

How to Warranty the Sustainability of a Company's Digital Transformation Base on the Case of Chi Forest

Nan SU*

Beijing Normal University-Hong Kong Baptist University United International College (UIC),
Zhuhai, China

*Corresponding author, s230006174@mail.uic.edu.cn

Meiling YU

Beijing Normal University-Hong Kong Baptist University United International College (UIC),
Zhuhai, China

s230024260@mail.uic.edu.cn

Abstract. *As earnings decrease and deflation occurs, companies are facing more competition. Digital transformation has emerged as a crucial strategy for companies to pursue new avenues of growth. Existing studies have explored the definition of digital transformation, the relationship between digital transformation and sustainability, and the impact of digital strategies on businesses. The study aims to investigate the drivers and processes of digital transformation towards sustainability and introduces a qualitative approach of single case study to explain the mechanisms involved. So how did we realize the research in this study? Firstly, we selected Chi Forest, a prominent beverage company, as our research subject. We then adopt an interpretivist research methodology to examine the steps behind the sustainable phenomenon of digital transformation at Chi Forest as well as the driving factors. This provides key recommendations for companies that when undergoing digital transformation, it is important to give more consideration to the steps of transformation and improve the sustainability of the transformation results. The highlight of this study is that we extend the existing steps of digital transformation by describing different transformation processes. More importantly, our study offers a comprehensive and a multi-perspective research reflection the literature on the application of digital transformation strategies, adding value to the existing research.*

Keywords: Digital transformation, Sustainability, Case study, Driving forces, Transformation processes, Dynamic capability

Introduction

Digital transformation refers to the increasing use of digital technology in the direction of company operations, product design and frameworks. This means that companies are able to use digital transformation to cope with increased competition in various industries in the face of declining profits and a poor economic environment. In addition, the use of digital transformation can increase the efficiency of the company's operations, enabling the company to improve its production and sales.

Existing studies have explored the definition of digital transformation, the relationship between digital transformation and sustainability, and the impact of digital strategies on businesses. These studies identify the foundations of 'strategy implementation', 'digital transformation (George et al., 2021)' and 'sustainability (Guandalini, 2022)', providing an adequate theoretical basis for strategic transformation planning in business.

With the above analysis of the research context, we conclude that the contribution of this paper is in two aspects.

DOI: 10.2478/picbe-2024-0288

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- This paper closely integrates interpretivist research methods and case data to enhance the readability and logic of the theoretical approach.
- Through qualitative analysis, we infer the drivers and steps for sustainable digital transformation.

Based on the above background, the rest of the paper is organized as follows. The second section of the paper focuses on the literature review, which synthesizes the dynamic capability theory and related studies with digital transformation sustainability. The third section is the research methodology, which analyzes how Chi Forest applies interpretivist research methods in qualitative research. The fourth section is a case study, which specifically analyzes the drivers and processes that make digital transformation sustainable and successful at Chi Forest. The fifth section is a discussion of the impact of that driver and process and is the conclusion of this paper. The sixth section consists of our analysis and reflection of the constraints encountered throughout this study and future research.

Introduction contains all the necessary ideas to introduce the reader in the topic of the paper and the research performed by the author. It shows the importance of the subject and the approach used by the author in dealing with it. It is necessary for the author to formulate clearly the research question and the main hypotheses considered in this research.

Literature review

We conduct research around the sustainability of digital transformation in this study to examine how companies can reach sustainable goals. Using a combination of qualitative research and real-world case studies, we propose a model about the processes and drivers in digital transformation of enterprises. We base our case study on a theoretical framework, i.e., applying the dynamic capabilities theory as well as focusing on the relationship between digital transformation and sustainability, to study the transformation process and the impact of the process on the sustainability of digital transformation in enterprises. Our literature review will be conducted from two perspectives: a theoretical perspective on the development of dynamic capabilities theory and a practical perspective on research related to digital transformation applications in enterprises.

