The logarithm of the total assets at the end of the period
	Corporate Social Responsibility	csr	Earnings per share + (selling goods, provide services received cash + pay to the worker and cash for the worker + pay various taxes-received tax refund + buy goods, provide services pay cash + distribution dividends, profit or interest pay cash + donations-environmental spending) / average total equity
controlled variable	Company established years	age	Year of observation-Year of enterprise establishment
	Marketing and promotion investment	oer	The ratio of enterprise sales expenses to enterprise operating income * 100
	Enterprise growth	growth	(This year operating income-last year operating income) / last year operating income * 100
	The proportion of independent directors	indeboard	The ratio of the number of independent directors to the number of directors of an enterprise is * 100
	Corporate leverage	lev	The ratio of total assets at the end of the year to total liabilities at the end of the year * 100
	equity multiplier	stock	The ratio of total assets at the end of the year to owners equity at the end of the year * 100
	Enterprise executive management level	tat	Total asset turnover rate in business operation

3. Empirical results and analysis

3.1 Necessary condition analysis

Based on the characteristics of the case sample and drawing on different research results, determine the conditional variables and outcome variables, which belong to fixed or quantitative scale variables. At the same time, use the calibration function to convert these variables into fuzzy set scores, and then

carry out data calibration work. Based on the research results, three anchor points were selected, namely "completely non subordinate", "intersection point", and "completely subordinate", which are the quantiles of 5%, 50%, and 95% of the sample data. The anchor points and measurement indicators of these variables are understood in conjunction with the contents of the following table (see Table 2).

Table 2: Calibration anchors for each variable

variable		anchor point		
		Fully subordinate	cross point	Not subordinate at all
outcome variable	bv	25.714	24.083	22.547
The ex-dependent variable	digital	2.790	0.683	0.176
	tech	7.257	2.406	0.235
	size	26.337	23.441	21.945
	csr	75.831	18.505	4.720

After analysis (see Table 3), it was found that the consistency of all antecedent variables did not exceed 0.8, indicating that the necessity condition was not met. In other words, a single variable cannot fully explain the outcome variable, indicating that there are many influencing factors and complex influencing mechanisms on the brand value of publishing and media enterprises, and their value will be comprehensively affected by various dimensions; The brand value of Chinese publishing and media enterprises should be evaluated and judged based on the concurrent and collaborative benefits of different dimensions (organization, technology, society).

Table 3: Analysis of the necessary conditions

The ex-dependent variable	outcome variable			
	High publishing enterprise brand value		Low publishing enterprise brand value	
	consistency	coverage	consistency	coverage
High digital level	0.698	0.785	0.499	0.571
Low digital level	0.618	0.548	0.812	0.733
High-technology innovation capability	0.628	0.674	0.605	0.661
Low technology innovation ability	0.684	0.630	0.701	0.657
Large scale of enterprises	0.788	0.819	0.478	0.505
Small enterprise scale	0.524	0.497	0.829	0.799
High social responsibility	0.682	0.751	0.515	0.577
Low social responsibility	0.616	0.555	0.778	0.713

3.2 Analysis of sufficiency of conditional configuration

The empirical analysis results in the previous text indicate that the level of digital technology can significantly enhance the brand value of publishing and media enterprises. In the impact mechanism of digital technology empowering publishing and media enterprises to enhance their brand value, different dimensions of mediating effects, including corporate social responsibility and enterprise size, can effectively improve the brand effect of publishing and media enterprises. The threshold and frequency set in this section are 0.8 and 1, respectively, and different configuration paths are obtained afterwards (see Table 4), all of which can achieve the enhancement of brand value for publishing and media enterprises. The overall solution consistency is 0.837, indicating that among the cases that include these conditional configurations, 83.7% of the case companies' publishing and media enterprise brand value has been enhanced; The overall coverage of the solution is 0.778, indicating the existence of 77.8% of high publishing and media enterprise brand value construction cases, which can be explained by four types of conditional configurations. The coverage and consistency of the overall solution are all above the critical value, and the consistency indicators of the four types of conditional configuration paths all exceed 0.882 (>0.8), meeting the sufficiency condition.

