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| RESEARCH ARTICLE

Strengthening U.S. Global Leadership in Electric Vehicle Supply Chains Through AI-Driven Fintech Innovation: A Comprehensive Interdisciplinary Analysis

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| ABSTRACT
This study examines how artificial intelligence (AI) and fintech innovation can strengthen U.S. leadership in electric vehicle (EV) supply chains. As global competition intensifies among major economies—particularly the United States, China, and the European Union—the United States must enhance supply-chain resilience, battery sourcing security, infrastructure financing, and advanced manufacturing competitiveness. The paper proposes a comprehensive AI-driven fintech framework integrating five core pillars: predictive analytics, blockchain traceability, digital twins, embedded finance, and intelligent risk management. Drawing upon recent interdisciplinary research in AI applications, healthcare analytics, supply-chain optimization, EV adoption behavior, charging infrastructure deployment, and financial transformation, the study argues that AI-enabled financial ecosystems can substantially improve capital allocation, operational efficiency, sustainability performance, and national competitiveness. The findings suggest that coordinated investments in AI, clean energy technologies, fintech infrastructure, and advanced manufacturing can reinforce U.S. economic leadership while simultaneously accelerating the global transition toward sustainable mobility. Policy recommendations, industry implications, and future research directions are discussed.

| KEYWORDS
Artificial intelligence, electric vehicles, fintech, supply chain, blockchain, digital twin, charging infrastructure, U.S. competitiveness

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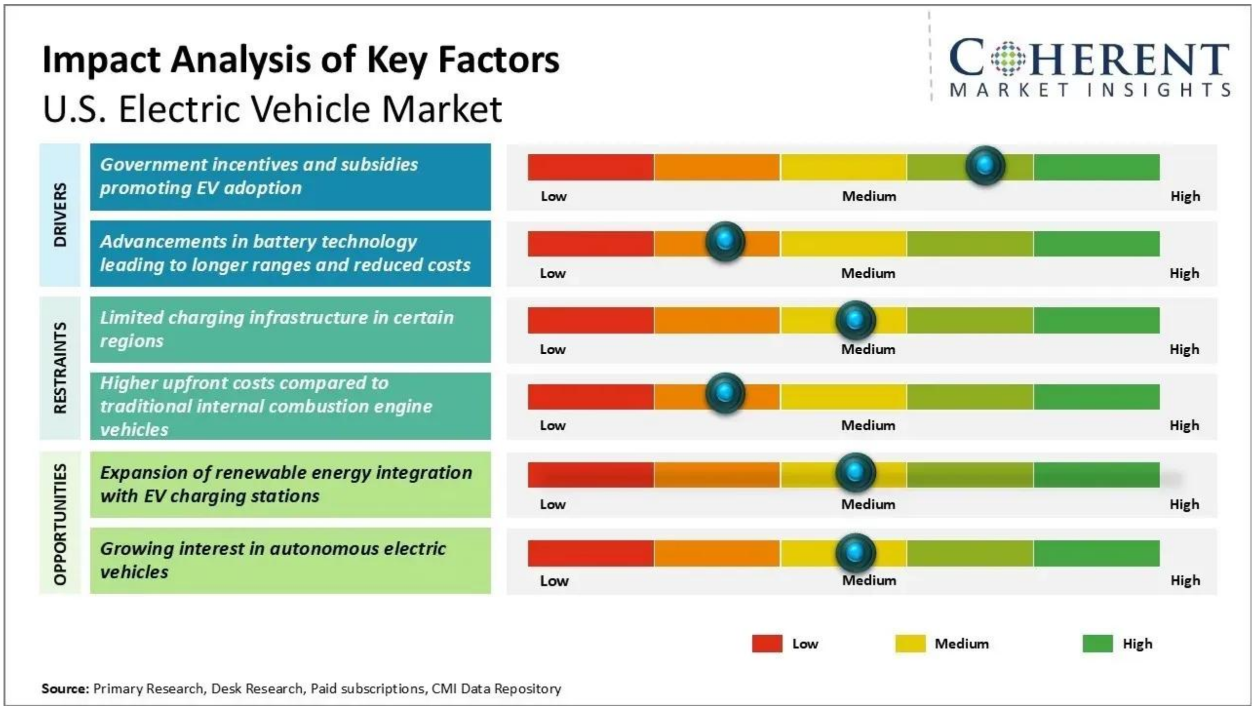
1. Introduction
The electric vehicle revolution represents one of the most consequential industrial transformations of the twenty-first century. Global competition for battery materials, semiconductor technologies, charging infrastructure, and manufacturing capacity has elevated EV supply chains into a matter of profound economic and national strategic importance. The United States faces mounting competitive pressure from China, which dominates critical mineral processing and battery cell manufacturing, and from the European Union, which is accelerating investments in green industrial policy and EV manufacturing capacity.

