Proceedings of Business and Economic Studies, 2026, Volume 9, Issue 5
http://ojs.bbwpublisher.com/index.php/PBES
Online ISSN: 2209-265X
Print ISSN: 2209-2641

Innovation Ecosystem and Market Response Mechanism of Traditional Manufacturing Industry from the Perspective of Global Value Chain Restructuring

Qi Cao*

The University of Melbourne, Melbourne VIC 3010, Australia

Corresponding author: Qi Cao, qcao3354@student.unimelb.edu.au

Abstract: Against the backdrop of global value chain restructuring and a new wave of scientific and technological revolution, traditional manufacturing industries are undergoing a critical transition from an efficiency-oriented paradigm to a value-oriented model. While existing studies primarily emphasize technological upgrading and operational optimization, this paper re-examines the transformation logic from the perspective of value creation and value appropriation. Drawing on economic theory and within the macro framework of global value chain restructuring, the study argues that the evolution of competitive advantage in traditional manufacturing is characterized by a shift from technology-driven to market-oriented development. It proposes a dynamic collaborative mechanism, demand-driven innovation transformation, and production response to explain how firms restructure their value creation systems through the coupling of innovation ecosystems and market responsiveness. The findings suggest that this transformation represents a systemic reconfiguration of resource allocation and value realization pathways rather than mere technological upgrading. This paper contributes a novel analytical framework for understanding manufacturing upgrading and offers theoretical insights into the evolution of competitiveness in the context of global industrial transformation.

Keywords: Global value chain restructuring; Traditional manufacturing industry; Innovation ecosystem; Market response mechanism

Online publication: June 24, 2026

1. Impacts of global value chain restructuring on the traditional manufacturing industry

Against the background of profound adjustments in the global economic structure and accelerated technological change, global value chains (GVCs) are undergoing comprehensive and deep restructuring. In this context, the

traditional manufacturing development model characterized by low cost, large scale, and efficiency orientation is gradually losing its institutional foundation, exposing firms to a series of structural challenges [1].

From an economic perspective, these impacts are not isolated phenomena but converge on a fundamental issue: a systematic mismatch between the established modes of value creation in traditional manufacturing and the evolving mechanisms of value capture. This mismatch is manifested in at least three interrelated dimensions.

First, the erosion of cost-based comparative advantage constrains the upgrading of traditional manufacturing within GVCs. Historically, firms relied on low-cost labor and resource endowments to embed themselves in low and mid-value-added segments through processing and assembly activities. However, under GVC restructuring, developed economies continue to dominate high-value-added segments through technological capabilities, standards-setting power, and brand advantages, while emerging economies intensify competition through even lower cost structures [2]. This dual pressure, limited upward mobility, and increasing downward substitution trap traditional manufacturing firms in a structural dilemma commonly described as Low-end Lock-in [3]. More fundamentally, this reflects the transition from static cost-based comparative advantages to dynamic capability-based advantages.

Second, the reconfiguration of supply chain structures has significantly increased transaction costs and operational uncertainty. Under the emerging paradigm that places equal emphasis on efficiency and security, the traditional production system based on global specialization and long-chain coordination is increasingly shifting toward regionalization and diversification [4]. While such adjustments enhance resilience and risk mitigation, they also generate higher inventory levels, more complex supplier management, and rising coordination costs [5]. From an economic standpoint, this transformation embodies a trade-off between risk control and cost efficiency, undermining the sustainability of the low-cost operational model on which traditional manufacturing has long depended.

Finally, the rapid evolution of demand structures poses a fundamental challenge to the production and innovation paradigms of traditional manufacturing. As markets shift from standardization and homogeneity toward personalization, diversification, and sustainability, firms are required not only to improve product quality but also to develop capabilities for rapid response and continuous innovation [6]. However, traditional manufacturing has long operated under a production first—sales later logic, resulting in significant time lags and information asymmetries between production systems and market demand [7]. Consequently, the core challenge is no longer merely the possession of technological capabilities, but the ability to effectively translate demand signals into innovation and production decisions. As leading firms increasingly establish efficient closed-loop systems integrating demand–R&D–production through digital technologies, those that remain locked in linear, technology-driven upgrading paths face rapid depreciation of their existing advantages and a gradual erosion of competitiveness.

