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Evolutionary Path and Mechanisms of Value Co-creation by Focal Firms in Digital Innovation Ecosystems: Evidence from Anjoy Foods

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Abstract— *In the era of the digital economy, digital innovation ecosystems have become a critical vehicle for the digital transformation and upgrading of traditional industries. Understanding how focal firms drive value co-creation across different stages of ecosystem development is of both theoretical and practical importance. Using Anjoy Foods, a leading enterprise in China's frozen food industry, as a longitudinal case, this study investigates the evolutionary path and underlying mechanisms of value co-creation from the perspective of the digital innovation ecosystem by adopting a motivation–process–outcome analytical framework. The evolution of Anjoy Foods' value co-creation practices from 2019 to 2025 is classified into three sequential stages: connection, collaboration, and symbiosis. The findings indicate that each stage exhibits distinct characteristics, reflecting a progressive transition from linear value co-creation to networked value co-creation and ultimately to ecosystem-based value co-creation. Furthermore, this evolutionary process is jointly driven by four complementary mechanisms: the interest coordination mechanism, information integration mechanism, incentive compatibility mechanism, and environmental coupling mechanism. The findings provide practical insights for enterprises seeking to implement value co-creation strategies within digital innovation ecosystems in the digital economy.*

Keywords— ***Digital innovation ecosystem, Focal firm, Value co-creation, Evolutionary path, Mechanism.***

I. INTRODUCTION

In the digital economy era, digital technologies represented by artificial intelligence, big data, and the Internet of Things (IoT) are fundamentally reshaping organizational innovation paradigms and competitive dynamics. Traditional, firm-centric isolated innovation is progressively giving way to multi-actor, multidimensional, and collaborative digital innovation ecosystems. Consequently, the scope and nature of value co-creation have undergone profound transformations, evolving from dyadic interactions between a firm and its customers toward an ecosystem-oriented network characterized by digital technology enablement and diversified value distribution.

As a foundational segment of the national economy, the food industry's digital transformation has attracted growing attention. The frozen food sector, in particular, faces an urgent need for digitalization due to its extended supply chain, complex production-sales coordination, and stringent cold-chain requirements. Anjoy Foods Group Co., Ltd., a leading enterprise in China's frozen food sector, initiated a systematic digital transformation and supply chain integration in 2019. By 2025, Anjoy became the first dual-listed "A+H" frozen food enterprise in China, consistently leading the industry in revenue, thereby providing a highly representative case for academic inquiry.

Regarding evolutionary paths, Li and Wu (2024)[1] drew on symbiosis theory to show that digital innovation ecosystems consist of focal firms, digital platforms, and research institutions, with mutualistic symbiosis representing the optimal evolutionary trajectory. Wu, Bai & He (2024)[2] adopted a dynamic capabilities perspective to identify three evolutionary stages: integration, extension, and sharing of digital resources. Regarding driving mechanisms, Qiu, Yu & Wang (2024)[3] constructed a "Behavior–Relationship–Value" analytical framework to examine value dynamics across the emerging, developing, and mature stages of digital industry innovation ecosystems. Zhang et al. (2024)[4] demonstrated that the fundamental logic underlying developer-user co-creation is mutual benefit, while Gong, Zhang & Dong (2024)[5] proposed a governance framework focusing on resource balancing, value sharing, and trust-based cooperation. However, existing research primarily focuses on platform-based or high-tech enterprises, leaving traditional food manufacturing—especially the frozen food subsector—under-researched. To address this gap, this study examines Anjoy to address two key questions: How do focal firms drive value co-creation in digital innovation ecosystems? What are the underlying evolutionary paths and mechanisms?

This paper contributes to the literature in three ways: First, it delineates a three-stage evolutionary path of value co-creation—"Connection–Collaboration–Symbiosis"—enriching evolutionary theories of digital innovation ecosystems. Second, it identifies four core mechanisms driving value co-creation (benefit coordination, information integration, incentive alignment, and environmental coupling), establishing a holistic analytical framework for firm-led digital innovation ecosystems. Third, by focusing on the food manufacturing sector, it offers practical insights for peer enterprises undertaking digital transformation and ecosystem-level value co-creation.

