

# The Evolution of Dynamic Environmental Management Thought and Its Application in Business Ecosystems

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**Received:** 28 June 2026; **Accepted:** 18 July 2026; **Published:** 9 August 2026

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## Abstract:

This paper is about the logical development of management thought, mechanistic theory to systematic view, and extensively discusses the use of the systematic view-business ecosystem perspective in enterprise management against the backdrop of new-quality productive forces. To begin with, it tabulates the history of the scientific background and methodology of management thought, and examines the fundamental features and management practices of mechanistic theory and systematic view. It then looks at the difficulties and prospects that new-quality productive forces pose on management thought and underlines the significance of the systematic view. Moreover, it expounds the theoretical connotation and structural attributes of the business ecosystem viewpoint, highlighting its strategic implementation in the four phases of a dynamic environment: pioneering, expansion, leadership, and self-renewal. This paper integrates theory and practice to offer enterprises detailed theoretical backing and practical advice to survive in the complex business environment and enables them to attain sustainable development in dynamic environments.

## Keywords:

Management Thought, Mechanistic Theory, Systematic View, Business Ecosystem Perspective, New-quality Productive Forces

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## 1. Introduction

In the era of rapid globalization and digitalization, the business environment is highly dynamic and complex. Enterprises face many challenges such as accelerated technological innovation, volatile market demand, and increasingly fierce competition. As the theoretical cornerstone guiding enterprise operation and development, management thought is also evolving continuously to adapt to changes of the times. The shift from early mechanistic management thought to modern systematic view reflects the deepening understanding of the nature of enterprise management.

New-quality productive forces, driven by scientific and technological innovation, feature digitization, intelligence, and networking. Their emergence has not only changed production and business models but also raised new requirements for management thought. As a type of systematic view, the business ecosystem perspective emphasizes interaction and collaboration between enterprises and the external environment, focusing on the positioning and role of enterprises in the

business ecosystem. It has become an important management concept for enterprises to maintain sustainable competitive advantages in a dynamic environment. This paper aims to provide useful references for enterprise management practice under the background of new-quality productive forces by deeply discussing the evolution of management thought and the application of the business ecosystem perspective.

## **2. Literature Review**

### ***2.1. Management Theory Research on New-Quality Productive Forces***

Xiao Hongjun et al. (2023) first proposed the “three-highs” characteristics of new-quality productive forces (high technology, high efficiency, high quality), pointing out that it forces the management paradigm to transform from mechanical control to ecological collaboration through the restructuring of data factors[1]. Chen Jiagui et al. (2019) confirmed this view from the perspective of a century of management evolution, arguing that standardized management in the industrial revolution can no longer meet the needs of technological generational changes[2]. Cai Li et al. (2020) further revealed the challenges of digital technology to innovation management theory, emphasizing that the traditional KPI system has the risk of incentive failure in a dynamic environment and urgently needs a value network-based evaluation mechanism[5].

### ***2.2. Localized Development of Business Ecosystem Theory***

Moore’s (1993) four-stage model of business ecosystems shows distinctive characteristics in the Chinese context. Based on the Huawei case, Wang Jiexiang et al. (2021) found that Chinese enterprises’ “platform + ecosystem” strategy needs to supplement a policy-driven dimension, with the government as a key support system directly affecting ecosystem health[4]. Li Haijian et al. (2022) pointed out that in the digital economy era, ecological boundaries have jumped from a “chain structure” (traditional supply chain) to a “network structure” (such as Xiaomi’s IoT platform), with value creation showing multi-directional symbiosis[3]. Jiang Jihai et al. (2021) called for building an integrated analytical framework covering “structure–capability–evolution” through a systematic review of domestic and foreign literature[7].