2 Optimization and upgrading paths of innovation ecosystem and market response mechanism of traditional manufacturing industry from the perspective of global value chain restructuring

2.1. Optimization of the innovation ecosystem of the traditional manufacturing industry

Against the background of global value chain restructuring and increasingly demand-driven dynamics, the core challenge facing the innovation ecosystem of traditional manufacturing industries lies not in the insufficient supply of innovation resources, but in the absence of effective coordination mechanisms among innovation actors [8]. This deficiency leads to a persistent structural mismatch between technological supply and market

demand. Accordingly, the optimization of the innovation ecosystem should be understood as a process of factor reorganization and mechanism reconfiguration, with the central objective of establishing a demand-oriented collaborative innovation system.

First, the restructuring of the innovation ecosystem requires leveraging key nodes of the industrial chain to facilitate the transition from decentralized technological R&D toward collaborative value creation. Traditional manufacturing has long relied on isolated innovation activities and closed R&D systems, which are increasingly inadequate in addressing complex and rapidly evolving market demands. In this context, it is necessary to construct multi-actor collaborative innovation networks led by focal firms, integrating upstream and downstream enterprises as well as research institutions, and embedding innovation activities into critical stages of the industrial chain [9]. The essence of this transformation lies not merely in resource integration but in reducing information asymmetry and coordination costs through institutionalized collaboration mechanisms, thereby enhancing the alignment between technological development and industrial application. Furthermore, by opening production scenarios and explicitly articulating technological needs, innovation activities can shift from a laboratory-oriented paradigm to a scenario-driven model, enabling the effective deployment of innovation resources at the production front line [10].

Second, the effective functioning of the innovation ecosystem depends on the establishment of systematic decision-making mechanisms and process governance, rather than the path-dependent accumulation of technological capabilities. In practice, traditional manufacturing firms often adopt a technology-driven logic, which may lead to insufficient strategic discipline and weak coordination in R&D activities, ultimately undermining the efficiency of innovation resource allocation [11]. Therefore, the critical issue is not the scale of innovation investment, but the extent to which structured, adaptive, and transparent decision-making frameworks can be developed. Specifically, a dynamic innovation management system integrating ante evaluation, in-process adjustment, and post assessment should be implemented to govern activities such as product upgrading, process innovation, and digital transformation [12]. Such a framework enhances both the controllability of innovation processes and the efficiency of resource utilization, while strengthening the capacity to translate technological outputs into economic value.

Finally, the sustainability of the innovation ecosystem hinges on the optimization of factor allocation mechanisms. From an economic perspective, the constraints on innovation in traditional manufacturing stem not only from resource scarcity but also from inefficiencies in resource allocation. As such, institutional arrangements should be designed to facilitate the reallocation of critical factors, including talent, capital, and data, toward high-efficiency innovation activities. At the talent level, greater emphasis should be placed on cultivating interdisciplinary capabilities that bridge technological expertise and market understanding, as well as skilled technical labor and market-oriented analytical capabilities, reducing cognitive gaps between innovation and demand. At the capital level, diversified financing mechanisms should be encouraged to support applied and scenario-based innovation, improving the marginal returns on innovation investment. At the data level, integrating production, market, and quality data into a unified analytical framework can enable data-driven innovation decision-making, enhancing the precision and dynamic optimization of innovation processes [13].

2.2. Improvement of the market response mechanism of the traditional manufacturing industry

Against the backdrop of heightened demand uncertainty and accelerated restructuring of global value chains,

the central challenge facing traditional manufacturing industries lies not in the mere acquisition of market information, but in the ability to construct a response mechanism that effectively translates market signals into production and innovation decisions. In this sense, market responsiveness should be understood not as an information-gathering capability, but as the efficiency of the transformation chain linking information, decision-making, and execution [14]. Accordingly, the optimization of the market response mechanism requires a systematic reconfiguration of this transformation process.