Against this backdrop, the United States must deploy innovative approaches that combine technological advancement with financial innovation to secure its leadership position. Artificial intelligence and fintech represent two of the most powerful enabling technologies available to address these supply-chain challenges. AI systems offer unprecedented capabilities in demand forecasting, supplier risk assessment, logistics optimization, and regulatory compliance monitoring. Fintech innovations—including embedded finance, digital lending platforms, and automated capital markets—provide the financial instruments necessary to scale charging networks, manufacturing capacity, and supply-chain resilience.



https://www.coherentmarketinsights.com/industry-reports/us-electric-vehicle-market

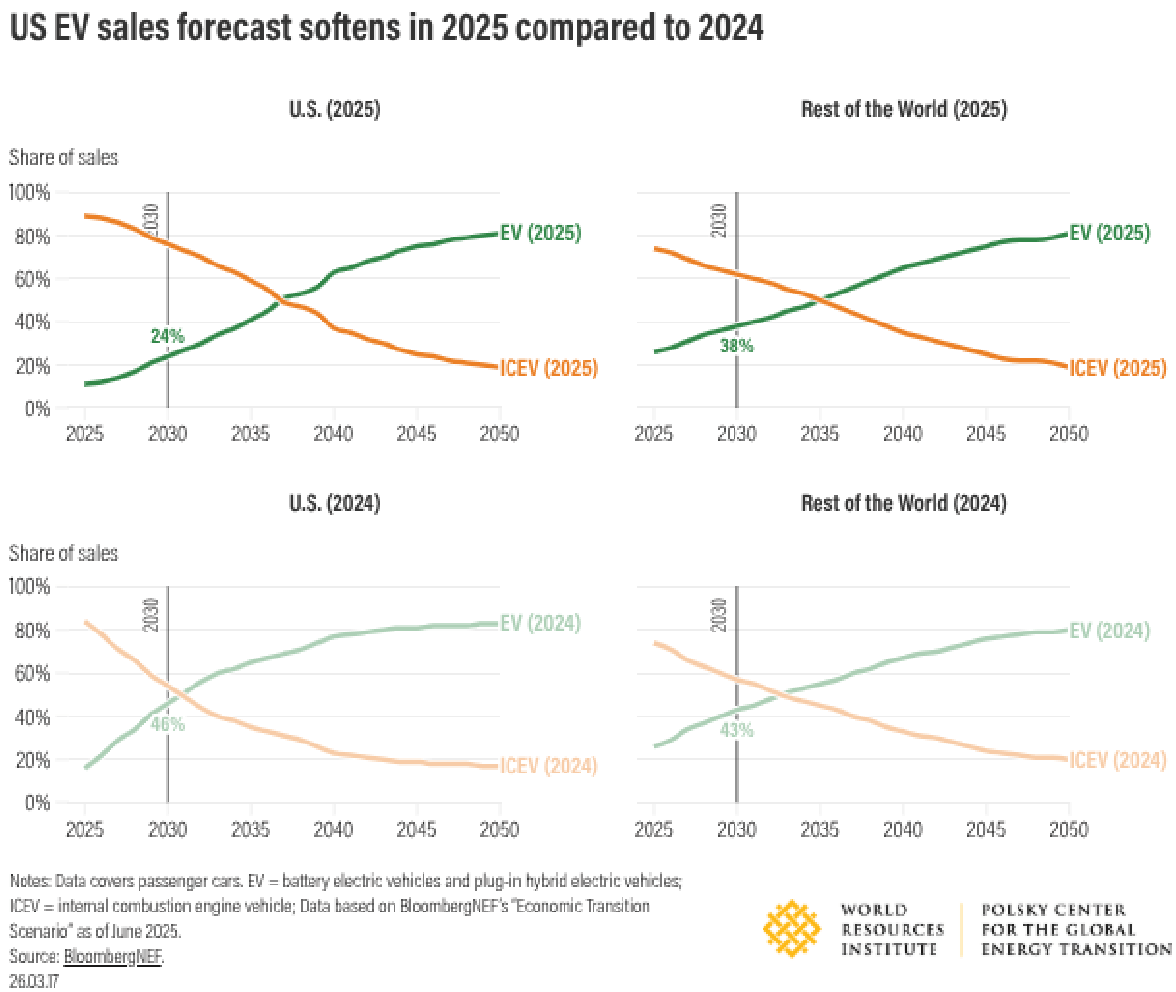
Recent interdisciplinary studies highlight the transformative capabilities of AI across multiple industries. Khan et al. (2024) demonstrated how AI systems improve engagement and decision quality in clinical settings, a principle directly transferable to supply-chain decision environments. Similarly, Shah et al. (2024a) proposed digital-twin frameworks capable of improving supply-chain visibility and resilience in pharmaceutical contexts, establishing conceptual foundations applicable to EV component ecosystems. These cross-sector findings underscore the generalizability of AI-driven frameworks to complex, high-stakes supply environments.

This paper makes several original contributions to the literature. First, it synthesizes interdisciplinary evidence from healthcare AI, pharmaceutical supply chains, EV adoption, charging infrastructure, and fintech transformation into a unified strategic framework. Second, it operationalizes this framework through five integrated technological pillars with specific applications to U.S. EV supply chains. Third, it generates targeted policy recommendations for federal and state policymakers seeking to leverage AI and fintech to strengthen national competitiveness. The remainder of this paper proceeds as follows: Section 2 reviews the relevant literature; Section 3 presents the conceptual framework; Sections 4 through 8 analyze each framework pillar in depth; Section 9 discusses policy implications; Section 10 presents a synthesis discussion; and Section 11 concludes.