Dynamic capability theory

Research on dynamic capabilities theory has been a significant part of the business management literature in recent years. In the past literature on dynamic capabilities theory, research has been categorized into two main perspectives: the internal and external impacts of dynamic capabilities. We focus that effective transformation needs to be based on the assistance of high dynamic capabilities.

The internal study of dynamic capabilities has been developed by a rich body of research. Teece(2007) proposes that dynamic capabilities theory examines how firms integrate, build, and reorganize internal and external resources and capabilities to generate a new capability that adapts to rapidly changing environments and facilitates the maintenance and creation of sustainable competitive advantage. Ettlie and Pavlou(2006) summarized that the dynamic capabilities theory encompasses a firm's perceived capabilities, learning capabilities, integration capabilities and coordination capabilities. Among them, high learning capability can learn new knowledge faster and improve the completion of strategy implementation; high integration capability means that in one action, digital transformation, departments can be reorganized more systematically and effectively.

In addition, the external effects of dynamic capabilities theory have been elucidated by research, Macher and Mowery(2009) explaining that high dynamic capabilities can feed back into the fact that firms will perceive specific competitive environments and thus develop clear strategic plans. Thus, we can conclude that in the existing research shows that firms with high dynamic capabilities will have more business advantages than firms with weak dynamic capabilities. Meanwhile, the theory describes how firms can create advantages in the competitive environment. The ability of the dynamic theory determines whether a firm can sustainably have a competitive advantage.

The relationship between digital transformation and sustainability

As we organize the literature on dynamic capabilities theory, we pay particular attention to the state of research on digital transformation and sustainability in business management studies.

In 1987, the United Nations Brundtland Commission established a definition of "sustainable development" as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs", a definition that has gained the widest acceptance among scholars, practitioners and policymakers. Geroge et al. (2021) suggest that the shift to digitalization is inevitable in this increasingly competitive environment. Businesses and governments in society are competing to realize their full potential. Paiola et al.(2021)consider the impact of digital servitization on the sustainability of the Italian manufacturing industry, and the study proves that the technology application perspective has had a positive impact on the sustainability of digitization. Šimberová et al.(2022) conducted a collective study of digital transformation cases in European SMEs and provided quantitative criteria, the results of which helped these SMEs to improve the sustainability of their business.

However, Ardito et al.(2021), after a series of studies, suggests that it has not yet been possible to prove that there is a positive relationship between digital transformation and the sustainability of business development. Therefore, Andriushchenko et al.(2022)argue that future research should explicitly discuss digital transformation development as a business strategy that has the potential to be sustainable in the future.

Methodology

Method selection

Our research question was to explore how digital transformation can lead to sustainable development. We adopted a qualitative research methodology, which is a perspective that examines social phenomena and things. a single-case inductive study is more suitable for the extraction of laws and theoretical induction behind a specific phenomenon (Gioia et al., 2013). As an emerging phenomenon in recent years, the reasons behind the sustainability of enterprise digital transformation in practice are not fully understood. The qualitative research methodology enables this study to focus on analyzing the multiple factors.

Existing research has focused on the factors that contribute to the success and failure of digital transformation (Gurbaxani & Dunkle, 2019), but has yet to discuss the drivers of how digital transformation is sustained over time. Individual case studies are particularly suited to situations that require in-depth understanding and exploration of the research context and analysis of real-world complexities, thus facilitating in-depth analysis of the case itself (Donmoyer, 2000). This case design approach allows this study to analyze in depth the factors influencing the sustainability of digital transformation within the context of the same firm, thus making it easier to draw empirical conclusions.

Case selection and description

This research focuses on Chi Forest, a beverage industry company that was founded only 5 years ago but has achieved a profit growth rate several times faster than other companies in the same industry, driven by digital transformation. It follows the importance principle and focus principle of theoretical sampling. As a research object, it is mainly based on the following considerations.