II. LITERATURE REVIEW

2.1 DIGITAL INNOVATION ECOYSTEMS

A digital innovation ecosystem represents an integration of digital innovation and innovation ecosystem concepts, extending innovation ecosystem theory into the context of the digital economy. Research suggests that digital innovation ecosystems are complex adaptive systems grounded in data assets, propelled by digital technologies, and linked by digital platforms, achieving deep alignment among actors, resources, technologies, and institutional environments[6]. Key actors include focal digital firms, innovation partners, digital product users, and platform operators[7]. These ecosystems exhibit symbiotic traits, interactive collaboration, digital modularity, and dynamic equilibrium[1][8].

Focal firms possess relative competitive advantages and exert strong spillover effects that lead ecosystem collaboration. They hold superior resources and capabilities in technology, market access, and human capital compared to other actors. Within a digital innovation ecosystem, the focal firm serves as the primary architect—leveraging platform capabilities to orchestrate cross-boundary resources, harmonize multi-party interests, and direct value co-creation.

2.2 VALUE CO-CREATION

Value co-creation is a dynamic process in which actors jointly create value through service exchange and resource integration. In digital innovation ecosystems, value co-creation utilizes data as a key factor of production and digital collaboration as a connecting link, dissolving temporal, spatial, and sectoral barriers to facilitate the efficient flow and deep integration of innovation, market, and ecological resources. Applying service-dominant logic, Zhang et al. (2024) [4] explicated coordination mechanisms between developers and users, highlighting reciprocity as the core logic driving interdependent participation. Mihale-Wilson and Güler (2025)[9] further noted that multi-stakeholder sharing and recombination of technologies, knowledge, and services generate synergistic value exceeding what any single actor could achieve independently.

2.3 INTEGRATED ANALYTICAL FRAMEWORK

Synthesizing existing literature and Anjoy's organizational practices, this study proposes an integrated framework (Figure 1). Following a rigorous "Motivation-Process-Outcome" logical chain, we analyze the evolutionary paths and underlying mechanisms of focal-firm-driven value co-creation to ensure systematic depth.

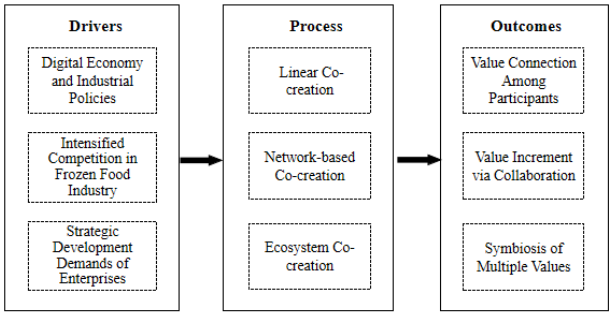

Fig.1: Analytical Framework for Value Co-creation Research at Anjoy Food

III. RESERACH DESIGN

3.1 METHODOLOGY

This study adopts a longitudinal single-case study method to analyze the evolutionary path and mechanisms of Anjoy's value co-creation. The rationale is threefold: First, a longitudinal approach enables long-term tracking of an organization, accurately reflecting continuous organizational change and exposing underlying evolutionary logic; second, it allows researchers to unpack complex transition processes by dividing corporate development into distinct analytical units; third, it incorporates temporal factors to integrate key events and outcomes, offering a granular view of dynamic transformations over time [10].

3.2 CASE SELECTION

Anjoy was selected based on three criteria: (1) Theoretical Sampling / Typicality: Anjoy Food is the first "A+H" dual-listed firm in China's frozen food sector, leading the industry with a revenue of RMB 16.193 billion in 2025; (2) Data Accessibility: The company initiated systematic digital transformation in 2019, providing rich and continuous publicly disclosed data (annual reports, ESG reports, etc.) from 2019 to 2025; (3) Industry Representativeness: Anjoy experienced a complete evolution from channel-driven to digitally enabled, and ultimately to ecosystem-led operations. Industry-specific challenges—long supply chains, complex production-sales coordination, and strict cold-chain requirements—are fully manifested in its transformation.

3.3 DATA COLLECTION AND ANALYSIS

Data were collected from multiple sources: (1) Anjoy's annual reports, sustainability reports, and corporate social responsibility (CSR) reports from 2019 to 2025; (2) Official corporate announcements, third-party equity research reports, and authoritative media coverage. Triangulation across data sources ensured data comprehensiveness and validity.

We identified critical milestone events across Anjoy's transformation to demarcate developmental stages, subsequently coding and mapping these empirical instances against value co-creation archetypes to induce core mechanisms.

IV. EVOLUTIONARY PATHS OF ANJOY'S VALUE CO-CREATION

Anjoy's value co-creation trajectory is driven by market demands, industrial policies, and corporate strategy. Based on practices from 2019 to 2025, we divide its evolution into three sequential stages: Connection, Collaboration, and Symbiosis, representing a transition from linear to networked, and ultimately to ecosystem-level co-creation.