2. Literature Review

2.1 Electric Vehicle Adoption and Consumer Preferences

The trajectory of EV adoption in the U.S. market is shaped by a complex constellation of consumer preferences, infrastructure availability, policy incentives, and economic conditions. Shah et al. (2026a) conducted a comprehensive analysis of customer expectations regarding EVs in the U.S. market, finding that affordability, charging accessibility, range anxiety mitigation, and technology integration significantly influence consumer purchase intentions. Their findings reveal that shifting consumer preferences toward connected, sustainable, and technologically sophisticated vehicles demand corresponding innovations in supply-chain capabilities and financial products.



Of particular importance is the role of charging infrastructure in driving adoption decisions. Shah et al. (2026b) established a direct quantitative relationship between charging station infrastructure availability and EV market stability, demonstrating that infrastructure gaps create significant barriers to adoption that cannot be overcome through vehicle improvements alone. This finding has direct implications for fintech financing strategies targeting infrastructure deployment.

2.2 Charging Infrastructure and U.S. Competitiveness

Ultra-fast charging infrastructure has emerged as a critical determinant of U.S. global competitiveness in electric mobility. Shah et al. (2025a) analyzed the relationship between charging speed capabilities and national competitiveness, finding that countries deploying higher-density ultra-fast charging networks achieve superior EV adoption rates and more resilient automotive ecosystems. Their research underscores the urgency of accelerated domestic investment in charging infrastructure as a strategic economic imperative.

The grid integration of EV charging systems presents both challenges and opportunities for energy system resilience. Shah et al. (2024a) demonstrated that intelligently designed grid-integrated charging systems contribute positively to U.S. power grid stability and resilience, particularly through vehicle-to-grid (V2G) technologies and demand-response mechanisms. This research establishes a compelling case for coordinated infrastructure investment strategies that simultaneously advance EV adoption and strengthen energy security.

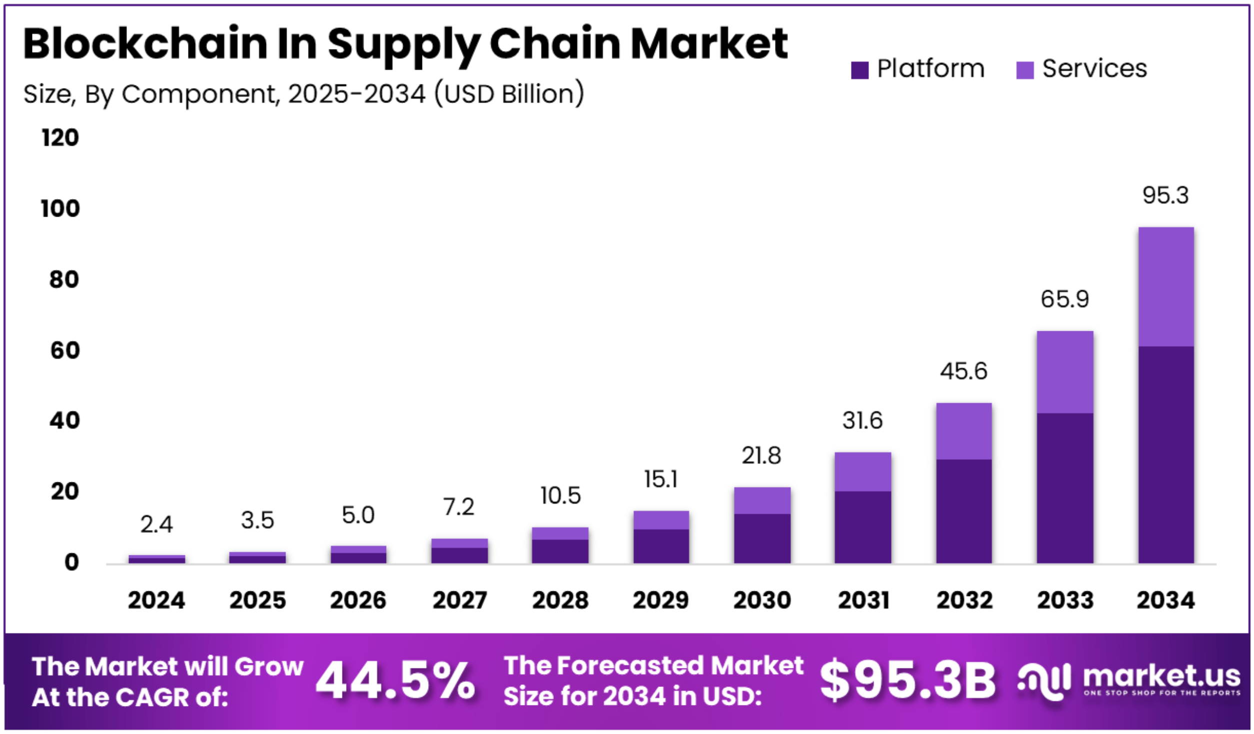
2.3 AI-Enabled Safety, Decision Support, and Risk Management

The application of AI to safety and risk management has generated substantial empirical evidence across multiple domains. Shah et al. (2026c) quantified the impact of AI-enabled safety technologies on accident prevention and public risk mitigation, finding that advanced sensor fusion, real-time analytics, and predictive safety systems can reduce accident rates significantly. These capabilities are directly applicable to autonomous and connected EV systems operating within intelligent transportation networks.