On the one hand, from a digital transformation standpoint, Chi Forest has implemented a comprehensive digital program design and digital application across various aspects of its operations, including sales, production, supply chain, and financial accounting. This aligns with the focus of our research on digital transformation. On the other hand, the enterprise digital transformation presents a sustainable state. While the traditional beverage industry continues to fall into the red sea of competition, Chi Forest is able to carve out market share from companies such as Coke and Sprite, which precisely relies on applying digital transformation to the entire company's industrial chain. The fact that Chi Forest's turnover is still growing despite the fact that the epidemic and the economic downturn have hit the retail industry hard in the past two years suggests that Chi Forest's digital transformation has been a relatively successful attempt. Hence, it is appropriate to use Chi Forest Company as a sustainable research object.

Data collection

The main data source of this investigation is secondary data. This study focuses on secondary data research; collecting data from 3 aspects to enhance the credibility and validity of the case; collecting data in real time, backtracking the data in many aspects, covering the whole process of digital transformation of Chi Forest Company, and using multiple channels to collect data. There are three main types of data:

- Secondary interview data, video recordings of interviews with the company's senior leaders and leaders of relevant departments collected through the Internet, and textual information collated and analyzed.
- Internal corporate information, mainly including corporate website information, archive information (corporate videos, PPTs), annual report announcements, and social responsibility report information.

Data analysis

Data analysis in this investigation followed an inductive thematic analysis methodology. Specifically, the data analysis in this study adhered to the data analysis method proposed by Gioia et al. (2013), in which raw data are coded and then theoretical explanations are ultimately abstracted. Method of inductive thematic analysis refers to the induction of theoretical themes. Gehman et al. (2018) recognize the coding method proposed by Gioia et al. as a specific strategy for rigorously undertaking inductive thematic analysis. After that, these events and activities were coded (Lamont & Molnár, 2002), and every effort was made to place ourselves in the shoes of the interviewees. The interviewees provided the names for the first-order constructs (Gioia et al., 2013).

The first-order concepts were then decoded and aggregated into second-order themes. The first-order concepts from the three strides with digital and sustainability characteristics were compiled into abstracted and theorized second-level themes. In order to assure the objectivity of the coding, the authors iterated the first-level concepts and second-level themes based on the falsifiability principle during the coding process, ultimately forming the second-level themes. Finally, the motifs at the second level are compiled to form the summary concepts. This step

identifies and resolves the logical connections behind the coding, based on secondary themes and theories of strategy implementation and dynamic capabilities. Consequently, this study incorporates coding into the aggregated concepts of "digitalization" and "sustainability."

Results and discussions

This is a unique pathway for achieving sustainable digital transformation

The data results of this paper are presented in an aggregated conceptual tree diagram. It reflects the digitization process as an initiative taken by Chi Forest and sustainability as a result of digitization on Chi Forest's transformation. The core business drivers and market pressures act as internal and external drivers, respectively, to push the company to build a bridge between digitization and sustainability.

