ERP System Facilitates Digital Transformation in New Energy Vehicle Enterprises: A Case Study of Xiaomi Automobile Factory

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Abstract: In the era of digital economy, the new energy vehicle (NEV) industry is facing challenges from traditional manufacturing models, such as low efficiency, high costs, and insufficient flexibility, which urgently require the adoption of advanced digital technologies for digital transformation to enhance competitiveness. This paper takes Xiaomi Automobile Factory as an example to explore the critical role of enterprise resource planning (ERP) system in the digital transformation of NEV enterprises. Through case analysis, combined with the practical application of ERP system in Xiaomi's core operational areas−supply chain, finance, production, and sales−the study reveals that ERP system supports Xiaomi's "tripartite integration" digital transformation framework. Specifically, ERP system have significantly optimized supply chain collaboration efficiency, reduced procurement and inventory costs, established a comprehensive financial system and intelligent production planning, while improving customer service accuracy and market responsiveness. By analyzing the successful implementation of the ERP system at Xiaomi Automobile Factory, this research provides valuable insights for the digital transformation of other NEV enterprises, thereby promoting the development and innovation of the NEV industry.

1 INTRODUCTION

In the digital economy era, the significance of enterprise digital transformation has become increasingly prominent, particularly for the manufacturing sector, where it has emerged as a core driver for enhancing competitiveness. Propelled by energy conservation/emission reduction mandates and the wave of intelligent manufacturing, the automotive industry—a pillar of national economies—is undergoing a paradigm shift from "traditional manufacturing" to "smart manufacturing" (Xiao, Cao, & Xia, 2024). Within this transition, new energy vehicles (NEVs) have emerged as a disruptive force, rapidly capturing market share. Meanwhile, traditional automakers constrained by rigid assembly line processes—plagued by high costs, low efficiency, and operational inflexibility—struggle to adapt to the NEV market's demands for personalization and sustainability (Yao, 2024). Against this backdrop, enterprise resource planning (ERP) system has proven instrumental in driving digital transformation for NEV enterprises. These systems inject dynamism into organizational restructuring by pursuing three strategic objectives: efficiency enhancement, quality optimization, and ecosystem collaboration. Through holistic reinvention of automotive supply chains, financial operations, production systems, and beyond, ERP implementation represents an essential pathway for overcoming industry bottlenecks and achieving sustainable development (Tang, 2024).

As a representative case of "cross-boundary vehicle manufacturing," Xiaomi Automobile Factory has positioned digital transformation as its strategic core. Utilizing the SAP S/4HANA Cloud ERP system as a critical tool, the company has efficiently integrated supply chain, financial, and production processes, achieving the goals of cost reduction and efficiency improvement. This initiative demonstrates unique research value and practical significance in the field of intelligent manufacturing. Therefore, this paper selects Xiaomi Automobile Factory as the research subject. The study primarily employs case analysis to: (1) Track and analyze the implementation

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process of the ERP system at Xiaomi Automobile Factory; (2) Collect relevant data to evaluate the operational benefits of the ERP system; (3) Investigate the pathways and value creation mechanisms of its digital transformation.

Through this approach, the research aims to elucidate the critical role of ERP system in Xiaomi Automobile Factory's digital transformation. The findings are expected to provide strategic references for other new energy vehicle (NEV) enterprises and contribute to strengthening the competitive position of China's automotive industry in the global market.

2 ERP MANAGEMENT SYSTEM

The ERP system is a highly integrated information management framework designed to consolidate and manage core business processes and resources across various organizational departments through a unified platform. Typically, ERP system integrates functional modules such as supply chain management, finance, production, and sales operations into a real-time data sharing and processing platform. This integrated management system eliminates information silos between departments through data consolidation, enabling real-time organizational collaboration and providing decision-making support. Furthermore, ERP system facilitates continuous monitoring and analytical reporting of enterprise operations, allowing management to promptly identify operational challenges and opportunities. Effective implementation of ERP system can significantly enhance organizational management efficiency and operational performance, playing a crucial role in data synchronization, resource allocation optimization, and risk mitigation, thereby strengthening corporate competitiveness in the marketplace (Bao, 2024).

