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Causes and solutions to financing difficulties of SMEs from the perspective of digital transformation: a new perspective on data credit

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Abstract. For a long time, information asymmetry and insufficient collateral have been regarded as the primary crux of financing difficulties for Small and Medium-sized Enterprises (SMEs). In the advent of the digital economy, a new type of "credit barrier" is emerging. This paper, drawing on field investigations and case observations, explores how SMEs can overcome this barrier through leveraging digital transformation. We propose that many SMEs are falling into a state of "data poverty"—they do not lack business performance, but cannot convert their operational efforts into "data credit" that financial institutions can identify and trust. The study highlights that the strategic significance of digital transformation extends beyond cost reduction and efficiency improvement; it is directly related to the reconstruction of enterprises' financing capacity. To address this, we propose a trinity-based solution encompassing proactive development by enterprises, collaborative innovation by financial institutions, and ecological cultivation by the government. This approach aims to provide a clear path for SMEs to convert "data" into "credit assets". Our findings indicate that digital transformation is not just a choice for SMEs but a necessity for their survival and growth in the digital age. By embracing digitalization, SMEs can fundamentally overcome financing difficulties and secure sustainable growth within the digital economy.

Keywords: SME financing, digital transformation, data credit, data poverty, credit assetization

1. Introduction

As the "capillaries" of the national economy, the vitality and robust health of SMEs are crucial, but "financing difficulties" remain an insurmountable bottleneck. The traditional analytical paradigm either criticizes the "financing discrimination" of financial institutions or attributes such difficulties to the "innate deficiencies" of enterprises themselves. Today, as the digital economy has evolved into a core national strategy, we urgently need to break away from this dualistic narrative. This paper seeks to establish a new perspective: the financing problem is, to some extent, the "digital aphasia" of enterprises themselves in the digital realm [1]. We will delve into how SMEs can learn to articulate their value propositions clearly to the financial market in the "language of data" through the digitalization of internal management digitalization, thereby converting intangible operational capabilities into tangible financial credibility.

2. Literature review: the perspective shift from "external blood transfusion" to "internal blood production"

The academic community has conducted in-depth analyses of the financing difficulties faced by SMEs, with a general focus on three traditional constraints: first, the deep-rooted information asymmetry, which leaves financial institutions like "looking at flowers in the fog" [2]; second, the rigid constraint of collateral, which poses challenges for light-asset enterprises [3]; third, the fragility of internal governance structures, which undermines the long-term confidence of external stakeholders [4].

At the same time, research on digital transformation is gaining momentum, but most studies focus on examining how technology reshapes business models and operational processes [5]. A thought-provoking observation is that when discussing the integration of digitalization and financing, the academic focus shifts to "Financial Technology (FinTech)"—that is, how financial institutions leverage big data, blockchain and other technologies to innovate risk control models (such as supply chain finance,

and online credit) [6]. These studies are undoubtedly of great value, but they are essentially rooted in the logic of "external blood transfusion".

This paper seeks to highlight an overlooked research gap: while applauding for the advent of "FinTech", have we neglected the "digital preparedness" of the financing subject—SMEs themselves [7]? If enterprises cannot generate standardized and credible data streams, then even the most advanced FinTech platforms will face the dilemma of "having no rice to cook". Therefore, the core focus of this paper is to investigate how SMEs can proactively bridge the credit gap with the capital market through "internal blood production"—namely, enhancing their digital management capabilities [8].

3. Re-exploring the causes: credit sinking in the digital divide

Under the impact of the digital wave, the financing difficulties faced by SMEs exhibit a complex interplay of longstanding and emerging obstacles.

3.1. The digital amplification of traditional obstacles

The longstanding issue of information asymmetry has not dissipated with technological advancement, but may even be exacerbated [2]. When the risk control systems of financial institutions have entered the "algorithm era", the information disclosure practices still remain in the "manual accounting era". The information generation gap between these two parties has not narrowed, but is widening at an accelerated pace. The issue of insufficient collateral is affected; in the absence of data credit as a supplement, this rigid constraint becomes even more pronounced [3].

3.2. The lack of "data credit": a new bottleneck in the new environment

This is currently the most pressing challenge. Our observations indicate that many SMEs are not short of business operations, but their operational activities cannot be effectively converted into credible credit evidence [9]. This is specifically reflected in three dimensions:

Data "Desertification": A substantial volume of core business data (such as daily orders, customer repurchase rates, and real-time inventory) remains scattered in employees' WeChat chat records, paper documents or isolated Excel files, failing to be aggregated into continuous and structured "data assets". Without data accumulation, it is like having no "credit file" in the digital realm [10].

Data in a "Mute" State: Even if some enterprises possess data, they lack the ability to "express" such data effectively. They are unable to use modern data tools (such as Power BI, and Tableau) to transform key indicators into intuitive dynamic charts [11]. Imagine, which is more persuasive to a credit manager—a static table of figures or a "data cockpit" that visually presents sales trends and cash flow health?