4.1 CONNECTION STAGE: LINEAR CO-CREATION (2019-2020)

Around 2019, rapidly expanding demand for household ready-to-cook meals, decelerating growth in B2B channels, and Anjoy's strategic impulse to transition from a regional brand to a national market leader forced the firm to expand its co-creation boundaries. Anjoy introduced a dual-driven strategy targeting both B2B and C2C segments ("BC Dual-Engine Strategy"), incorporating household consumers into its co-creation network for the first time through the launch of consumer-grade fresh-lock product lines ("Suo Xian Zhuang"). Concurrently, an equity incentive scheme granting 6.31 million restricted shares to 229 core staff aligned internal stakeholders. Digital infrastructure remained nascent: lightweight systems (EAS, WMS, and CRM) were deployed, but their capabilities were siloed to store inventory tracking, distributor order entry, and basic customer data collection, lacking end-to-end integration.

During this stage, value co-creation remained elementary, dominated by a Linear Co-creation mode characterized by top-down, unidirectional value flows. Outcomes included: (1) successful penetration into C-end household consumer markets, establishing a new revenue growth engine with total revenue reaching RMB 6.965 billion; and (2) the initial formation of a nationwide production-sales network as new manufacturing bases in Henan, Hubei, and Sichuan became operational. However, co-creation outcomes were largely confined to direct economic gains

4.2 COLLABORATION STAGE: NETWORKED CO-CREATION (2021-2022)

As revenue expanded, organizational bottlenecks emerged: upstream raw material suppliers remained disconnected from collaborative platforms, and operational data between production and sales remained fragmented. Rapid capacity expansion, cost pressures, and intensifying market competition compelled Anjoy to utilize digital tools for cost reduction, efficiency optimization, and supply chain stabilization.

Regarding actors, Anjoy acquired controlling stakes in Xinhongye and Xinliuwu, converting upstream surimi and crayfish processors from transactional vendors into equity-aligned partners. This established a fully integrated supply chain encompassing "farmers - raw material suppliers - manufacturing bases - diversified distributors - consumers - research institutes." Digitally, Anjoy implemented EDI production IoT, MES manufacturing execution, SRM supplier relationship management, and OM order

management platforms, connecting data flows across procurement, shop-floor manufacturing, cold-chain logistics, and retail distribution. Actors joined a centralized digital middleware platform, enabling mutual exchange of demand and capacity resources to enhance supply chain resilience.

Value co-creation shifted to a Networked Co-creation mode. The structural archetype evolved from a linear chain to a fully connected network, with digital architecture acting as the nervous system. Bilateral resource flows enabled dual breakthroughs in revenue and profitability, rendering Anjoy the first enterprise in China's frozen food sector to exceed RMB 10 billion in revenue in 2022. End-to-end digital deployment substantially improved productivity and inventory turnover, shifting the value focus from purely financial returns to network-wide industrial synergy.

4.3 SYMBIOSIS STAGE: ECOSYSTEM-LEVEL CO-CREATION (2023-2025)

While networked collaboration resolved operational efficiency, the digital footprint remained restricted to commercial actors, excluding non-commercial stakeholders such as government entities, agricultural financial institutions, and environmental service providers. Driven by national ESG, carbon neutrality, and rural revitalization mandates, Anjoy needed a multi-layered digital ecosystem to cultivate mutualistic symbiosis.

Regarding actors, Anjoy expanded its outer ring to include local governments, agricultural banks, environmental service providers, university research groups, and rural cooperatives, forming a three-tier ecological hierarchy. Digitally, Anjoy upgraded to a enterprise-grade ERP system, launched PLM for R&D, LIMS for quality testing, solar energy management systems, and reclaimed water digital monitoring modules, while co-developing an AI-powered smart office platform with DingTalk. Actors across ecological rings leveraged the platform to exchange industrial, administrative, and green resources freely.

Value co-creation reached an Ecosystem-Level Co-creation mode. Supported by an intelligent, green digital stack, actors achieved deep resource integration and multidimensional value creation encompassing operational, social, and environmental performance. In 2025, Anjoy became the first dual-listed "A+H" firm in its industry. Through a digital cooperative model ("Firm + Cooperatives + Farmers"), Anjoy enabled over 6,000 farming households to achieve sustainable income growth while reducing carbon emissions per unit of output. Value outputs transcended financial metrics, yielding a tripartite value system—economic, social, and ecological—that underpins Anjoy's sustainable development.