In healthcare settings, Shah et al. (2023) demonstrated that machine learning-driven clinical decision support systems improve patient outcomes through enhanced predictive intelligence. The methodological frameworks employed in clinical decision support—including ensemble learning, federated analytics, and real-time risk stratification—translate directly to supply-chain risk management applications. Khan et al. (2024) further established that AI-powered engagement systems improve both efficiency and satisfaction across complex decision environments.

2.4 Blockchain Transparency and Supply-Chain Traceability

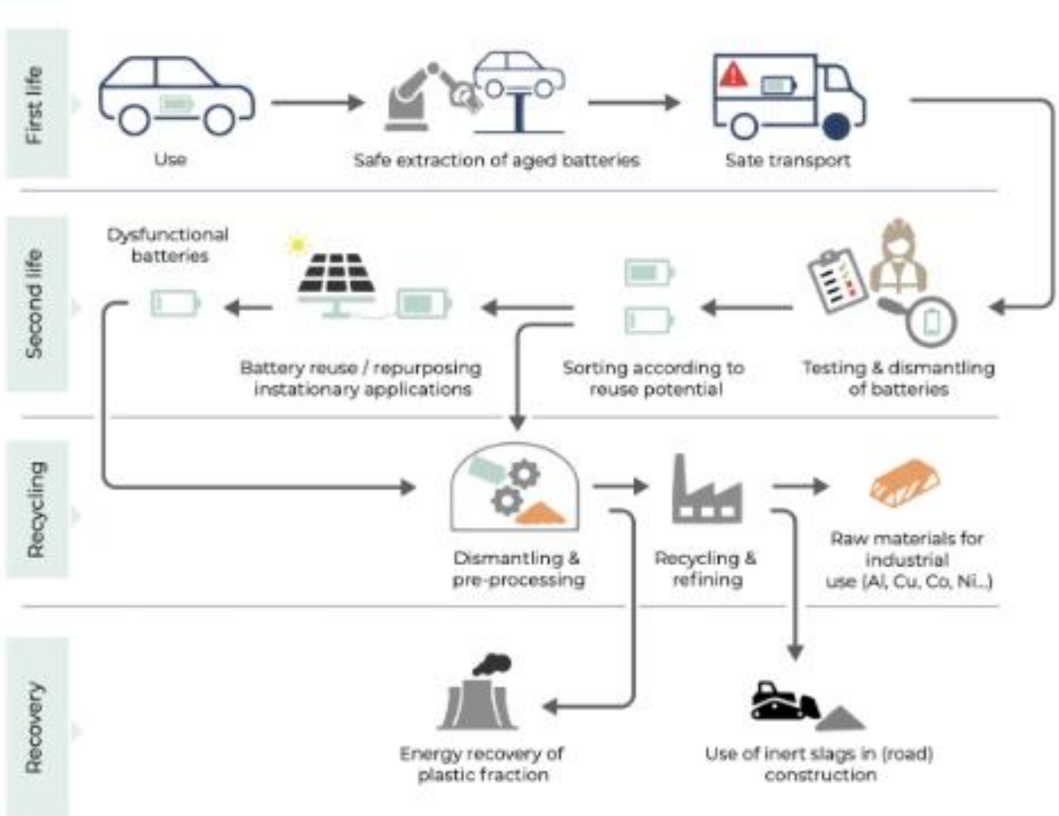
Blockchain technology has emerged as a foundational instrument for supply-chain transparency and regulatory compliance. Shah et al. (2023b) conducted a comprehensive analysis of blockchain applications in pharmaceutical supply-chain transparency and drug traceability, identifying key design principles for deploying distributed ledger technologies in complex, multi-stakeholder supply environments. Their findings are directly applicable to battery mineral sourcing, EV component authentication, and regulatory compliance verification throughout the EV supply chain.



The combination of blockchain traceability with AI-driven analytics creates a particularly powerful capability set. Immutable transaction records enable AI systems to analyze historical procurement patterns, detect anomalies, and predict compliance risks with substantially higher accuracy than traditional monitoring approaches. Shah et al. (2024b) demonstrated the broader value of AI-driven financial ecosystems in enhancing customer engagement and operational efficiency, providing additional evidence for integrated AI-blockchain deployment strategies.