First, the effectiveness of market response mechanisms depends on the accurate identification and structured processing of market signals. Under the traditional model, firms often encounter the paradox of information abundance but decision lag, which fundamentally stems from limited capabilities in filtering, integrating, and interpreting fragmented information [15]. Therefore, the construction of a market information system should not focus solely on expanding data sources but rather on developing analytical mechanisms centered on demand identification and signal extraction. Through such mechanisms, heterogeneous inputs, including order data, channel feedback, and market trends, can be transformed into structured, decision-relevant information. This process enables firms to convert dispersed informational inputs into prioritized demand structures, providing a clear basis for subsequent innovation activities and resource allocation decisions [16].

Second, the enhancement of market responsiveness hinges on the efficiency of internal information flows and the speed of organizational adaptation. Even when firms are capable of identifying demand shifts, bottlenecks in information transmission across functions, such as R&D, production, procurement, and marketing, can result in delayed decision-making and resource misallocation. Thus, the critical issue is not process complexity, but whether a coordination mechanism oriented toward rapid response can be established. By facilitating cross-functional information integration, streamlining key decision nodes, and strengthening demand-driven dynamic adjustment capabilities, firms can transition from linear, sequential operations to network-based, collaborative processes [17]. Such a transformation significantly reduces the time lag between demand recognition and product delivery, thereby enhancing overall responsiveness [18].

Finally, the effective implementation of market response mechanisms ultimately depends on the flexibility and adaptability of the production system [19]. From an economic perspective, the scale-oriented mass production model traditionally adopted by manufacturing firms offers cost advantages under stable demand conditions. However, in the context of increasing demand heterogeneity and volatility, it may lead to inventory accumulation and resource inefficiencies. Consequently, firms need to develop production systems centered on economies of scope and responsiveness by adopting modular design, intelligent manufacturing technologies, and flexible scheduling mechanisms. This shift from efficiency-centered to adaptability-centered production enables firms to accommodate personalized and customized demand while simultaneously improving the overall efficiency of resource allocation [20].

2.3. Collaborative promotion of innovation ecosystem and market response mechanism of traditional manufacturing industry

The transformation of traditional manufacturing industries does not hinge on the optimization of isolated functional domains, but rather on the establishment of a dynamic and coordinated relationship between the innovation ecosystem and the market response mechanism. From a systemic perspective, innovation and market demand do not constitute a linear causal chain. Instead, they form an interactive process characterized by mutual embedding and continuous feedback. Accordingly, the core task is to integrate these dimensions into

a closed-loop mechanism of demand-driven innovation transformation and production response, enabling the dynamic optimization of the value creation process.

First, the market response mechanism should function as the primary entry point of innovation activities, reshaping the direction of resource allocation through the identification, processing, and transmission of demand signals. Under the traditional paradigm, innovation is often dominated by technology-push logic, which may lead to a misalignment between innovation outputs and actual market needs. In this regard, the critical issue is not the level of innovation capability, but whether innovation activities are effectively embedded within the evolving demand structure [21]. By transforming fragmented market information into actionable innovation inputs, the market response mechanism enables a shift from technology-oriented to demand-oriented R&D, improving both the efficiency and directionality of innovation resource allocation.

Second, the innovation ecosystem provides the capability foundation that allows firms to translate demand signals into concrete products and production arrangements. Demand identification alone is insufficient to generate a competitive advantage. Without corresponding technological, organizational, and process capabilities, market signals cannot be effectively converted into supply. Therefore, it is essential to develop an innovation system with strong transformation capacity, in which technological advancement, process optimization, and digital integration collectively enhance the responsiveness and adaptability of production systems [22]. Through such capability reconfiguration, firms are able to shorten the cycle from demand recognition to product delivery, thereby strengthening their ability to respond to dynamic market conditions.

Finally, the effective coupling between the innovation ecosystem and the market response mechanism depends on organizational integration and institutional alignment. From an economic perspective, the disconnection between innovation and market response is often rooted in misaligned information flows and incentive structures. As such, it is necessary to break down functional silos between R&D, production, and market-facing units through cross-level and cross-actor coordination mechanisms. By aligning demand forecasting, innovation decision-making, and supply execution within a unified governance framework, firms can transition from passive market adaptation to active participation in value creation. This transformation not only enhances internal coherence but also facilitates the upgrading of firms from low-end embedding to higher-value participation within the restructured global value chain [23].

