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Impact of SRDI Enterprise Process Digitization on Customer Structure

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Abstract: Under the macro background of the construction of digital China, the ability of business process digitization to empower "Specialized, Refined, Distinctive, and Innovative"（SRDI）enterprises to adjust their customer structure has become the focus of academic attention. Based on the data of A-share national and provincial SRDI listed companies from 2011 to 2022, this paper empirically examines the relationship between business process digitization and customer structure, and the role of the mechanism in it. It is found that process digitization of SRDI enterprises reduces the degree of concentration of customer structure. It is further found that process digitization reduces customer concentration through two paths: improving the technological innovation ability and enhancing the market position of enterprises. The study not only reveals the impact mechanism of process digitization on customer structure, enriches the research on process digitization and supply chain management of SRDI enterprises, but also provides theoretical references for small and medium-sized enterprises (SMEs) to rationally adjust their customer structure.

Keywords: Digitalization of Business Processes; SRDI; Customer Concentration; Technological Innovation; Market Position

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1.Introduction

The digital economy, centered on data as a key factor, is emerging as a vital engine driving high-quality development. Corporate digital transformation involves deeply integrating digital technologies across the entire business chain to build a data-driven value creation system, enabling adaptation to technological innovation and fostering competitiveness. The "14th Five-Year Plan for Digital Economy Development" emphasizes the systematic advancement of digital restructuring in enterprise business processes. It encourages leading enterprises to build intelligent platforms to break down data silos, enhance collaboration, and elevate operational and decision-making capabilities. As trailblazers among small and medium-sized enterprises, the high-quality development of "Specialized, Refined, Distinctive, and Innovative"(SRDI) enterprises has become a crucial practical focus.

Customer concentration, as a core metric in supply chain relationships, exhibits a double-edged sword effect in its economic implications. Strategic partnerships can reduce transaction costs, generate synergies, and foster long-term value creation[1]. However, excessive concentration leads to an imbalance in bargaining power, forcing enterprises to accept unfavorable terms that squeeze profit margins and heighten operational risks[2]. Given this risk exposure, the China Securities Regulatory Commission (CSRC) has mandated disclosure of the top five customer share since 2014 and instituted specialized IPO inquiries. This underscores the urgency of balancing customer relationship management efficiency with risk prevention, while

also providing a practical basis for research.

This study examines the impact of enterprise process digitization on customer structure and its underlying mechanisms, using SRDI enterprises listed on China's A-share market from 2011 to 2022 as research samples. Theoretically, it enriches the existing research on the influence of enterprise process digitization on customer structure and provides a theoretical basis for supply chain enterprises to rationally adjust their customer structure in business operations.

2.Literature Review and Research Hypotheses

2.1 Literature Review

Process digitization refers to the systematic engineering of enterprises employing digital technologies to profoundly restructure core business processes[3]. Existing literature indicates that process digitization not only significantly enhances corporate management efficiency and market competitiveness but also serves as a vital driver for innovation and development[4]. By optimizing resource allocation, reducing manual intervention, and increasing information transparency, enterprises can respond more efficiently to customer demands while effectively lowering costs. Particularly in supply chain management and customer relationship maintenance, the application of digital tools enables more precise demand forecasting and real-time operational monitoring[5].

With the deep application of digital technologies, traditional linear supply chain structures have undergone deconstruction and reorganization. Their networked and dynamic characteristics have driven exponential growth in corporate customer acquisition channels, expanding customer coverage beyond geographical and industry boundaries [6]. In this evolutionary process, customer concentration—as a core metric reflecting customer structure distribution—has drawn sustained academic attention due to its dynamic evolution patterns and economic implications. Existing literature primarily explores the transmission mechanisms linking customer concentration to corporate performance and capital market outcomes, yet no theoretical consensus has emerged. Some studies indicate that increased customer concentration exacerbates the decline in supplier bargaining power, leading to a significant rise in equity financing costs [7]. Conversely, other research confirms that a moderately concentrated customer structure can reduce transaction costs through economies of scale, exerting a significant positive incentive on corporate operational efficiency [8]. Notably, existing research predominantly focuses on analyzing the impact effects of customer concentration, with insufficient attention paid to the shaping effect of strategic transformations like enterprise process digitization on customer concentration itself.