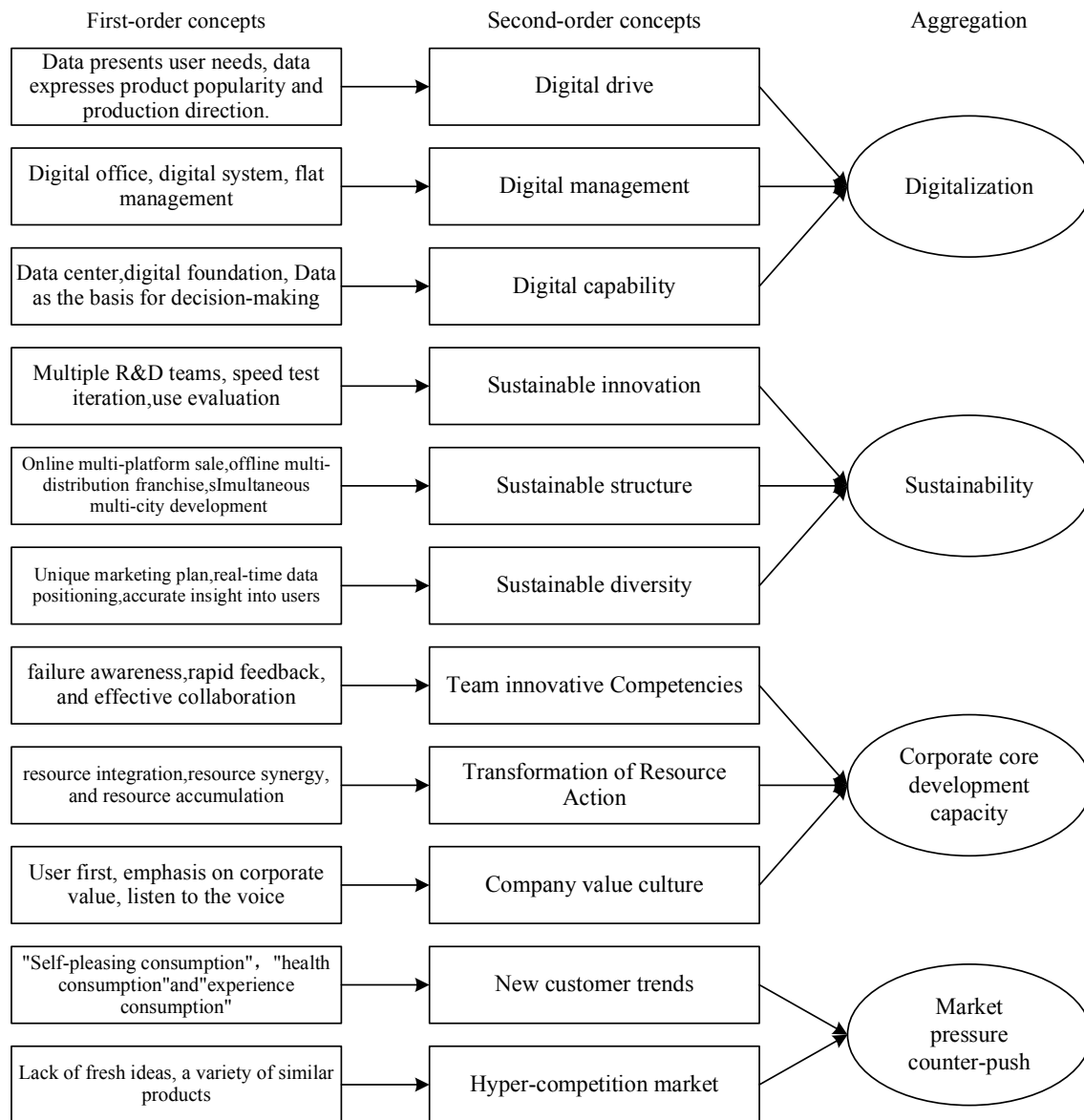


Figure 1. Aggregate idea maps in case analysis

Source: Authors' own research.

Internal Drivers: Core Enterprise Development Capabilities

Core Enterprise Development Competencies are Chi Forest's internal drivers and are critical to the sustainability of the digital transformation. Chi Forest case material contains three intrinsic factors: the ability of the team to innovate, the transformation of resources, and the culture of the corporate.

Team Innovation Capability: Team innovation capability is the core strength of a company's team, and the Chi Forest team's ability to innovate can be summed up as "Recognizing Failure, Giving Rapid Feedback, and Collaborating Effectively." *As an illustration, each new Chi Forest beverage undergoes thousands of taste tests, with an average of one to two flavor tests per week, in which the R&D team quickly recognizes the failure of a new product if the feedback from the taste test is negative and withdraws the program to avoid additional losses., if the feedback from a taste test is negative, the R&D team quickly recognizes the failure of the new product and withdraws the plan to avoid incurring additional losses. As a result, Chi Forest reduces the time to three to six months compared to the one- to two-year R&D cycle of traditional companies.* Efficient collaboration between R&D and digital technology departments enables swift collection of user input and efficient communication of novel solutions. Therefore, the ability to innovate as a team is an important part of a company's core competencies.