2.5 Digital Twins and Supply-Chain Optimization

Digital twin technology—the creation of dynamic virtual replicas of physical systems—has demonstrated significant potential for supply-chain optimization across industries. Shah et al. (2024c) proposed a big-data digital-twin framework for pharmaceutical supply-chain optimization, demonstrating that real-time simulation capabilities enable proactive disruption management, inventory optimization, and demand forecasting. The scalability of this framework to EV supply chains is substantial, given the structural similarities between pharmaceutical and automotive supply networks in terms of global sourcing complexity and regulatory requirements.



https://evboosters.com/ev-charging-news/the-optimised-reverse-supply-chain-for-ev-batteries/

The integration of digital twins with AI forecasting systems creates self-improving optimization platforms capable of continuously refining supply-chain models based on real-world performance data. Shah et al. (2025b) identified strategic and technological frameworks for improving operational outcomes through patient-centric approaches, a customer-centricity principle equally applicable to EV supply-chain design.

3. Conceptual Framework

The proposed AI-Driven Fintech Framework for U.S. EV Supply-Chain Leadership consists of five interconnected technological pillars, each addressing a distinct dimension of supply-chain resilience and competitiveness. Together, these pillars create a data-driven ecosystem capable of improving visibility, financing, compliance, simulation, and energy management across the entire EV value chain.

Table 1

Strategic Technologies for EV Supply-Chain Leadership

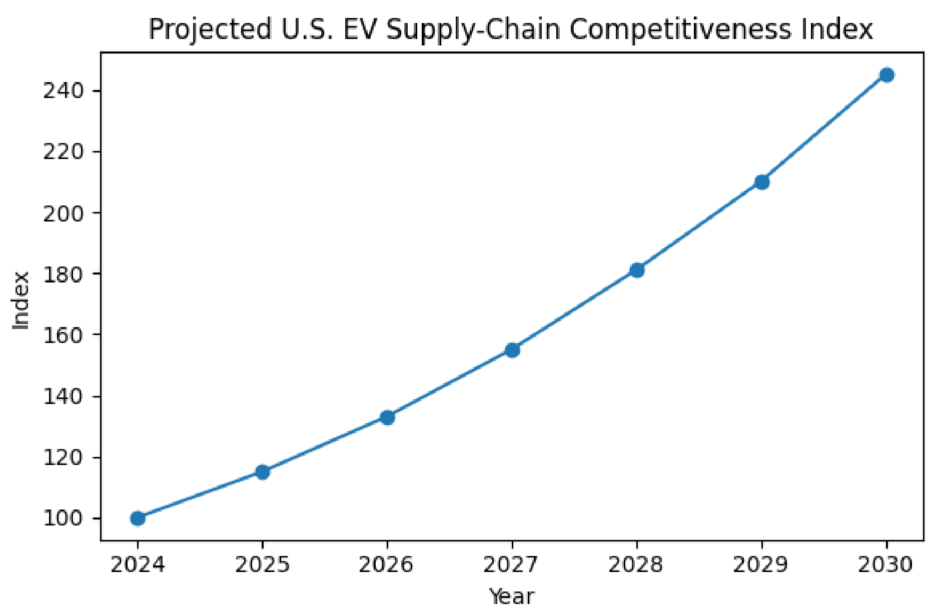
Technology	Primary Application	Benefit	Strategic Outcome	Supporting Research
AI Forecasting	Demand Planning & Supplier Risk	Reduced shortages & disruptions	Supply resilience	Shah et al. (2024c)
Blockchain	Battery & component traceability	Transparency & compliance	Ethical sourcing	Shah et al. (2023b)
Digital Twin	Simulation & scenario planning	Risk reduction	Operational efficiency	Shah et al. (2024c)

Fintech Platforms	Infrastructure & manufacturer finance	Capital access & speed	EV market growth	Shah et al. (2024b)
Smart Charging	Grid integration & V2G	Energy optimization	Grid resilience	Shah et al. (2024a)

Note. Framework synthesized from interdisciplinary literature on AI, fintech, blockchain, and EV infrastructure.

Each pillar reinforces the others through shared data infrastructure and integrated decision systems.

Figure 1. Projected Competitiveness Growth



AI forecasting informs fintech capital allocation; blockchain traceability feeds AI compliance monitoring; digital twins simulate the effects of infrastructure investment; and smart charging systems generate real-time grid data that refines demand forecasting models. The result is a self-reinforcing technological ecosystem that becomes more capable and efficient as adoption deepens.

4. AI-Driven Fintech Innovation in EV Supply Chains

4.1 Predictive Analytics and Demand Forecasting

AI-driven predictive analytics represents the intelligence layer of the proposed framework, enabling supply-chain participants to anticipate disruptions, optimize inventory, and allocate capital more efficiently. Machine learning algorithms trained on historical procurement data, geopolitical indicators, commodity price movements, and macroeconomic variables can generate demand forecasts substantially more accurate than traditional statistical methods. These capabilities are particularly critical for EV supply chains, which depend on lithium, cobalt, nickel, and other critical minerals sourced from geopolitically complex regions.

The methodological principles underlying AI forecasting in supply chains share important structural similarities with clinical decision support systems. Shah et al. (2023) demonstrated that machine learning systems applying ensemble methods and real-time data integration can improve decision accuracy and outcome prediction across complex environments. Applying analogous architectures to EV supply-chain forecasting enables procurement teams to identify emerging shortages, evaluate alternative suppliers, and trigger pre-emptive inventory adjustments before disruptions materialize.