V. CORE OPERATING MECHANISMS OF VALUE CO-CREATION

To explain the drivers behind Anjoy's evolutionary trajectory, this section conceptualizes four core operating mechanisms: benefit coordination, information integration, incentive alignment, and environmental coupling (see Figure 2).

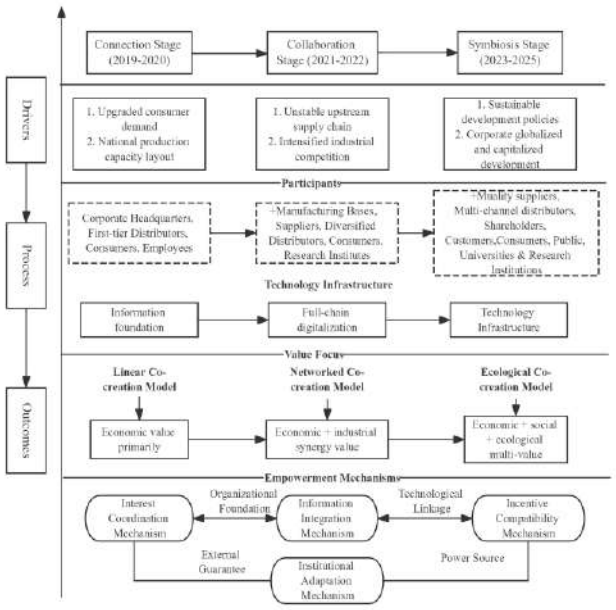

Fig.2: Evolutionary Pathways and Mechanisms of Value Co-creation at Anjoy Food

5.1 BENEFIT COORDINATION MECHANISM

Benefit coordination provides the organizational foundation for multi-actor co-creation by mitigating collaboration costs and establishing a virtuous cycle of "Participation–Contribution–Benefit." Value co-creation between focal and non-focal actors depends on dynamic dynamic gain-sharing; across evolutionary stages, value distribution priority must progressively shift toward non-focal actors to sustain trust and engagement[1]. Anjoy operationalized benefit coordination via: (1) Equity Binding: Acquiring Xinhongye and Xinliuwu to convert suppliers into strategic partners; (2) Risk Mitigating: Utilizing stable procurement commitments to stabilize income expectations for farmers and raw material vendors; and (3) Gain Sharing: Deploying employee stock ownership plans and regular dividend distributions to share value added equitable.

5.2 INOFRMATION INTERGATION MECHANISM

Information integration serves as the technical bond of

value co-creation. Digital resource sharing variability and digital innovation payoff levels positively influence co-creation behaviors [6]. Open, affordant digital technologies dismantle organizational silos, expanding ecosystem participation and facilitating resource matching. Anjoy implemented this across three levels: (1) Data Sensing: IoT and MES implementations integrated real-time operational data across 14 manufacturing bases; (2) Platform Orchestration: Systems such as CRM, SRM, and BI consolidated siloed data into unified information streams, allowing suppliers, distributors, and R&D teams to coordinate on a shared platform; (3) Intelligent Decision-Making: Advanced BI analytics and predictive AI translated raw operational data into actionable strategic insights. This mechanism evolved from basic IT deployment in the Connection stage to end-to-end integration in the Collaboration stage, and intelligent analytics in the Symbiosis stage.

5.3 INCENTIVE ALIGNMENT MECHANISM

Incentive alignment acts as the continuous operational engine, ensuring that individual actors advance their self-interests while aligning with overall ecosystem objectives. During ecosystem evolution, focal firms absorb higher coordination costs to ensure system stability, complemented by enforcement mechanisms against opportunistic behavior that scale with network complexity. Anjoy achieved incentive alignment through: (1) Equitable Value Distribution: Matching stakeholder contributions with proportional returns to eliminate free-riding or perceived exploitation; (2) Procedural Governance: Enhancing transparency and predictability through formalized ESG governance and open information disclosures. Fair distribution incentivizes continuous participation, ensuring long-term ecosystem vitality.

5.4 ENVIRONMENTAL COUPLING MECHANISM

Environmental coupling provides external legitimacy and fit. Ecosystems must establish contextual symbiotic relationships with external institutional environments to buffer against macro uncertainties. Anjoy accomplished environmental coupling by: (1) Policy Alignment: Leading national-level R&D initiatives under China's "14th Five-Year Plan" and establishing official industry standards, transforming policy mandates into innovation momentum; (2) Market Adaptation: Reconfiguring product strategies based on evolving consumer dynamics; (3) Green Compliance: Internalizing ESG standards and clean production protocols into core operational routines; (4) Cultural Reinforcement: Embedding corporate values—"Responsibility, Integrity, Action, and Win-Win"—to foster cohesive corporate governance.