### ***2.3. Enterprise Niche Construction Practice in Dynamic Environments***

Regarding how enterprises grow sustainably in business ecosystems, Zhang Yuli et al. (2020) proposed that start-ups need to achieve differentiated survival through niche focusing[8]. Xu Hui et al. (2021) further verified the key role of dynamic capabilities (such as resource bricolage, relationship reconstruction) in niche leapfrogging. Taking Haier’s transformation as an example, Ouyang Taohua et al. (2022) revealed that enterprises in the IoT era need to attract complementors to join the ecosystem through architectural openness (such as API interface sharing)[9][10]. Chen Jin et al.’s (2020) integrated innovation theory emphasized that industry–university–research collaboration is the core path to break “innovation islands”[6].

## **3. Evolution of the Scientific Background and Methodology of Management Thought**

### ***3.1. Mechanistic Management Thought***

### ***3.1.1. Scientific Background***

Mechanistic management thought emerged from the late 19th century to the early 20th century, during the booming Industrial Revolution when the factory system was gradually established. The Industrial Revolution brought a huge leap in productivity but also triggered a series of management problems such as low labor efficiency and sharp labor-capital conflicts. Taylor's scientific management theory came into being against this background. Its scientific background mainly stems from the development of physics and engineering. At that time, people regarded nature as a huge machine with clear causal relationships between parts, which could achieve optimal operation through precise calculation and control. Taylor introduced this mechanistic way of thinking into enterprise management, attempting to treat the enterprise as a machine-like system. Through careful observation and experimentation of workers' labor processes, he formulated scientific working methods and standards to improve labor productivity.

### ***3.1.2. Methodological Characteristics***

Mechanistic management thinking focuses on the standardization, formalization and supremacy of efficiency. Taylor suggested a scientific quota system: he measured the standard time needed to perform a task with the help of time and motion studies, and determined an appropriate amount of work per day. The standardization principle entailed the need to set standard operating procedures, regulations and rules, and employ standardized machines, tools and materials to bring about consistency and stability in the production process. The differential piece-rate system provided economic incentives to workers to work hard and enhance efficiency. Taylor promoted in organizational management the separation of planning and execution, the creation of specialized departments of management with their own managers, and the functional foreman system. This approach breaks down the enterprise into separate chains with definite tasks and duties, which optimizes the overall effectiveness by accurate calculation and control.

### ***3.1.3. Reflection in Management Practice***

Early management of factories used mechanistic management extensively. Indicatively, Ford Motor Company embraced the assembly line whereby car manufacturing was divided into a sequence of standardized operations. Workers were only in charge of one link and parts were delivered to each station through a conveyor belt achieving mass production of cars. This technique significantly enhanced efficiency, lowered costs and made cars affordable, facilitating their popularization. Nevertheless, there were apparent weaknesses of mechanist management: it did not consider human factors, workers were regarded as machine appendages, it only emphasized on task accomplishment without considering the needs and emotions of workers, which resulted in acute labor-capital conflicts and low initiative. Moreover, it was too focused on standardization and formalization, inflexible and non-innovative, which made it hard to change according to the market demands.

## ***3.2. Systematic View of Management Thought***

### ***3.2.1. Scientific Background***

The systematic view emerged in the mid-20th century. With the development of systems theory, cybernetics, and information theory, people began to recognize that

enterprises are complex systems where parts are interrelated and interactive, not simple mechanical combinations. During this period, the research scope of management expanded from a single production process to the entire enterprise operation, emphasizing interaction and collaboration between enterprises and the external environment. The emergence of new-quality productive forces (such as information technology) enabled enterprises to acquire and process information more conveniently, further promoting the systematic view. Enterprises could use information systems to grasp market demand and competitor dynamics in real time, adjusting strategies accordingly.

### ***3.2.2. Methodological Characteristics***

The systematic perspective focuses on integrity, dynamics and synergy. It considers the enterprise as an open system that interacts with the outside environment in terms of materials, energy, and information. It is concerned with understanding the operation of enterprises as a whole in management approaches, streamlining internal factors and external relations to attain sustainable development. As an illustration, strategic management theory presupposes that enterprises need to develop strategies based on the changes occurring externally by evaluating political, economic, social, and technological aspects, and choosing suitable strategies depending on their resources and capabilities. Organizational behavior is concerned with the behavior and psychology of employees, enhancing initiative and creativity by motivating and communicating. To unlock the potential of employees, enterprises should develop a good corporate culture.