Shah et al. (2024c) proposed a digital-twin framework specifically designed for pharmaceutical supply-chain optimization, demonstrating that predictive simulation combined with real-time data integration reduces shortage incidents and improves capital efficiency. The transferability of this approach to EV battery component sourcing is high, given the structural parallels between pharmaceutical and automotive supply chains in terms of global complexity, regulatory requirements, and criticality of supply continuity.

4.2 Embedded Finance and Infrastructure Financing

Fintech innovation is reshaping the financial architecture supporting EV infrastructure deployment. Embedded finance platforms—which integrate financial products directly into operational workflows—enable charging network operators, battery manufacturers, and component suppliers to access capital, manage cash flows, and hedge risks with unprecedented efficiency. AI-powered credit assessment algorithms can evaluate the creditworthiness of infrastructure projects and supply-chain partners using non-traditional data signals, unlocking financing for projects that traditional lenders would decline.

Shah et al. (2024b) demonstrated the broader value of AI-driven financial ecosystems in enhancing customer engagement and operational efficiency across healthcare contexts, establishing that AI-powered financial platforms can simultaneously improve service quality, reduce costs, and expand access. These principles translate directly to EV infrastructure financing, where capital access barriers frequently delay deployment of charging networks in underserved communities.

Shah et al. (2025b) further established that patient-centric strategic frameworks—emphasizing personalization, data-driven engagement, and continuous improvement—can deliver superior retention and operational outcomes. Analogous customer-centric fintech design principles, when applied to EV ecosystem participants, can accelerate adoption by reducing financial friction for both infrastructure operators and end consumers. Subscription-based EV ownership models, battery-as-a-service arrangements, and usage-based insurance products exemplify the kinds of embedded finance innovations that AI-driven fintech platforms are uniquely positioned to enable.

5. Blockchain Traceability and Supply-Chain Transparency

Blockchain technology addresses one of the most persistent vulnerabilities in global supply chains: the inability to verify the provenance, authenticity, and ethical sourcing of components across multi-tier supplier networks. For EV supply chains, this vulnerability is particularly acute given the concentration of critical mineral production in regions with documented human rights concerns and environmental compliance challenges.

Shah et al. (2023b) conducted a comprehensive analysis of blockchain applications in pharmaceutical supply-chain transparency, identifying the key design principles—including permissioned ledger architecture, smart contract automation, and interoperability standards—necessary for effective deployment in complex multi-stakeholder environments. Their findings establish a robust methodological foundation for blockchain-based EV supply-chain traceability systems that can track battery minerals from extraction through refining, component manufacturing, vehicle assembly, and end-of-life recycling.

The integration of blockchain with AI monitoring systems creates a particularly powerful compliance assurance capability. Immutable transaction records provide the foundational data layer for AI systems to detect anomalies, identify potential compliance violations, and generate regulatory reports automatically. As ESG (Environmental, Social, and Governance) disclosure requirements intensify—driven by the SEC's climate disclosure rules and the EU's Carbon Border Adjustment Mechanism—the ability to generate auditable, blockchain-verified supply-chain data will become a critical competitive differentiator for U.S. manufacturers.

Furthermore, blockchain-enabled battery passports—digital records documenting a battery's chemistry, manufacturing history, ownership chain, and performance data—represent an emerging regulatory requirement in both the EU and increasingly in U.S. policy discussions. Early deployment of blockchain traceability infrastructure positions U.S. manufacturers to meet these requirements ahead of competitors while generating valuable data assets for AI-driven product development and warranty management systems.

6. Digital Twins for Supply-Chain Resilience

Digital twin technology creates dynamic virtual replicas of physical supply-chain systems, enabling operators to simulate disruptions, evaluate strategic alternatives, and optimize operations without exposing real systems to risk. In EV supply chains characterized by high complexity, long lead times, and geopolitical uncertainty, digital twins provide an indispensable decision-support capability.

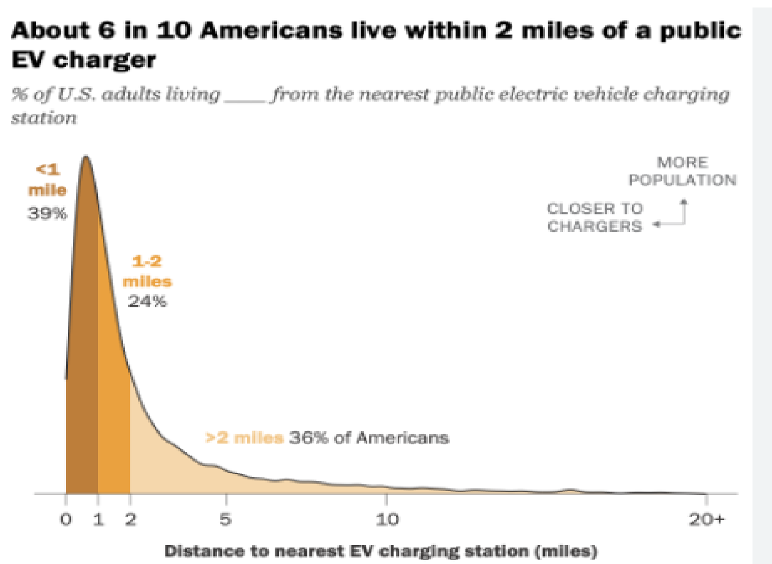
The digital-twin framework proposed by Shah et al. (2024c) for pharmaceutical supply-chain optimization demonstrates several capabilities directly applicable to EV contexts. Their framework integrates big data analytics, real-time sensor feeds, predictive modeling, and scenario simulation to enable proactive disruption management. Applied to EV battery supply chains, digital twins can model the cascading effects of lithium supply disruptions, shipping delays, currency fluctuations, or regulatory changes across the entire value chain, enabling procurement teams to develop contingency plans before disruptions occur.