In summary, these four mechanisms interact synergistically, propelling value co-creation from linear formats to an ecosystem-level state and reinforcing long-term enterprise sustainability.

VI. CONCLUSION

6.1 CONCLUSION

Using a longitudinal case study of Anjoy within a "Motivation–Process–Outcome" framework, this paper yields three primary conclusions:

Anjoy's value co-creation followed a three-stage evolutionary trajectory: Connection (actor inclusion and initial connectivity), Collaboration (end-to-end digital integration), and Symbiosis (ESG integration and global expansion), marking a structural transition from linear to networked, and ultimately ecosystem-level co-creation.

Value co-creation is driven by four synergistic mechanisms: benefit coordination, information integration, incentive alignment, and environmental coupling.

The focal firm plays crucial roles as an orchestrator, resource integrator, interest coordinator, and ecosystem leader. Through strategic iteration, digital platform building, and supply chain consolidation, Anjoy successfully transitioned from channel-driven growth to ecosystem-led development.

6.2 PRACTICAL IMPLICATIONS

Adhere to Staged Evolution: Value co-creation unfolds in distinct phases. Enterprises should align resources with the core tasks of each stage rather than pursuing a premature, all-in ecosystem strategy.

Align Digitalization with Strategy: Digital capabilities must directly serve overarching business strategies. Firms should clarify strategic imperatives prior to designing and deploying digital solutions

.Deploy Orchestrated Mechanisms: Sustained value co-creation requires multi-mechanism alignment. Firms must combine benefit coordination, information integration , incentive alignment, and environmental coupling.

6.3 LIMITAITONS AND FUTURE RESEARCH

This study has limitations that suggest avenues for future research: First, relying on a single case may limit statistical generalizability; multi-case comparative designs across diverse industries are recommended. Second, empirical data relied primarily on secondary public disclosures; future studies could incorporate internal field interviews and executive surveys. Finally, as emerging technologies like generative AI and blockchain evolve, future research should explore how next-generation digital

tools reconfigure co-creation dynamics between focal firms and ecosystem actors.

REFERENCES

[1] Li Y Q, Wu L P. Multi-group symbiotic evolutionary mechanisms of a digital innovation ecosystem: Numerical simulation and case study[J]. PLOS ONE, 2024, 19(4): e0300218.

[2] Wu Y, Bai M J, He Z C. Construction of digital innovation ecosystem based on dynamic capability: A case study of Huawei automobile[J]. Journal of Technology Economics, 2024, 43(2): 56-67.

[3] Qiu Rui, Yu Peili, Wang Cengceng. A Review of Value Creation in Digital Industry Innovation Ecosystems[J]. Foreign Economics & Management, 2024, 46(11): 36-50.

[4] Zhang X, Yang L, Gao T, et al. The Coordination Mechanism of Value Co-Creation Between Developers and Users in Digital Innovation Ecosystems[J]. Electron Markets, 2024, 34(1): 1.

[5] Gong, Y., Zhang, Y. & Dong, L. Numerical simulation and governance framework for multi stakeholder symbiotic evolution in digital innovation ecosystems. Sci Rep 15, 23638 (2025). https://doi.org/10.1038/s41598-025-09027-6

[6] Xu, Y., Sun, H., & Lyu, X. (2023). Analysis of decision-making for value co-creation in digital innovation systems: An evolutionary game model of complex networks. Managerial and Decision Economics, 44(5), 2869–2884. https://doi.org/10.1002/mde.3852

[7] Scientific Reports. Numerical simulation and governance framework for multi-stakeholder symbiotic evolution in digital innovation ecosystems[J]. Scientific Reports, 2025, 15: 23638.

[8] Huang R, Mao S (2024) Enhancing the energy level of regional digital innovation ecosystems: A configuration perspective. PLoS ONE 19(10): e0309229. https://doi.org/10.1371/journal.pone.0309229

[9] Mihale-Wilson, C.A., & Güler, A. (2025). Towards Fair Value Distribution of Co-created Value in Digital Ecosystems. European Conference on Information Systems.

[10] Yin R K. Case Study Research: Design and Methods [M]. California: Sage Publications, 1989.