### ***3.2.3. Reflection in Management Practice***

The systematic perspective is popular in contemporary management of enterprises. Indicatively, most businesses have embraced the matrix structure of organization whereby the conventional departmental walls are eliminated and cross-departmental cooperation enhanced. Under a matrix structure, employees are part of a functional department as well as a project team, and they make the best use of professional knowledge to enhance efficiency in execution. In the meantime, companies pay more attention to the interaction with external partners (suppliers, customers, partners), and obtain the sharing of resources and complementary benefits via strategic alliances. Using Apple as an example, it does not only concentrate on R&D and production but also forms close alliances with international suppliers and partners. Apple has stringent supplier standards of quality production and innovation capacity, and collaborates with operators and software developers to market products and services, creating a massive business ecosystem.

## **4. Challenges and Opportunities of New-Quality Productive Forces for Management Thought**

### ***4.1. Characteristics of New-Quality Productive Forces***

New-quality productive forces are driven by scientific and technological innovation, featuring digitization, intelligence, and networking. Digitization enables data collection, storage, analysis, and application in production, management, and sales, improving operational efficiency and management levels. For example, big data analysis helps enterprises understand consumer preferences and develop market-oriented products. Intelligence makes production more automated and intelligent,

reducing manual intervention and improving quality and efficiency (e.g., industrial robots for 24-hour production). Networking enables real-time connection and collaboration with suppliers, customers, and partners, breaking time and space constraints (e.g., IoT for remote equipment monitoring).

## ***4.2. Challenges to Management Thought***

### ***4.2.1. Increased Uncertainty in Dynamic Environments***

The development of new-quality productive forces has made the market more complex and volatile, bringing greater uncertainty to enterprises. Rapid technological iteration and changing consumer demand make it difficult for enterprises to accurately predict trends and formulate long-term stable strategies. For example, Nokia, once dominant in the mobile phone market, failed to keep up with the smartphone trend and was eliminated. In the smartphone era, consumers demanded touchscreens, high-definition cameras, and powerful processors, but Nokia insisted on traditional keyboard designs and failed to launch competitive products, leading to declining market share.

### ***4.2.2. Prominent Limitations of Traditional Management Models***

Traditional mechanistic management, emphasizing standardization and formalization, struggles to adapt to the dynamic environment of new-quality productive forces. Enterprises now need to focus more on innovation and flexibility, encouraging employees' creativity and initiative. However, traditional models overemphasize control and restraint, limiting development and innovation space. For example, some enterprises adopt strict attendance and performance appraisal systems, requiring employees to work on schedule and follow fixed procedures. Although ensuring order, this inhibits innovative thinking and initiative.

## ***4.3. Opportunities for Management Thought***

### ***4.3.1. Promoting Innovation in Management Thought***

The development of new-quality productive forces provides an opportunity for management innovation. The systematic view, emphasizing interaction and collaboration between enterprises and the external environment, better adapts to the dynamic context. For example, the business ecosystem perspective, as a systematic view, focuses on enterprise positioning in the ecosystem and achieves common development through cooperation and competition. Enterprises can establish strategic alliances with suppliers, customers, and partners for joint R&D, production, and sales, realizing resource sharing and complementary advantages. They can also influence the ecosystem direction and enhance competitiveness by participating in industry standard-setting and technological alliances.

### ***4.3.2. Accelerating Enterprise Digital Transformation***

New-quality productive forces drive enterprises to speed up digital transformation. Digital technology enables real-time information sharing and collaborative work, improving management efficiency and decision-making science. For example, enterprises can build digital management platforms to monitor production, sales, and logistics in real time, solving problems promptly. Meanwhile, big data and artificial

intelligence support forecasting market trends and customer needs, providing decision support.