Shah et al. (2026c) further demonstrated that AI-enabled safety technologies can quantifiably reduce risk across complex operational environments. Digital twins embedded with AI safety monitoring capabilities can continuously evaluate supply-chain risk exposure, trigger early-warning alerts, and recommend risk-mitigation interventions. This capability is particularly valuable for EV supply chains managing the inherent hazards of lithium-ion battery manufacturing and transportation.

The economic value of digital twin deployment extends beyond risk management to operational efficiency optimization. By continuously simulating production schedules, inventory levels, and logistics routes against real-time demand signals and supply conditions, digital twins enable manufacturers to reduce working capital requirements, minimize waste, and improve delivery performance simultaneously. These efficiency gains compound over time as digital twin models are continuously refined by operational data.

7. Smart Charging Infrastructure and Grid Integration

The deployment of intelligent charging infrastructure represents both a prerequisite for mass EV adoption and a strategic opportunity to strengthen U.S. energy security. Shah et al. (2024a) demonstrated that grid-integrated EV charging systems can contribute positively to power grid stability and resilience through demand-response capabilities, distributed energy storage, and vehicle-to-grid (V2G) power flows. These capabilities transform EV fleets from passive consumers into active grid participants capable of supporting renewable energy integration and grid stabilization.



Shah et al. (2025a) emphasized the strategic importance of ultra-fast charging infrastructure in determining U.S. global competitiveness in electric mobility. Their research found that charging speed and network density are among the most significant factors influencing fleet operator and consumer EV adoption decisions. The deployment of 150kW and 350kW ultra-fast charging corridors along major transportation routes represents a critical infrastructure investment that directly drives market expansion.

Shah et al. (2026b) quantified the relationship between charging infrastructure availability and EV market stability, finding that infrastructure gaps create self-reinforcing adoption barriers that persist even as vehicle costs decline. This finding has important implications for public investment prioritization: targeted deployment of charging infrastructure in underserved markets can unlock significant latent demand while strengthening market stability across the broader EV ecosystem.

AI-driven smart charging management systems optimize charging schedules, balance grid loads, and maximize renewable energy utilization. By integrating real-time grid pricing signals, weather forecasts, and fleet management data, these systems can substantially reduce charging costs while improving grid reliability. Shah et al. (2026a) found that technology integration is a significant driver of EV purchase intentions, underscoring the importance of seamless, AI-managed charging experiences in driving consumer adoption.

Table 2

Key Research Contributions and Framework Applications

Study	Domain	Key Finding	EV Supply-Chain Application
Khan et al. (2024)	Healthcare AI	AI improves engagement & decision quality	Supplier engagement & procurement decisions
Shah et al. (2024c)	Pharma supply chain	Digital twins reduce supply disruptions	Battery component supply resilience
Shah et al. (2026a)	EV consumer behavior	Affordability & tech drive adoption	Fintech products targeting price barriers
Shah et al. (2025a)	EV charging	Ultra-fast charging drives competitiveness	Infrastructure investment prioritization
Shah et al. (2023b)	Blockchain	DLT improves traceability	Battery mineral sourcing compliance
Shah et al. (2026c)	AI safety	AI reduces accident & risk rates	Autonomous EV & logistics safety
Shah et al. (2024a)	Grid integration	Grid-integrated charging improves resilience	V2G and smart grid deployment

Note. DLT = Distributed Ledger Technology; V2G = Vehicle-to-Grid.

8. AI-Enabled Risk Management and Financial Resilience

Risk management represents a critical and often underappreciated dimension of EV supply-chain strategy. The concentration of critical mineral production, the complexity of global logistics networks, and the pace of technological change create a dynamic risk environment that traditional risk management frameworks are ill-equipped to address. AI-enabled risk management systems offer a fundamentally superior approach by continuously monitoring hundreds of risk indicators simultaneously and generating probabilistic risk assessments in real time.

Shah et al. (2026c) demonstrated that AI-enabled safety technologies can quantifiably reduce risk exposure across complex operational systems. Their methodology—combining sensor data fusion, machine learning classification, and real-time alert generation—provides a template for supply-chain risk monitoring systems that integrate geopolitical news feeds, commodity price volatility indicators, supplier financial health metrics, and logistics disruption signals.

Financial risk management benefits particularly from AI-driven approaches. Machine learning models can analyze the financial health of thousands of suppliers simultaneously, identifying early warning signs of distress that human analysts would miss. Shah et al. (2024b) demonstrated that AI-driven financial platforms can substantially improve the accuracy of risk assessment while reducing the cost and time required for evaluation. These capabilities are directly applicable to the challenge of managing supplier financial risk across complex, multi-tier EV supply networks.