Table 4: Analysis of the configuration results of the brand value of high publishing enterprises

	Digital technology is enabled		Non-digital technology-leading type	
	1	2	3	4
Digital level	•	●	⊗	⊗
Technology innovation ability	⊗	•	•	⊗
scale	•	⊗	•	•
Corporate Social Responsibility	⊗	•	⊗	•
consistency	0.906	0.908	0.881	0.882
Original coverage	0.591	0.405	0.532	0.623
Unique coverage	0.033	0.027	0.031	0.080
The consistency of the overall solutions	0.837			
The coverage of the overall solution	0.778			

Note: Referring to Ragin (2008) and other expressions, ● indicates the occurrence of the conditional variable, indicating that the conditional variable does not appear, the large circle represents the core condition, the small circle represents the edge condition, and the blank indicates that the conditional variable is irrelevant to the result. ⊗

By utilizing their own advantages and digital technology, publishing and media enterprises have also experienced brand spillover benefits. Among the four configuration paths, two paths indicate that the brand value enhancement of publishing and media enterprises benefits from digital empowerment, among which path 2 belongs to the core condition. Based on the impact of digital technology on brand building, this article categorizes configuration path types into digital empowering publishing and media enterprises and non digital technology dominant media enterprises. Research has found that digitally empowered enterprises utilize digital technology resources to varying degrees in different dimensions

such as social responsibility, technological innovation capability, and development scale, playing a positive role in enhancing the brand value of publishing and media enterprises; Non digital technology dominated enterprises, on the other hand, have not effectively enhanced the brand value of their publishing and media enterprises due to the combined effects of social responsibility, technological innovation capabilities, and enterprise development scale. This is because the impact of different configuration paths varies, either enhancing or reducing the brand value of publishing and media enterprises.

3.2.1 Empowered by digital technology

In configuration path 1, the edge and core conditions are the level of digitization and the size of the enterprise, respectively. 59% of high publishing and media enterprise brand value construction cases can be explained using this configuration path. The study found that the digital technology foundation of these case companies is relatively solid, and the improvement of digital level will result in economies of scale, thereby increasing the brand value of publishing and media enterprises. This indicates that the use of digital technology can increase the scale of enterprises and improve the brand value of publishing and media enterprises on this basis. With the expansion of business scale, publishing and media enterprises will gradually accumulate more brand value marginal benefits. After having more working capital, enterprises often choose to continue to carry out innovative research and development of digital technology, thereby improving their core competitiveness. The digital technology of this path is commonly used to improve corporate performance and can solve the problem of publishing and media companies not actively undertaking social responsibility and having a low level of technological innovation in brand building in the short term.

In configuration path 2, the edge and core conditions are technological innovation capability, corporate social responsibility, and digitalization level, respectively. This configuration path can be used to explain the brand value construction cases of 40% higher publishing and media enterprises. Research has found that the digital technology within this path first manifests as technological advantages, with the case enterprise possessing advanced digital technology and more core competitive advantages, providing strong technical support for enterprise development and brand building. At the same time, in the social dimension, digital technology transformation will stimulate the sense of social responsibility of enterprises. In order to continue to consolidate their positive image, publishing and media enterprises often continue to improve product quality and management level, providing consumers with high added value and high-quality products. This path indicates that digital technology can enable businesses to actively take on social responsibility and support brand building.

3.2.2 Non digital technology dominant type

In configuration path 3, the edge and core conditions are technological innovation capability and enterprise scale, respectively. Within this path, publishing and media enterprises can obtain sufficient funds for brand building after expanding their business and production scale, and carry out technological innovation and research and development activities to further enhance brand value, resulting in brand premiums; The synergistic effect of organization and technology can compensate for the lag in the impact of technological innovation capability on the brand value enhancement process of publishing and media enterprises. Digital technology has not played a leading role and its empowerment effect in the social dimension is poor. Publishing and media enterprises have not actively fulfilled their social responsibilities. 53% of high publishing and media enterprise brand value construction cases can be explained using this configuration path.

In configuration path 4, the edge and core conditions are corporate social responsibility and corporate scale, respectively. In the process of enhancing the brand value of publishing and media enterprises within this path, digital technology has not played a leading role, mainly because some case companies did not effectively utilize digital technology when building their brands, but instead increased brand value through social responsibility and economies of scale in the social and organizational dimensions. To a certain extent, this can meet the demands of different stakeholders and enhance enterprise value. If the empowerment effect of digital technology in different dimensions (technology, organization, society) is poor, simply expanding the scale of enterprises cannot fully support the brand value enhancement work of publishing and media enterprises.