2.2 Research Hypotheses

2.2.1 Digitalization of Processes and Customer Structure for SRDI Enterprises

The essence of a company's excessive reliance on major clients lies in a structural dilemma stemming from a lack of core competitiveness and inefficient resource allocation [9]. Under resource constraints, weak bargaining power forces companies to accept asymmetric terms imposed by major clients, resulting in persistent compression of profit margins. Simultaneously, a monolithic customer structure intensifies the lock-in effect of investments in specialized assets, triggering systemic operational risks when major clients depart. Process digitization, however, empowers value chain operations by integrating digital technologies. On one hand, enterprises leverage digital tools to enable real-time collection and dynamic matching of supply chain data, thereby constructing resilient supply chain networks that enhance responsiveness in niche markets and broaden customer bases to reduce reliance on any single client[10]. On the other hand, smart manufacturing replaces traditional labor to generate economies of scale, lowering unit production costs. Alternatively, digital technologies reduce transactional uncertainty and decision-making trial-and-error costs, forming a portfolio advantage. This composite cost restructuring enables enterprises to transcend geographical and industry boundaries to acquire incremental customer segments. Based on this, this paper proposes:

H1: Process digitalization in SRDI enterprises reduces customer concentration.

2.2.2 The Mediating Role of Technological Innovation in Enterprises

The deep digitalization of core business processes significantly enhances the timeliness, completeness, and analyzability of data elements, thereby providing dual support for technological innovation activities [11]. First, enterprises integrate internal and external data through digital technologies to establish precise demand identification mechanisms, effectively capturing

latent needs and emerging trends in fragmented markets [12]. Second, leveraging digital technologies compresses new product R&D cycles and reduces the marginal costs of customized production, thereby enhancing corporate technological innovation capabilities.

Enhanced technological innovation capabilities have driven a fundamental shift in corporate customer structures, with the continuous introduction of new customer segments significantly reducing customer concentration. Enterprises leverage digital technologies to develop differentiated market solutions, breaking through limitations imposed by traditional core customer bases. Through data-driven precision marketing and personalized customer relationship management systems, they efficiently penetrate new geographic regions and cross-industry markets, building diversified customer portfolios.Based on the above analysis, we propose the following hypothesis:

H2: SRDI enterprise process digitization reduces customer concentration by enhancing technological innovation capabilities.

2.2.3 The Mediating Role of Corporate Market Position

A company's market position, as a key indicator measuring its relative strength and overall competitiveness, holds significant strategic importance for its survival and development. It typically manifests as brand influence, customer recognition, and economies of scale advantages[13].

Enterprise process digitization enhances market positioning by restructuring and empowering operational systems, thereby driving diversification in corporate client structures. From a value chain perspective, digital technologies systematically compress internal operational response times and reduce transaction costs through automated processing, data interconnectivity, and intelligent algorithms. Process reengineering across procurement, production, logistics, and customer service eliminates redundant non-value-added activities, elevates operational efficiency and system reliability, and significantly enhances the precision and agility with which enterprises respond to market dynamics and customer demands. According to the resource-based view, the data assets and intelligent systems accumulated during digital transformation constitute difficult-to-imitate heterogeneous strategic resources[14]. These support enterprises in establishing sustainable competitive advantages in critical areas such as product innovation, agile decision-making, and risk management, driving market share expansion and strengthening market position. Enhanced market standing further amplifies economies of scale, propelling customer diversification.Based on the above analysis, the following hypothesis is proposed:

H3: SRDI enterprise process digitization reduces customer concentration by elevating the enterprise's market position.

3.Research Design

3.1 Sample Selection and Data Sources

This study selected SRDI enterprises listed on China's A-share market from 2011 to 2022 as the research sample. The list of SRDI enterprises was sourced from the CSMAR database. Based on this, the list of SRDI enterprises among A-share listed companies was matched according to the first six batches of national and provincial-level SRDI enterprises published by the Ministry of Industry and Information Technology. To avoid data interference, the following treatments were applied: First, samples from the financial and insurance sectors were excluded; Second, samples classified as ST or *ST were excluded. Third, samples with missing primary variables were discarded. To mitigate the impact of outliers, all continuous variables underwent trimmed processing at the upper and lower 1% levels, yielding a final sample size of 8,269 observations. Patent data for this study was sourced from the CNRDS database, while all other data originated from the CSMAR database.