2.4. Institutional support and enabling conditions for the transformation and upgrading of traditional manufacturing

The effective functioning of the innovation ecosystem and market response mechanism depends not only on the optimization of firm-level capabilities but also on the support of external institutional arrangements and infrastructural conditions governing factor mobility and resource allocation. In essence, the realization of the closed-loop mechanism of demand-driven innovation transformation and production response is contingent upon an enabling environment that reduces transaction costs, enhances coordination efficiency, and facilitates the efficient circulation of key production factors. Therefore, the transformation and upgrading of traditional manufacturing industries require the construction of complementary institutional support systems at a broader systemic level [24].

First, the development of public service platforms serves as an institutional complement to improve the efficiency of innovation factor allocation. Within traditional manufacturing systems, small and medium-sized enterprises (SMEs) are often constrained by limited resources, making it difficult for them to independently

undertake high-cost activities such as R&D, testing, and talent development. As a result, their capacity to participate in innovation and market competition remains restricted. The fundamental issue, therefore, lies not in enhancing the capabilities of individual firms in isolation, but in enabling resource sharing and reallocation through platform-based mechanisms [25]. By establishing integrated public platforms encompassing technological R&D support, data services, and talent training, it is possible to lower the barriers to innovation and market responsiveness, thereby improving the overall collaborative efficiency of the industry within the value chain.

Second, the optimization of supply chain structures constitutes a critical prerequisite for enhancing the stability and effectiveness of market response mechanisms. As global value chains shift from a purely efficiency-oriented model toward one that balances efficiency and security, traditional configurations characterized by excessive reliance on single sourcing and extended production networks have become increasingly vulnerable to uncertainty [26]. From an economic perspective, this reflects the rising prominence of supply chain risks and associated transaction costs. Consequently, it is necessary to restructure the supply chain organization through regionalization, supplier diversification, and strengthened coordination mechanisms. Such adjustments can enhance resilience and adaptability while preserving operational efficiency, providing a stable foundation for responsive production and delivery systems.

Third, the adoption of digital technologies represents not merely a tool-based upgrade but a fundamental transformation of information processing and decision-making structures. In traditional manufacturing systems, delayed information transmission and elongated decision chains constitute major constraints on responsiveness. The key issue, therefore, is not the adoption of digital tools, but whether digitalization can be leveraged to reconfigure the transformation mechanism linking information, decision-making, and execution. By embedding digital technologies across R&D, production, and market interfaces, firms can achieve real-time demand sensing and rapid feedback loops, significantly enhancing the coordination efficiency between innovation and production systems [27].

Finally, the broader institutional environment and policy framework provide long-term incentives and constraints that shape firm behavior and strategic choices. From the perspective of institutional economics, firm-level transformation is deeply embedded in external rule systems and governance structures. Thus, reducing uncertainty and institutional costs through policy guidance, regulatory design, and supportive governance frameworks is essential to encourage firms to engage in innovation and value chain upgrading [28]. At the same time, improving industry standards and maintaining a fair competitive order can foster a market environment oriented toward innovation and quality, offering a stable institutional foundation for the coordinated operation of innovation ecosystems and market response mechanisms.

3. Illustrative case: Structural challenges and transformation pressures in a leading manufacturing firm HT

With the profound restructuring of global value chains, the sustainability of competitive advantage in traditional manufacturing increasingly depends on firms' ability to reconfigure their value creation mechanisms. To illustrate the practical relevance of the proposed analytical framework, this section examines HT, a leading global manufacturer of injection molding machines. Its development track reflects both the strengths of the traditional manufacturing model and the emerging constraints under changing global conditions.

HT's rise to industry leadership has largely been driven by an efficiency-oriented development model characterized by cost competitiveness, standardized production, and large-scale manufacturing. Leveraging strong cost control and mature production capabilities, the firm has established a solid position in the mid-range segment of the global market, particularly in industries producing standardized consumer goods [29]. However, this model is increasingly challenged by structural changes in both the competitive landscape and demand conditions.