3 APPLICATION OF ERP MANAGEMENT SYSTEM IN XIAOMI AUTOMOBILE FACTORY

Positioning digital transformation as a core strategic initiative, Xiaomi Automobile has established an integrated tripartite digital transformation framework encompassing a centralized data platform, cloud-based architecture, and smart manufacturing systems, with the ERP system serving as a pivotal component. As detailed in Table 1, the ERP system demonstrates critical functional alignments with Xiaomi's digital transformation architecture. The projected implementation timeline of the ERP system in Xiaomi's automotive production facilities is systematically outlined in Table 2 (ERPYUAN, 2024).

Table 1: Integration of ERP system with Xiaomi Automobile's digital transformation framework.

Component	Functional Implementation
Centralized Data Platform	Unified collection, storage, and analysis of enterprise-wide operational data to support cross-departmental business decision-making
Cloud Architecture	Implementation of SAP S/4HANA Cloud establishes flexible, scalable, and easily deployable IT infrastructure that accommodates rapid business expansion
Smart Manufacturing	ERP-MES integration (e.g., with JianDaoYun MES) facilitates digital transformation and intelligent automation of production processes

Table 2: Projected implementation timeline of ERP system in Xiaomi Automotive.

Year	Phase	Key Activities
2021	Planning & Requirements Analysis	• March project initiation • ERP strategic alignment • Cross-functional requirements mapping
2022	Development & Testing	• Soft tooling vehicle completion • ERP-enabled supply chain coordination • Production simulation validation
2023	Mass Production Readiness	• ERP-driven production scheduling • AI-powered quality control integration • Automated order management deployment
2024	Commercialization & Delivery	• ERP-channel integration (sales networks) • Real-time customer order tracking • Post-sales service digitization

3.1 Supply Chain Management

Supply Chain Management (SCM) refers to the systematic coordination of suppliers, manufacturers, and distribution facilities to optimize manufacturing, logistics, distribution, and retail operations, encompassing the complete cycle from raw material procurement to finished product delivery. By implementing ERP systems to facilitate intelligent supply chain optimization, Xiaomi Automobile achieves cost efficiency while maximizing operational returns. The specific applications of the ERP system in supply chain management at Xiaomi Automobile's manufacturing facilities are detailed in Table 3 (Pei, 2023).

Table 3: ERP system applications in supply Chain management.

Components	Implementation
Supplier Management	Centralized management of supplier information including qualifications, performance evaluation, and contract administration, eliminating information silos to ensure supply chain stability and reliability
procurement	Automated purchase order generation reduces manual operations, shortens procurement cycles, and lowers purchasing costs
Inventory Control	Real-time inventory monitoring with stock alerts and automated replenishment functions enhances inventory turnover rates and reduces holding costs
Logistics	Integration of logistics information achieves process transparency, improving supply chain efficiency and operational agility

3.2 Financial Management

The ERP system at Xiaomi Automobile enables comprehensive financial management spanning from accounting operations to analytical processes. Through ERP implementation, financial data is systematically recorded, accounting procedures standardized, and a unified control framework established. By adopting an integrated end-to-end management system, financial personnel transition from manual bookkeeping to a centralized model focusing on fund management, financial reporting, and regulatory compliance. This ERP-driven transformation optimizes financial system functionalities through enhanced data transparency and operational efficiency, ultimately elevating financial governance capabilities and strategic decision-making proficiency (Han, 2024).

3.3 Production Manufacturing

Automobiles represent highly sophisticated industrial products, where the manufacturing process constitutes the pivotal phase for Xiaomi Automobile's transition from conceptual design to mass production. This stage directly impacts core competitiveness, cost structure optimization, and market performance metrics. By implementing digitalized and intelligent manufacturing systems through innovative technological integration, Xiaomi achieves accelerated production scaling while maintaining stringent quality assurance and safety compliance protocols, thereby establishing a sustainable presence in the global new energy vehicle market (Wang, 2024). The specific applications of the ERP system in Xiaomi Automobile's production manufacturing processes are systematically detailed in Table 4.

Table 4: ERP system applications in production manufacturing.