Resource Conversion: In terms of resource conversion, Chi Forest follows a resource conversion strategy that involves integrating, synergizing, and accumulating resources. Chi Forest integrates internal resources, pays for R&D and production resources regardless of the cost, and chooses the industry's high standards and costs to increase the value of the product itself.

As of September 2021, Chi Forest's R&D expenses reportedly increased 350% year-on-year, the highest R&D expenses among beverage companies of the same size. Similarly, resource synergies are an important step in the transformation of Chi Forest's overall resource program. Chi Forest has partnered with the Institute of Microbiology of the Chinese Academy of Sciences (CAS), Jiangnan University, Beijing Sport University, and the General Hospital of the People's Army of China (P.A.A.C.A.) to provide scientific and theoretical guidance for product development.

Chi Forest also prioritizes the process of resource accumulation. Throughout the previous year, Chi Forest has released many region-specific limited products. While Chi Forest may not be able to meet the demands of all users in different regions simultaneously, accumulating resources is the process of expanding their sales territory and user base. They have introduced a variety of beverage flavors to meet the preferences of customers in each region. *For example, Chi Forest launched a lychee-flavored soda in Northeast China to cater to the region's preference for lychees. The product was a huge success in the region.*

Corporate Culture: In terms of corporate culture, Chi Forest adheres to the value of "customers first" and pursues user reputation and product experience. Chi Forest's mission is "Challenge the impossible, change the world with good products", and its vision is "Chi Forest of the world, integrating global resources and profoundly influencing 2 billion people". Chi Forest is the first company in the retail industry to utilize digital technology to better serve users and accurately capture user needs and social hotspots through data. With the three major concepts of "Refuse High Sugar, Refuse High Calorie, and Refuse Fat Increase", Chi Forest focuses on the packaging of its products while rapidly meeting the high-quality requirements of the new generation of consumers.

External drivers of market pressure

The market, as an external driver of an organization's digital transformation, is a key factor in achieving a sustainable digital transformation. In the case of the Chi Forest market, the external forces can be summarized as two aspects of new consumer trends in a competitive marketplace.

New Consumer Trends: "Self-indulgent consumption, healthy consumption, and experiential consumption are three major trends in the current consumer market. These trends in the external environment provide insights for Chi Forest's product development.

"Self-indulgent consumption" is a consumer trend that refers to consumer behavior to satisfy their own needs and interests. This type of consumer behavior emphasizes the need for personalization, self-fulfillment, and self-improvement, rather than simply satisfying the basic needs of life. *Chi Forest, for example, uses data to keep a constant focus on its consumers and designs new products to satisfy consumers' desire for "self-indulgent consumption".*

Healthy consumption refers to the fact that consumers pay more attention to the health, environmental protection, safety and other characteristics of products, as well as the protection and enhancement of their own health when purchasing goods or services. For example, organic food, health care products, etc. *So, Chi Forest pays attention to the younger generation's demand for health in its product design by reducing sugar content and emphasizing quality testing.*

Finally, experience-based consumption refers to the fact that consumers pay more attention to the experience, feelings and emotions of the product, as well as the improvement of their own quality of life when purchasing goods or services. This consumption trend has gradually emerged in recent years, mainly due to people's increasing demand for quality of life, as well as the pursuit of a personalized, diversified and free lifestyle. *Chi Forest encourages users to participate in product innovation activities, such as online testing functions, to meet consumer demand for "experience-based consumption".*

Competitive Market: According to 2021 data, the soft drink market in China has become increasingly competitive over the past decade, but has stabilized at 40.7% CR8 and 28.2% CR4 over the past two to three years. Other beverage manufacturers, such as Coca-Cola and Pepsi, are competitors of Chi Forest. To cope with the competitive market, Chi Forest focuses on R&D and iterative product improvement to find niche markets.