First, the firm faces significant barriers to upgrading toward higher value-added segments. Advanced markets remain dominated by established European and American manufacturers with strong technological capabilities, particularly in high-precision machinery, advanced materials processing, and integrated control systems. These technological barriers constrain upward mobility and suggest that existing innovation capabilities may be insufficient to support a transition to high-end applications [30]. Within the analytical framework of this study, this reflects a limitation in innovation transformation capacity, where technological upgrading remains path-dependent and insufficiently aligned with evolving demand.

Second, intensified competition from latecomer firms has eroded the sustainability of cost-based advantages. As manufacturing capabilities diffuse across emerging economies, an increasing number of competitors are able to offer comparable products at lower prices, intensifying price competition in the mid-range market [31]. This trend places the firm under a dual pressure of constrained upward upgrading and increased downward substitution, leading to a structural squeeze commonly observed as middle-position instability within global value chains.

Third, the evolution of downstream demand structures imposes new requirements on responsiveness and customization. Emerging sectors, such as new energy vehicles, high-end consumer electronics, and precision manufacturing, demand not only improved product performance but also faster response times, greater flexibility, and integrated solutions [32]. However, traditional production models centered on standardization and economies of scale are increasingly inadequate for addressing such heterogeneous and dynamic demand. This highlights a critical limitation in market response mechanisms, particularly in the ability to translate demand signals into timely innovation and production adjustments.

Taken together, these challenges indicate that the sustainability of HT's competitive advantage can no longer rely solely on efficiency-based factors. Rather, it increasingly depends on the firm's ability to establish an effective closed-loop system integrating demand identification, innovation transformation, and production response. From this perspective, several transformation directions emerge. Firms need to strengthen demand-oriented innovation by embedding R&D activities more closely within downstream application scenarios, thereby enhancing the alignment between technological development and market needs. At the same time, improving internal coordination mechanisms is essential to facilitate faster information flows and more efficient decision-making across functional units, enabling a more responsive and flexible production system. In addition, shifting from standardized product provision toward integrated solutions and service-oriented offerings is critical for capturing higher value within the value chain.

Overall, this case demonstrates that the core challenge facing leading firms in traditional manufacturing lies not in the absence of competitive advantage, but in the sustainability of existing advantage structures under evolving global conditions. It provides indicative evidence that the transition from efficiency-oriented to value-oriented development is not only necessary but fundamentally contingent upon the reconfiguration of the mechanisms linking demand, innovation, and production.

4. Conclusion

From the perspective of global value chain restructuring, this paper systematically examines the structural challenges confronting traditional manufacturing industries under shifting demand conditions and evolving competitive dynamics. The paper proposes a dynamic collaborative mechanism centered on demand-driven innovation transformation and production response to explain the reconfiguration of value creation processes. The analysis suggests that the transformation of traditional manufacturing is not merely a process of technological upgrading or managerial optimization, but a fundamental restructuring of value creation logic and resource allocation mechanisms.

As technological capabilities alone become insufficient to sustain competitive advantage, the core challenge for firms has shifted from how to produce to why value is created and how it is realized. In this context, market orientation should not be understood as a marginal adjustment in marketing strategy, but as a central driver in reshaping both innovation systems and production processes. Only through the deep integration of innovation ecosystems and market response mechanisms can firms continuously build and sustain competitive advantages under conditions of increasing global uncertainty.

Therefore, the future development path of traditional manufacturing should move beyond efficiency enhancement toward the construction of a value-oriented system characterized by demand initiation, innovation enablement, and responsive production. Through this transformation, firms can gradually shift from passive participants embedded in global value chains to proactive actors engaged in value creation and shaping, thereby securing more advantageous positions in the evolving global competitive landscape.

Disclosure statement

The author declares no conflict of interest.