Production Process Components	ERP System Implementation
Production Planning	ERP automatically generates production schedules based on market demand analysis, order portfolios, and inventory profiles to ensure optimal resource allocation
Production Progress Management	Real-time monitoring of manufacturing workflows through ERP enables prompt anomaly resolution and strict schedule adherence
Quality Control	ERP-integrated quality management modules enforce end-to-end traceability from raw material inspections to finished product testing, ensuring compliance with QA/QC standards

3.4 Sales & Customer Relationship Management

The sales and customer engagement process significantly contribute to Xiaomi Automobile's market value realization, directly influencing brand appeal, customer retention rates, and sustainable growth. By leveraging online-offline integrated sales channels, transparent pricing strategies, and data-driven order management systems, Xiaomi efficiently engages target consumers while establishing trust. Capitalizing on its intelligent ecosystem advantages—including vehicle-infotainment connectivity and user profiling analytics—the company delivers personalized services and full lifecycle experiences encompassing test drives, delivery, after-sales support, and over-the-air (OTA) updates. This approach not only strengthens customer loyalty but also drives product innovation through user feedback mechanisms, ultimately achieving sales breakthroughs and brand differentiation in the competitive new energy vehicle market. The ERP system's applications in post-delivery customer relationship management at Xiaomi Automobile are detailed in Table 5 (Wang, 2024).

Table 5: ERP system applications in customer relationship management.

CRM Components	ERP System Implementation
Sales Channel Integration	ERP unifies online-offline sales channels with advanced data analytics capabilities, enabling statistical analysis of sales performance to inform strategy formulation
Customer Service	ERP delivers full lifecycle service management through comprehensive tracking of customer profiles and requirements, facilitating personalized offerings that enhance satisfaction and loyalty rates
Order Management	ERP enables end-to-end order processing from reception to fulfillment, ensuring operational efficiency and delivery accuracy

4 BENEFITS OF ERP SYSTEM IMPLEMENTATION AT XIAOMI AUTOMOBILE FACTORY

4.1 Cost Optimization & Efficiency Enhancement

4.1.1 Reduction in Supply Chain, Procurement, and Production Costs

Post-ERP implementation at Xiaomi Automobile's manufacturing facilities, significant cost reductions across supply chain operations, procurement activities, and production processes have been substantiated through recent financial disclosures, as evidenced by empirical data from authoritative sources (Daily Economic News, 2025; Wen, 2024; Lü, 2024). These cost-saving achievements are systematically quantified in Table 6.

Table 6: Financial performance metrics of Xiaomi Automobile.

Item	2024Q2	2024Q3	2024Q4
Operating Revenue (Billion)	64	97	167
Net Loss (billion)	18	15	7
Gross Margin (%)	15.4	17.1	18.5

Gross margin, a critical indicator of corporate profitability, has remained at elevated levels for Xiaomi Automobile since product launch. In Q4 2024, the company achieved a gross margin of 18.5%, significantly outperforming the industry average of 4.6%. Concurrently, quarterly operating revenue demonstrated 72% sequential growth while net losses continued to contract. Notably, these financial improvements occurred during Xiaomi Automobile's capital-intensive expansion phase, collectively demonstrating exceptional operational efficiency that suggests imminent profitability transition.

4.1.2 Operational Efficiency Improvement Through Automation

The integration of ERP with Manufacturing Execution Systems (MES) enables automated purchase order generation and real-time monitoring of equipment status and workflow processes. This digital management framework replaces manual supervision, reducing human intervention while minimizing operational errors, thereby enhancing both customer satisfaction and production efficiency.

Although Xiaomi Automobile has not disclosed specific metrics in this domain, industry benchmarking data from Foton Motor's new energy vehicle division reveals that ERP-MES integration achieved a 10% improvement in order fulfillment rates and 5% production efficiency gains, demonstrating optimized resource utilization and output maximization (China Listed Companies Association, 2024).

Regarding financial operations, the ERP system establishes a comprehensive financial analysis framework that improves accounting efficiency and accuracy. While Xiaomi Automobile has not released quantitative evidence, Foton Motor's implementation of its SuperTruck ERP system developed multi-dimensional cost analysis models. Post-implementation, their financial cost accounting efficiency improved significantly, reducing monthly closing cycles from 3 days to 1 day, with vehicle standard cost accounting accuracy reaching 99% - foundational enhancements for profitability optimization (China Listed Companies Association, 2024).