3.2.3 Analysis of Overlapping Paths and Substitution Relationships

Analyzing and studying the substitution and overlapping paths of different paths, and comparing and analyzing the two paths of comprehensive collaboration, it is found that actively assuming social responsibility, expanding enterprise scale, and improving technological innovation capabilities can all

play a positive and beneficial role in enhancing the brand value of publishing and media enterprises; The improvement of digital level and the synergy of different conditional variables (technology, organization, society) can achieve the enhancement of brand value for publishing and media enterprises.

Firstly, the overlapping paths of configurations 1 and 2 are digital technologies, and different conditional variables (technology, organization, society) have substitution effects. In the process of brand building, the use of digital technology can empower corporate social responsibility and technological research and development dimensions, mainly to expand the scale of enterprise operations and achieve economies of scale.

Secondly, the overlapping paths of configurations 1, 3, and 4 are based on the size of the enterprise, with edge conditions including corporate social responsibility, high digitalization level, and technological innovation capability, which can be replaced by each other in pairs.

Thirdly, the scale of business development of enterprises is relatively large, able to grasp high-quality resources, focus on developing a certain dimension (technology, organization, society) and empower it, which helps accelerate the construction of brands.

4. Conclusion and Implications

Digital transformation is essentially a profound change in management mode, and this process is irreversible. For publishing and media enterprises, digital transformation involves a long time span, a wide range of content, arduous tasks, and significant pressure. It is necessary to deeply analyze potential problems and respond to various difficulties and challenges with firm determination. This article combines the background of the digital era and takes listed publishing and media companies in China as the research object. Using the configuration analysis method, it explores and analyzes the factors that enhance the brand value of media enterprises at the current stage, and proposes the internal connection and influence mechanism between the brand value and digital level of publishing and media enterprises in China. The following research conclusions are drawn:

Firstly, the dimensions of technological innovation, enterprise development scale, and social responsibility under the TOE framework have a significant mediating effect on the digitalization of publishing and media enterprises, where a higher level of digitalization can increase the brand value of publishing and media enterprises. Secondly, in the mechanism by which the level of digitization affects brand value, different dimensions (technology, organization, society) all play a mediating role. Among them, technological innovation, due to its long time, large resource investment, inability to generate profits in a short period of time, and high risk, has a significantly greater negative impact than a positive impact. In other words, technological innovation capability will reduce the digital enhancement of publishing and media enterprise brand value. Within the digital empowerment of brand value, corporate social responsibility and enterprise scale both play a driving and supporting role; Thirdly, economies of scale will enhance the digitalization level of publishing and media enterprises and enhance their brand value. Digital technology can enable different stakeholders to maintain good communication and exchange relationships, thereby increasing brand value and visibility; Fourthly, the digital development of publishing and media enterprises can be coordinated with dimensions such as environment and organization to enhance their brand value. When enterprises have a high level of digitalization, they should actively assume social responsibility, expand their scale, and enhance their technological innovation capabilities; When a company has limited resources, it can enhance its brand value by replacing marginal conditions such as corporate social responsibility, high digitalization level, and technological innovation capability with each other.

High quality development is the evolution process of enterprises towards higher forms, and its core development logic lies in quality change, efficiency change, and power change^[5]. As the main market entities for the high-quality development of the cultural publishing industry, listed publishing and media companies need to strengthen structural reforms from the supply side to achieve quality improvement through technological innovation. Based on the analysis of the configuration path of digital technology empowering the brand value of Chinese publishing and media enterprises, the conclusion of this article also has the following policy implications:

Firstly, it is to adhere to innovation and accelerate the integration and development of digital technology in publishing and media enterprises.

The second is to build a brand and form a brand image with market appeal. In the digital age,

publishing and media enterprises can use digital technology to communicate and collaborate more efficiently, achieve resource sharing and mutual benefit in enterprise brand image dissemination and customer relationship maintenance.

Thirdly, we should leverage our advantages and continue to practice corporate social responsibility. Publishing and media enterprises have abundant content resources, including books, journals, newspapers and other publications, as well as digital content such as e-books and online articles.

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