Encountering "Digital Interface" Discrimination: The risk control models of financial institutions are growing increasingly sophisticated, and their "appetite for data" is expanding. However, the internal management systems of SMEs are often outdated and fragmented in nature, and thus unable to realize secure and standardized API integration with the digital systems of financial institutions [12]. This mismatch in "digital interfaces" has led to many viable enterprises being automatically screened out by risk control models, forming a significant "digital exclusion".

4. Solutions: building a multi-dimensional collaborative "new data credit ecosystem"

To address this systemic challenge, enterprises, financial institutions and the government need to break free from their inherent roles and collaboratively develop a new ecosystem that fosters "data credit".

4.1. To SMEs: the strategic transformation from "financing seekers" to "credit demonstrators"

SMEs must acknowledge that in the digital economy, data management capability is synonymous with credit access capability [8].

Strategic "Cloud Adoption and Data Utilization": There is no need to deploy expensive and complex ERP systems in one step. By starting with the most critical business links, lightweight SaaS tools tailored for small and micro enterprises, such as Kingdee Cloud·Star and UFIDA Changjie, can be adopted to prioritize the realization of business onlineization, thus ensuring that every step of operation leaves a "data footprint" [13].

Creating "Speaking" Reports: Entrepreneurs need to master the capability of narrating business value through data. For example, before applying for a loan, they can fully use the above tools to automatically generate the sales revenue curve of the

past year and the accounts receivable ageing analysis chart, making business advantages clear at a glance. Data-driven visual credit is far more powerful than pale self-description [11].

Proactively Shaping "Digital Identity": Actively use third-party platforms like "Zhima Enterprise Credit" to integrate the enterprise's public credit records including tax, social security, water and electricity, so as to form a three-dimensional and verifiable digital credit profile, breaking down information silos [14].

4.2. To financial institutions: the model innovation from "report auditors" to "data interpreters"

Financial institutions must recognize that to serve future customers, they must upgrade their current risk control paradigms [6].

Developing "Multi-dimensional Perspective" Risk Control Models: It is imperative to go beyond the traditional "three financial statements". A modern risk control model should be able to integrate alternative data such as the enterprise's tax records, customs export data, evaluations from core supply chain enterprises, and even metrics such as online store ratings and customer service response speed [15]. Alibaba's MYbank, which provides unsecured loans by analyzing transaction data on e-commerce platforms, is a successful practice [16].

Building "API Direct Connection" Intelligent Financing Channels: By developing standardized API interfaces and connecting with mainstream SaaS service platforms, financial institutions can realize automatic data acquisition and risk assessment upon obtaining authorization from enterprises. This enables the embedding of financing services into the enterprise's operational scenarios thereby achieving "drip irrigation" precise credit support [12].

4.3. To governments and universities: the role upgrade from "policy providers" to "ecological architects"

Implementing "Inclusive Cloud Adoption" Subsidy Programs: Local governments can establish special subsidy funds to offer subsidies to SMEs purchasing certified cloud services software at a certain percentage, lowering the initial threshold for their digital transformation [17].

Constructing "Regional Enterprise Data Service Centers": Drawing on the successful experience of Zhejiang's "Financial Comprehensive Service Platform", under the premise of "data security" and "authorized use", the government should take the lead in integrating data from market supervision, taxation, social security and other departments to form an authoritative public data product for financial institutions, thereby enhancing the creditworthiness of SMEs [18].

Launching "Entrepreneur Digital Literacy" Improvement Programs: Universities and industry associations should collaborate to develop "short, flat and fast" practical training courses. The courses should avoid abstract theoretical content and instead focus on practical skills such as "how to manage a company with data" and "how to use visualization tools to add points to loan applications", thereby helping entrepreneurs become competent "helmsmen" in the digital era [19].

5. Conclusion

The analysis in this paper demonstrates that the essence of the financing difficulties of SMEs has undergone a profound evolution in the digital era. Traditional solutions are like "cardiotonics", which offer temporary relief but fail to address the root cause. The development of "data credit" is the "fundamental solution" to open up the financing blood vessels. It is crucial to recognize that digital transformation is no longer a choice of "whether to" for SMEs, but a survival imperative related to their "existence or demise". It determines whether enterprises can obtain the most basic "financial discourse power" in the future economic landscape. Looking forward, with the maturity of artificial intelligence and blockchain technologies, data-based credit evaluation will become more dynamic and precise. However, no matter how technology evolves, its foundation always lies in whether enterprises themselves can systematically generate credible and usable data. This path is not without its challenges, and challenges such as data security, privacy protection, and technological ethics will invariably arise. But the direction of this transformation is clear: only by actively embracing digitalization and transforming themselves into transparent and trustworthy data generators can SMEs fundamentally get rid of financing difficulties and navigate steadily in the broader landscape of the digital economy.

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