References

[1] Ascic I, Ascic J, Hilletofth P, et al., 2022, An Evaluation of Critical Capabilities and Improvement Areas for Competitive Manufacturing in a Developed-Country Environment. Sustainability, 14(11): 6678. https://doi.org/10.3390/su14116678

[2] Babu MM, Rahman M, Alam A, et al., 2004, Exploring Big Data-driven Innovation in the Manufacturing Sector: Evidence from UK Firms. Annals of Operations Research, 2004(333): 689–716. https://doi.org/10.1007/s10479-021-04077-1

[3] Bednarski L, Roscoe S, Blome C, et al., 2025, Geopolitical Disruptions in Global Supply. Chains: A State-of-the-art Literature Review. Production Planning & Control, 36(4): 536–562. https://doi.org/10.1080/09537287.2023.2286283

[4] Chen ZX, 2022, An Empirical Examination on the Links of Cross-functional Integration of Production-marketing, BTO Competitiveness and Performance. European Journal of Management Studies, 27(2): 173–203. https://doi.org/10.1108/EJMS-06-2021-0053

[5] Cirera X, Frias J, Hill H, et al., 2020, A Practitioner's Guide to Innovation Policy: Instruments to Build Firm Capabilities and Accelerate Technological Catch-Up in Developing Countries. Would Bank Group. https://doi.org/10.1596/33269

[6] De Marco CE, Di Minin AD, Marullo C, et al., 2019, Digital Platform Innovation in European SMEs: An analysis of SME Instrument Business Proposals and Case Studies. Publications Office of the European Union. https://doi.

org/10.2760/57240

[7] Díaz Pacheco RA, Benedito E, 2024, Analysis of Supply Chain Response Frameworks: A. Literature Review. Logistics, 8(3): 63. https://doi.org/10.3390/logistics8030063

[8] Edh Mirzaei N, Hilletofth P, Pal R, 2021, Challenges to Competitive Manufacturing in High-Cost. Environments: Checklist and Insights from Swedish Manufacturing Firms. Operations Management Research, 2021(14): 272–292. https://doi.org/10.1007/s12063-021-00193-0

[9] Edmunds A, Morris A, 2000, The Problem of Information Overload in Business Organisations: A Review of the Literature. International Journal of Information Management, 20(1): 17–28. https://doi.org/10.1016/S0268-4012(99)00051-1

[10] Global Machinery Hub, 2025, Global Top 10 Injection Molding Machine Manufacturers in 2025. https://machineryindustrys.com/global-top-10-injection-molding-machine-manufacturers-in-2025/?

[11] Guo Y, Liu F, Song J, Wang S, 2025, Supply Chain Resilience: A Review from the Inventory Management Perspective. Fundamental Research, 5(2): 450–463. https://doi.org/10.1016/j.fmre.2024.08.002

[12] Han L, Hou HP, Bi ZM, et al., 2024, Functional Requirements and Supply Chain. Digitalization in Industry 4.0. Information Systems Frontiers, 2024(26): 2273–2285. https://doi.org/10.1007/s10796-021-10173-1

[13] Höse K, Amaral A, Götze U, et al., 2023, Manufacturing Flexibility through Industry 4.0. Technological Concepts—Impact and Assessment. Global Journal of Flexible Systems Management, 2023(24): 271–289. https://doi.org/10.1007/s40171-023-00339-y

[14] Howard JH, 2026, Governing Innovation Ecosystems: Coordination for Translation. Acton Institute for Policy Research and Innovation. https://www.actoninstitute.au/post/governing-innovation-ecosystems-from-market-networks-to-state-direction?

[15] Kazantsev N, Petrovskyi O, Muller JM, 2023, From Supply Chains Towards Manufacturing. Ecosystems: A System Dynamics Model. Technological Forecasting and Social Change, 197(1): 122917. https://doi.org/10.1016/j.techfore.2023.122917

[16] Leydesdorff L, Ivanova I, 2016, "Open Innovation" and "Triple Helix" Models of Innovation: Can Synergy in Innovation Systems be Measured? Journal of Open Innovation: Technology, Market, and Complexity, 2(3): 1–12. https://doi.org/10.1186/s40852-016-0039-7

[17] Li Y, Sun HY, Huang JC, et al., 2020, Low-End Lock-In of Chinese Equipment Manufacturing Industry and the Global Value Chain. Sustainability, 12(7): 2981. https://doi.org/10.3390/su12072981