3.2 Variable Definition

Customer Concentration (Cus): Measured by the ratio of sales to the top five customers to total annual sales.

Business Process Digitization (DT): Following the methodology of Wu Fei (2021) et al., this study measures DT using the total frequency of relevant keywords in company annual reports [15]. Specifically, the frequency data for process innovation terms in the CSMAR database is adjusted by adding 1 and taking the logarithm to assess business process digitization.

Patent Innovation (Pat): Measured by taking the logarithm of the sum of patent applications for invention patents, design patents, and utility model patents, plus one.

Market Position of Enterprises (PCM): Following Peress (2010), the Lerner Index is employed to measure an enterprise's market position. The calculation formula is: PCM = (Operating Revenue - Operating Costs - Selling Expenses -

Administrative Expenses) / Operating Revenue [16].

The control variables selected for this study include: Firm Age (Age), defined as the natural logarithm of the observed year minus the founding year plus one; Return on Assets (ROA), calculated as net profit divided by total assets; Board Size (Board), defined as the natural logarithm of the total number of board members plus one; Dual Role (Dua1), valued as 1 if the chairman and general manager are the same person, otherwise 0; Ownership Type (Soe), valued as 1 for state-owned enterprises, otherwise 0; Debt-to-Asset Ratio (Lev), calculated as total liabilities divided by total assets; Net Cash Flow (Cash), calculated as net cash flow from operating activities divided by total assets.

3.3 Model Setup

To empirically examine the impact of SRDI enterprise process digitization on customer structure, this paper constructs the following benchmark regression model:

$$Cus_{i,t} = \alpha_0 + \alpha_1 DT_{i,t} + \alpha_2 Control_{i,t} + Year_t + Industry_{i,t} + \delta_{i,t} \quad (1)$$

Among these, Cus represents customer concentration; DT denotes enterprise process digitization indicators; $Control$ signifies a set of control variables; and δ represents the random error of the model. Additionally, this paper controls for industry (Industry) and year (Year) effects.

To further examine the mediating role of technological innovation capabilities and market position in the impact of process digitization on customer structure, mediation effect models (2) and (3) were constructed based on model (1):

$$Med_{i,t} = \beta_0 + \beta_1 DT_{i,t} + \beta_3 Control_{i,t} + Year_t + Industry_{i,t} + \delta_{i,t} \quad (2)$$

$$Cus_{i,t} = \gamma_0 + \gamma_1 DT + \gamma 2 Med_{i,t} + \gamma_3 Control_{i,t} + Year_t + Industry_{i,t} + \delta_{i,t} \quad (3)$$

Among these, Med represents the mediating variables, encompassing technological innovation capability (Pat) and firm market position (PCM).

4.Empirical Analysis

4.1 Descriptive Statistics

Descriptive statistics for key variables are presented in Table 1. The mean customer concentration ratio stands at 36.249%, with a minimum of 4.49% and a maximum of 95.69%, and a median of 31.16%. This indicates that a high proportion of sales attributable to major clients is a common phenomenon among SRDI enterprises. The mean and standard deviation for business process digitization were 1.544 and 1.475, respectively, with minimum and maximum values of 0 and 5.278. This indicates that the level of business process digitization among SRDI enterprises is uneven and varies significantly.

Table 1 Descriptive Statistics

Variable	Observation	Mean	Standard Deviation	Min	Max	Med
Cus	8269	36.249	21.629	4.490	95.690	31.160
DT	8269	1.544	1.475	0.000	5.278	1.099
PCM	8269	0.165	0.131	-0.236	0.553	0.152
Pat	8269	2.024	1.282	0.000	4.828	2.079
Lev	8269	0.310	0.174	0.039	0.793	0.283
Board	8269	2.183	0.161	1.792	2.485	2.303
Soe	8269	0.115	0.319	0.000	1.000	0.000
Dua1	8269	0.418	0.493	0.000	1.000	0.000
Age	8269	2.855	0.313	1.946	3.497	2.890
ROA	8269	0.044	0.063	-0.245	0.198	0.048
Cash	8269	0.043	0.064	-0.146	0.218	0.044

4.2 Baseline Regression Analysis

Table 2 presents the benchmark regression results for the impact of SRDI enterprise process digitization on corporate custom-

er concentration. Column (1) includes only the core explanatory variable, enterprise process digitization (DT); Column (2) incorporates industry and year fixed effects; Column (3) further includes control variables alongside year and industry fixed effects. The results indicate that enterprise process digitization significantly reduces corporate customer concentration and promotes the diversification of corporate customer relationships. Hypothesis H1 is thus confirmed.