## **5. Theoretical Connotation and Structural Characteristics of the Business Ecosystem Perspective**

### ***5.1. Theoretical Connotation***

Derived from ecosystem theory, the business ecosystem perspective regards enterprises as members of a business ecosystem. A business ecosystem is an economic community composed of organizations and individuals, including core enterprises, consumers, market intermediaries, suppliers, risk takers, and to some extent competitors. These members form value chains, which interweave into value networks through which materials, energy, and information flow and circulate. The perspective emphasizes interdependence and co-evolution among members, achieving common development through cooperation and competition. Enterprises cannot exist in isolation; they must build good partnerships to cope with market challenges and achieve win-win results.

### ***5.2. Structural Characteristics***

#### ***5.2.1. Core Ecosystem***

The core ecosystem includes direct suppliers, manufacturers, sales channels, and direct customers. Close collaboration among these members is the foundation for stable ecosystem operation. For example, Apple has long-term stable partnerships with suppliers and sales channels, imposing strict requirements for high-quality production and innovation. It cooperates with major operators and retailers to ensure smooth distribution. Direct customers are the ultimate beneficiaries, whose demand and feedback guide ecosystem development.

#### ***5.2.2. Support System***

The support system includes investors, government departments, universities, research institutions, and associations representing consumers and suppliers. These members provide capital, technology, talent, and policy support, promoting ecosystem development and innovation. For example, investors fund production expansion and R&D; governments issue preferential tax and subsidy policies; universities and research institutions support technology development and talent training; associations protect legitimate rights and interests.

#### ***5.2.3. Competitive System***

The competitive system includes direct and potential competitors. Competition is an important driving force, pushing enterprises to improve competitiveness and promote ecosystem evolution. For example, competition among Apple, Samsung, and Huawei in the mobile phone market drives continuous product and technological innovation, upgrading the entire industry. Competition covers price, quality, function, brand image, market share, and customer service. Enterprises must innovate to remain competitive.

## **6. Strategic Application of the Business Ecosystem Perspective in Dynamic Environments**

### ***6.1. Pioneering the Ecosystem Stage***

#### ***6.1.1. Value Creation***

In the pioneering stage, core enterprises collaborate with customers and suppliers to discover and exploit new valuable paradigms in a more effective manner. As an illustration, Tesla was the first company to introduce electric vehicles, which offer environmentally friendly and convenient transportation due to innovative battery and self-driving technologies. It is user experience oriented, establishing a supercharger network and providing remote software updates to enhance satisfaction and loyalty. Tesla also collaborates with suppliers to come up with key components, which fosters industrial development (e. g., partnering with Panasonic to manufacture batteries, streamlining processes and lowering costs to increase range and cost-performance).

#### ***6.1.2. Technology Investment and Product Improvement***

Companies invest in capability development to develop more effective customer value. Tesla is constantly investing in R&D, enhancing the performance and range of EVs, making breakthroughs in batteries, motors, and autonomous driving, and introducing new products. It also enhances products according to consumer feedback, releasing models like Model 3 and Model Y to address various needs.

### ***6.2. Expanding the Ecosystem Stage***

#### ***6.2.1. Formation of Core Groups***

During the expansion phase, key customers, suppliers and channels are tightly integrated with core enterprises, enhancing supply and product diversity with partners to attain maximum market penetration and create core groups, which make competitor challenges very expensive. Indicatively, Alibaba has developed Taobao and Tmall, which have attracted many merchants and consumers to create a massive ecosystem. It collaborated with suppliers and logistics firms to enhance efficiency in supply and delivery to satisfy consumer demand. To increase market share, it introduced promotions (e. g., Double 11) and services (e. g., Alipay) to attract more users and merchants.