4.2 Quality Enhancement & Process Acceleration

4.2.1 Product Quality Improvement & Defect Rate Reduction

The ERP system facilitates quality control by replacing manual visual inspections with AI-powered defect detection systems. Through real-time analysis of production data, high-precision anomaly identification is achieved, enabling proactive mitigation of potential quality issues and elevating defect-free rates to industry-leading benchmarks.

Concurrently, the ERP system implements dynamic supplier evaluation protocols to eliminate underperforming vendors, thereby optimizing component procurement quality. For instance, the stable supply partnership with Contemporary Amperex Technology Co. Limited (CATL) ensures consistent reliability of battery systems (Wang, 2024).

4.2.2 R&D-Production Cycle Compression

The ERP system integrates data flows between Xiaomi Automobile Factory's R&D division (3,400-member team) and manufacturing operations, enabling real-time synchronization of design blueprints, bill of materials (BOM), and production scheduling. This digital thread eliminates operational latency and resource waste. While quantitative cycle metrics remain undisclosed, industry validation exists through premium automakers like BMW AG, which leverages analogous ERP solutions to achieve seamless order-to-production integration and rapid customization response capabilities.

Through ERP-optimized dual-shift operations at the Beijing Yizhuang Factory, post-July 2024 production line upgrades doubled per-shift capacity. Delivery cycles were compressed from 25-28 weeks to under 20 weeks, with annual delivery targets elevated from 100,000 to 135,000 units in 2024. Concurrently, capacity utilization rates improved, while economies of scale effectively diluted per-unit R&D and manufacturing costs.

5 CONCLUSION

This study explores the application of ERP management systems in Xiaomi Automobile's manufacturing operations and their associated benefits, revealing the critical role ERP systems play in the digital transformation of new energy vehicle enterprises. Through case analysis, it demonstrates that ERP systems significantly enhance operational efficiency and reduce production costs by integrating core processes across supply chain management, financial operations, production planning, and sales. Key outcomes include optimized supply chain collaboration, standardized financial workflows, intelligent production scheduling, and personalized customer service. The implementation of ERP systems has driven Xiaomi's digital transformation, enabling the achievement of cost reduction, efficiency improvement, quality enhancement, and accelerated production timelines. These advancements have supported rapid sales growth in a highly competitive market. The findings indicate that Xiaomi's successful practices provide valuable insights for digital transformation initiatives in the new energy vehicle industry. As artificial intelligence (AI), the Internet of Things (IoT), and blockchain technologies continue to evolve, the functional scope of ERP systems will expand further. These systems not only help enterprises eliminate information silos but also optimize resource allocation and operational processes through data-driven decision-making. For other new energy vehicle companies pursuing ERP-enabled digital transformation, it is recommended to prioritize alignment between system capabilities and business requirements, strengthen cross-departmental collaboration, and actively explore open ecosystem partnerships. Such strategic measures will ensure

sustainable development amid the dual trends of green energy adoption and intelligent digitalization, injecting innovation momentum into the automotive industry's ongoing transformation.

While this research systematically examines the role of ERP systems in Xiaomi Automotive's digital transformation, several methodological limitations warrant acknowledgment. The single-case study design, focused on one enterprise, restricts the generalizability of conclusions, necessitating further validation through comparative multi-case analyses. Additionally, limited access to Xiaomi's operational specifics—such as ERP implementation timelines and financial reconciliation efficiency—has required reliance on inferential reasoning and hypothetical assumptions derived from disclosures by peer enterprises, potentially affecting analytical precision. Furthermore, the constrained research timeframe precluded assessment of ERP systems' long-term strategic impacts on Xiaomi Automotive.

Future research directions include extending the observation window to evaluate ERP's sustained organizational influence, systematically monitoring Xiaomi's official disclosures to collect operational datasets, and refining implementation benefit analyses to enhance scholarly rigor. Comparative investigations across NEV manufacturers of varying scales will empirically validate ERP systems' adaptability in automotive digital transformation initiatives, while cross-industry benchmarking could reveal sector-specific optimization pathways. These efforts will advance theoretical frameworks for intelligent manufacturing ecosystems while informing practical strategies for Industry 4.0 adoption.

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