Evolutionary stages of digital transformation feasibility

The digital transformation process at Chi Forest has produced sustainable results. Since the implementation of digital technologies, we have divided the company's development into three stages: the first stage focuses on utilizing digital innovations to promote sustainability, the second stage involves establishing a sustainable digital management system, and the third stage is complete digitization to diversify sustainability.

Phase 1: Digital Innovation for Sustainability. The initial stage of Chi Forest's development was data-driven to achieve sustainable innovation. *Early on, Chi Forest employed a range of data collecting instruments to derive inspiration for novel beverage product advancements from the gathered data.* Based on this, Chi Forest was able to better capture consumer opinions and needs, which allowed it to propose new directions and accelerate product iterations. Through the interlocking processes of multiple R&D teams, a rapid testing system, and massive user reviews, Chi Forest has built on this foundation to realize the first phase of sustainable innovation.

Phase 2: Digital management to develop a sustainable structure. Chi Forest is a fast-growing retail beverage company whose digital management strategy and growth trajectory can serve as a model for newcomers and the industry as a whole. Chi Forest's digital management consists of

three components: digital office, digital systems, and flat management. *Chi Forest's digital office includes data-driven testing, digital operations, and more. Since 2018, Chi Forest has been a paperless office, including the development of management tools for production, approvals, and report generation. At Chi Forest, business approvals can be completed in less than three hours, compared to days and multiple levels in the traditional approach.* Chi Forest is a digital system that utilizes data for decision-making, sharing and reusing back-end support functions, and is a flexible and versatile front-end business platform. As a Chi Forest employee, he can effectively perform the necessary digital system duties. The digital system is a dynamic system that allows for simultaneous observation of the company's operations over multiple time periods. Chi Forest's flat management refers to a management model implemented within an organization that facilitates more direct communication between departments and employees. Chi Forest has achieved flat management through the use of digital management tools, which has significantly increased productivity. Chi Forest has more than 300 product developers, and its development team has remained quite large throughout its existence. size. Every day, they research and design many product concepts. *For example, the product incubation team holds weekly "new product selection meetings" where everyone must present their latest ideas for product categories and flavors.*

Phase 3: Digital capabilities for diversified and sustainable development. Real-time data targeting and precise insights into human nature under a unique marketing program. *Beverage company Chi Forest has established an all-link data center and an all-operations database in the process of digitally-driven, digitally-managed, and ultimately all-digital capabilities. This refers to the penetration of upstream and downstream data, utilizing various systems or tools to collect data from the whole chain, and then precipitating it into its own data lake for alignment, to achieve complete data collection for the whole operation chain.* The complete data provides a reliable guarantee for Chi Forest's decision-making.