#### ***6.2.2. Market Coverage and Competitive Barriers***

Companies grow market share, gain market share and erect barriers. Alibaba has diversified into finance, cloud computing, and logistics to strengthen its dominant position. As an example, Ant Group offers Alipay and Yu' E Bao; Alibaba Cloud provides cloud services to decrease the cost of IT and enhance efficiency. Diversified business design increases competitiveness and resistance to risk. Brand building and technological innovation enhances customer loyalty, which makes it hard to penetrate the market by competitors.

### ***6.3. Leading the Ecosystem Stage***

#### ***6.3.1. Contribution to Overall Development***

During the leadership phase, individuals and organizations should play their part in developing the overall ecosystem to retain power. Indicatively, Apple is a market leader in the smartphone and tablet industry due to its innovative products and services. It pays attention to hardware design, software, and services (iOS, App Store) and offers an integrated user experience. Apple is actively engaged in the development of ecosystems, collaborating with developers, offering tools to increase the prosperity of apps, organizing conferences as a means of communication and innovation.

### ***6.3.2. Authority Establishment and System Maintenance***

Companies build influence through their contribution to the ecosystem, stability and growth. Apple guarantees quality and user experience with quality control and branding, gaining trust. It rigorously manages design and manufacturing processes. It works closely with suppliers to overcome market challenges and keep the ecosystem healthy (e.g., working together to set quality standards and production specifications for components to ensure quality and supply stability).

## ***6.4. Self-Renewal or Decline Stage***

### ***6.4.1. Responding to Environmental Changes***

Ecosystems face various tests during evolution; enterprises must respond to environmental changes and renew themselves. For example, as the smartphone market matures, Apple increased investment in smart home and wearable devices to expand business and find new growth points. It launched HomePod and Apple Watch, reducing dependence on a single market and improving risk resistance.

### ***6.4.2. Innovation and Transformation***

Enterprises achieve self-renewal through innovation and transformation. Apple continuously launches new products and technologies (wireless headsets, smart watches) to meet changing consumer demand. It strengthens software and service development (Apple Music, iCloud) to improve user stickiness and loyalty. Through innovation and transformation, Apple maintains market leadership and achieves sustainable development.

## **7. Conclusions**

The logical evolution of management thought from mechanistic theory to systematic view is an inevitable result of adapting to the times. The emergence of new-quality productive forces brings new challenges and opportunities. As a systematic view, the business ecosystem perspective has become an important concept for enterprises to maintain sustainable competitive advantages in dynamic environments. Through strategic application in the pioneering, expansion, leadership, and self-renewal stages, enterprises can position themselves in the ecosystem, collaborate with other members, and achieve common development.

Taking Xiaomi as an example, it has fully applied the strategic thinking of the business ecosystem perspective in construction and development: starting with cost-effective products in the pioneering stage, expanding into multiple fields in the expansion stage, strengthening brand building and technological innovation in the

leadership stage, and maintaining continuous R&D investment in the self-renewal stage. Xiaomi has continuously adapted to market changes and achieved rapid growth.

In the future business landscape, companies need to truly put systems thinking into practice, not just pay lip service to it. To keep pace with new-quality productive forces, they must continuously drive innovation and change—relying on old playbooks simply won't cut it anymore. Actively building and nurturing business ecosystems, while fostering deep, trust-based relationships with suppliers, customers, and partners, is essential. Resources need to flow freely, and complementary strengths must be leveraged so that businesses can stay grounded amid constant shifts. Companies must stay keenly attuned to market dynamics and technological trends. They need both the agility to adjust strategies quickly and the discipline to renew themselves from within—not waiting to be phased out, but proactively reinventing themselves. Of course, businesses can't do it all on their own. Governments and society at large need to step up with tangible support and guidance for the business ecosystem—through better policies, infrastructure, and services—so that sustainable development moves from aspiration to reality.

## Conflicts of Interest

The author declares that there is no conflict of interest regarding the publication of this article.

## Funding

This research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors.

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