[18] Lin XW, Lan YN, Zheng RA, et al., 2026, Do Focal Firms' Industrial Internet Platforms. Promote Innovation along the Supply Chain? Economics Letters, 2026(265): 113017. https://doi.org/10.1016/j.econlet.2026.113017

[19] Mejjaouli S, Tadj L, 2026, Dynamic Innovation Portfolio Management: A Model Predictive Control Approach for Product-Process Innovation Trade-Offs. Processes, 14(3): 557. https://doi.org/10.3390/pr14030557

[20] Murphree M, Breznitz D, 2026, China, Global Value Chains, and the Middle-income Trap. Business and Politics, 28(1): 10–28. https://doi.org/10.1017/bap.2024.37

[21] Ojha VK, Goyal S, Chand M, et al., 2024, A Framework for Data-driven Decision Making in Advanced Manufacturing Systems: Development and Implementation. Concurrent Engineering, 2024(32):1–4. https://doi.org/10.1177/1063293X241297528

[22] Olausson D, Magnusson T, Lakmond, N, 2009, Preserving the Link between R&D and Manufacturing: Exploring Challenges Related to Vertical Integration and Product/process Newness. Journal of Purchasing and Supply Management, 15(2): 79–88. https://doi.org/10.1016/j.pursup.2008.12.004

[23] O'Leary-Kelly S, Flores BE, 2002, The Integration of Manufacturing and Marketing/sales Decisions: Impact on Organizational Performance. Journal of Operational Management, 20(3): 221–240. https://doi.org/10.1016/S0272-6963(02)00005-0

[24] Plastech, 2026, Haitian International Increases Revenue by 10% in 2025. https://www.plastech.biz/en/news/Haitian-International-increases-revenue-by-10-in-2025-21946?

[25] Sekliuckiene J, Rybakovas E, 2023, The Quest for Regionalization of Global Value Chains in a Pandemic. Global Business Environment. Engineering Economics, 34(2): 230–239. https://doi.org/10.5755/j01.ee.34.2.31640

[26] Srai JS, Kumar M, Graham G, et al., 2016, Distributed Manufacturing: Scope, Challenges and Opportunities. International Journal of Production Research, 54(23): 6917–6935. https://doi.org/10.1080/00207543.2016.1192302

[27] Stefano GD, Gambardella Al, Verona G, 2016, Technology Push and Demand Pull Perspectives in Innovation Studies: Current Findings and Future Research Directions. Research Policy, 41(8): 1283–1295. https://doi.org/10.1016/j.respol.2012.03.021

[28] Wang Y, Huang C, Ye XT, et al., 2025, Linkage and Coordination: Industrial Digital. Transformation from the Perspective of Innovation Ecosystem. Technovation, 2025(144): 103228. https://doi.org/10.1016/j.technovation.2025.103228

[29] Watson N, Zheng Y, 2005, Decentralized Serial Supply Chains Subject to Order Delays and. Information Distortion: Exploiting Real-Time Sales Data. Manufacturing & Service Operations Management, 7(2): 152–168. https://doi.org/10.1287/msom.1050.0074

[30] Weckenborg C, Schumacher P, Thies C, et al., 2024, Flexibility in Manufacturing System. Design: A Review of Recent Approaches from Operations Research. European Journal of Operational Research, 315(2): 413–441. https://doi.org/10.1016/j.ejor.2023.08.050

[31] Xia YC, Shenoy M, Jazdi N, et al., 2023, Towards Autonomous System: Flexible Modular. Production System Enhanced with Large Language Model Agents. International Conference on Emerging Technologies and Factory Automation, 2023(28): 1–8. https://doi.org/10.1109/ETFA54631.2023.10275362

[32] Zhang HR, Hu YM, Shi XW, et al., 2022, When and How Do Innovation Ecosystems Outperform. Integrated Organizations? On Technological Interdependencies and Ecosystem Performance. Industrial Management & Data Systems, 122(9): 2091–2120. https://doi.org/10.1108/IMDS-11-2021-0720