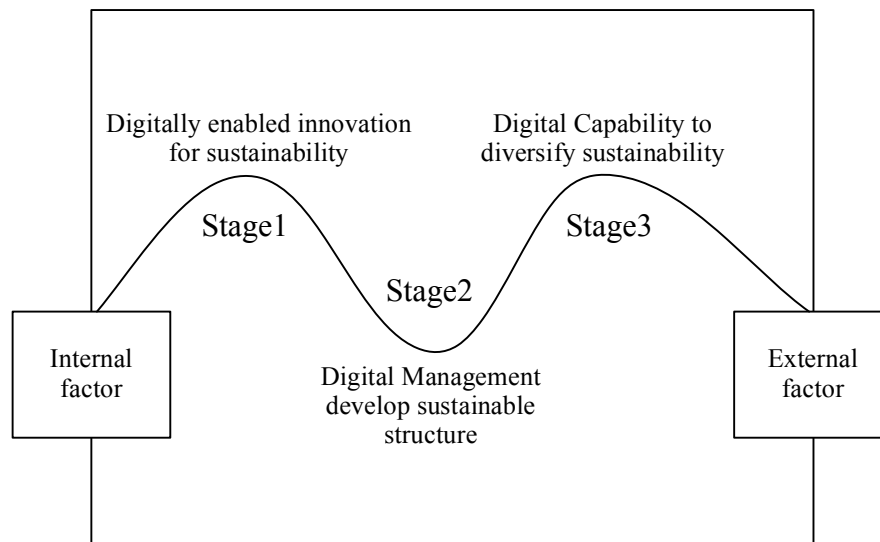


Figure 2. Divers and stage in transformation

Source: Authors' own research.

Conclusion

Discussion for case study

This paper focuses on Chi Forest, a company founded in 2015 and entered the market in 2018. Based on this case study, the paper further explores the evolution of the sustainability of digital transformation and its internal and external drivers, shedding light on the current state of affairs at various stages of digital development.

From the perspective of internal and external drivers, the sustainability of a company's digital behavior stems from the company's basic capabilities and market pressure. Due to market pressure from external influences, digital transformation will become more efficient and evolve from part to whole. Supported by the core competencies within the company, The company's digital transformation process is expedited with the help of its core strengths, advancing sustainable development and helping it to meet its sustainability objectives.

From the perspective of process evolution, the digital transformation process of the company has experienced three leaps from digital drive, digital management to digital core. These stages illustrate the company's progression in adopting digital technology, implementing digital systems, and ultimately establishing a digital core. This layered relationship facilitates the effective implementation and alignment of the company's overall strategy. In the different stages of the digital leap, sustainability experiences effective growth from innovation and process to diversification. The degree of sustainability in the previous phase also lays the foundation for a deeper level of sustainability in the next phase.

Contribution

First, existing studies summarize firm capabilities based on dynamic capabilities theory (Teece, 2007), but there are few studies in which dynamic capabilities theory is applied to digital transformation. This study analyzes the impact of digital transformation from the perspective of dynamic capabilities and concludes that for digital transformation to be sustainable, it is necessary to enhance the firm's dynamic capabilities. It also considers that the perspective of digital transformation from the dynamic capabilities theory is incomplete. This study complements the impact of internal and external factors on the sustainability of digital transformation and encourages firms to think more holistically when choosing digital transformation.

Second, existing research on digital transformation and sustainability focuses on the relationship between them, such as understanding the goals of digitalization from a sustainability-related perspective (Guandalini, 2022). However, there is still very little research on digital transformation from a sustainability perspective, and therefore there is a need to investigate how digital transformation can be used to achieve sustainability. Therefore, this study divides the transformation process into three phases: digitally driven innovation for sustainability, digital management for sustainability structures, and digital core development for sustainability diversification.

The study of the theory brings effective suggestions for the actual practice of digital transformation in companies. On the one hand, business managers should first should carefully consider internal and external factors. Companies need to analyze the overall digital trends in the external market environment and then plan their development from a data-driven perspective. Similarly, internal factors are critical to the success of digital transformation. Only a team with the ability to innovate and transform resources can realize the success of digital transformation based on the company's core values. An effective transformation program must be designed for the

specific context of the organization. On the other hand, Understand the sequential nature of digital transformation. Enterprises should focus on the practice of each step from the steps of digital transformation.

Limitation

This study uses a large amount of data from Chi Forest for in-depth analysis, but it does not represent a common path for digital transformation across enterprises. The digital transformation of businesses is a widespread trend in modern development, and the degree of digital transformation should be evaluated within the specific context of each company. Chi Forest, the selected company for this research, serves as a notable illustration of effective digital transformation, in contrast to the majority of companies that struggle with this process. Future research could enhance the path of digital transformation by examining in more depth the issues that arose during the digital transformation process of the failed company.

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