Table 2 Baseline Regression Analysis

Variable	**(1)** **Cus**	**(2)** **Cus**	**(3)** **Cus**
DT	-0.440***	-2.066***	-2.155***
	(0.159)	(0.189)	(0.186)
Constant	36.928***	14.128***	44.780***
	(0.342)	(1.833)	(4.426)
Control	No	No	Yes
Industry	No	Yes	Yes
Year	No	Yes	Yes
N	8269	8269	8269
R^2	0.001	0.125	0.153

4.3 Robustness Test

To verify the robustness of the research findings, this paper replaced the dependent variable with the customer concentration Herfindahl Index (ccHHI), calculated as the sum of the squares of the ratios of the top five customers' sales to total sales, and reran the regression. The test results are shown in Column (1) of Table 3. DT regression coefficient is significantly negative at the 1% level, indicating that the core conclusion holds robustly.

Considering that the impact of SRDI enterprise process digitization on customer concentration may exhibit a certain degree of lag, this paper regresses the core explanatory variable DT and the control variable lagged by one period again in Model (1). The results are shown in Column (2) of Table 3. The regression coefficient of L.DT is significantly negative at the 1% level, indicating that the core conclusion remains robust.

Table 3 Robustness Test

Variable	**(1)** **ccHHI**	**(2)** **Cus**
DT	-0.525***	
	(0.080)	
L.DT		-2.132***
		(0.199)
Constant	10.681***	40.818***
	(1.850)	(4.763)
Control	Yes	Yes
Industry	Yes	Yes
Year	Yes	Yes
N	8269	6701
R^2	0.082	0.150

4.4 Mechanism Verification

Table 4 columns (1) and (3) report the test results for Model (2). The findings indicate that digital transformation of business processes not only enhances technological innovation capabilities but also elevates market position. Columns (2) and (4) present the verification results for Model (3). Combined with the regression results in Column (3) of Model (1), it can be determined that the mediating effect between technological innovation capability (Pat) and market position (PCM) holds, exhibiting partial mediation. Specifically, SRDI enterprise process digitization promotes diversified customer relationship development by enhancing technological innovation capability and elevating market position. Hypotheses H2 and H3 are thus validated.

Table 4 Mechanism Verification

Variable	(1) Pat	(2) Cus	(3) PCM	(4) Cus
DT	0.138***	-2.076***	0.004***	-2.037***
	(0.011)	(0.188)	(0.001)	(0.186)
Pat		-0.577***		
		(0.194)		
PCM				-28.216***
				(2.892)
Constant	1.062***	45.393***	0.108***	41.731***
	(0.289)	(4.422)	(0.021)	(4.417)
Control	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
N	8269	8269	8269	8269
R^2	0.149	0.154	0.541	0.167

5.Conclusion

This study examines the impact of enterprise process digitization on corporate customer structure, using national and provincial SRDI enterprises listed on China's A-share market from 2011 to 2022 as research samples. It further investigates the mediating effect of technological innovation capacity and market position between these two factors. The findings reveal that process digitalization among SRDI enterprises reduces customer concentration and promotes diversification in customer relationships. Mechanism tests indicate that process digitalization lowers customer concentration by enhancing technological innovation capabilities and elevating market position.

Based on the above conclusions, this paper proposes the following recommendations: First, government departments must strengthen the coordinated development of digital infrastructure and data governance systems to provide institutional safeguards for the value conversion of technological innovation. Second, given the significant differences in process foundations and transformation capabilities across industries and enterprise sizes, local governments and industry organizations should offer differentiated enabling services to address both common and unique challenges in the implementation of enterprise process digitization. Third, specialized, refined, distinctive, and innovative enterprises must deeply embed themselves within industrial ecosystem networks. They should establish a trinity-based collaborative mechanism integrating "technology-data-supply chain" to consolidate market positions and enhance bargaining power, thereby reducing dependence on major clients.

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Conflict of Interests

The authors declare that there is no conflict of interest regarding the publication of this paper.

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