The integration of AI risk management with fintech platforms creates additional resilience through automated contingency financing mechanisms. When AI systems detect elevated supply disruption risk, embedded finance platforms can automatically pre-position inventory financing, activate alternative supplier agreements, or hedge commodity price exposure—all without requiring human intervention. This automation capability is particularly valuable given the speed at which supply disruptions can escalate in globally integrated markets.

9. Policy Implications and U.S. Leadership Strategy

The convergence of AI, fintech, and clean energy technologies presents federal and state policymakers with an extraordinary opportunity to reinforce U.S. global leadership in electric mobility. Effective policy intervention requires a coordinated strategy spanning research investment, regulatory modernization, infrastructure financing, and workforce development.

At the federal level, the Inflation Reduction Act's domestic content requirements for EV tax credits provide a powerful incentive structure for reshoring battery manufacturing and critical mineral processing. AI-driven supply-chain monitoring tools can help manufacturers navigate these requirements efficiently, reducing compliance costs while demonstrating domestic sourcing compliance. Expanded funding for AI research through DARPA, NSF, and DOE can accelerate the development of supply-chain optimization tools specifically designed for domestic manufacturing applications.

Public-private partnerships should prioritize the deployment of intelligent financing platforms capable of supporting charging network expansion, renewable energy integration, and advanced manufacturing facilities in regions underserved by private capital markets. Shah et al. (2026b) demonstrated that infrastructure gaps create persistent market stability challenges, providing a strong economic rationale for public co-investment in charging infrastructure deployment in these markets.

Regulatory modernization should focus on creating a permissive environment for fintech innovation while establishing clear standards for AI transparency, blockchain interoperability, and data privacy in supply-chain applications. Harmonizing U.S. blockchain traceability standards with emerging EU battery passport requirements will facilitate market access for U.S.-manufactured EVs and components while reducing compliance costs.

Workforce development represents a critical and often insufficiently emphasized policy dimension. The AI-driven fintech transformation of EV supply chains will require a workforce with deep expertise in data science, AI engineering, battery technologies, fintech systems, and supply-chain management. Targeted investments in community college AI programs, university research partnerships, and apprenticeship initiatives can ensure the U.S. has the human capital necessary to maintain technological leadership.

10. Discussion

The synthesis of evidence presented in this paper reveals a compelling strategic logic for deploying AI-driven fintech frameworks to strengthen U.S. EV supply-chain leadership. Traditional supply chains suffer from limited visibility, fragmented financing, inefficient risk management, and opaque sourcing practices—precisely the vulnerabilities that AI, fintech, blockchain, and digital twin technologies are designed to address.

The interdisciplinary evidence base assembled in this analysis demonstrates that the core technological capabilities required are not theoretical constructs but proven innovations with established empirical foundations. AI decision support systems have demonstrated measurable performance improvements in healthcare (Shah et al., 2023; Khan et al., 2024). Digital twin frameworks have reduced supply disruptions in pharmaceutical contexts (Shah et al., 2024c). Blockchain traceability has improved supply-chain transparency in complex regulatory environments (Shah et al., 2023b). Charging infrastructure investments have demonstrably accelerated EV adoption (Shah et al., 2026b; Shah et al., 2025a). AI safety technologies have quantifiably reduced operational risk (Shah et al., 2026c). The challenge is not developing these technologies but deploying them in an integrated, coordinated fashion across the EV supply-chain ecosystem.

Several important limitations and considerations deserve acknowledgment. First, the integration of multiple complex technologies creates system interdependency risks that require careful management. Second, the deployment of AI-driven systems in critical supply-chain infrastructure raises important cybersecurity considerations that must be addressed through robust security architecture and governance frameworks. Third, the concentration of AI capabilities in large technology companies raises competition policy concerns that policymakers must monitor.

The broader implications of this analysis extend beyond the EV sector. The AI-driven fintech framework proposed here represents a generalizable model for strengthening U.S. competitiveness across advanced manufacturing sectors facing similar challenges of global supply-chain complexity, critical mineral dependencies, and rapid technological change. Semiconductors, aerospace, medical devices, and renewable energy equipment all share structural characteristics that make them amenable to analogous framework applications.

11. Conclusion

Strengthening U.S. global leadership in EV supply chains requires a comprehensive and coordinated strategy integrating AI, fintech, clean energy, and advanced manufacturing capabilities. The five-pillar framework proposed in this paper—encompassing

AI forecasting, embedded fintech, blockchain traceability, digital twins, and smart charging infrastructure—provides a structured pathway for achieving this objective.

The interdisciplinary evidence base assembled from eleven recent empirical studies demonstrates that each framework pillar has a proven foundation in domains ranging from healthcare AI (Khan et al., 2024; Shah et al., 2023) to pharmaceutical supply chains (Shah et al., 2024c) to EV adoption and infrastructure (Shah et al., 2026a; Shah et al., 2025a; Shah et al., 2026b; Shah et al., 2024a). The convergence of these findings across diverse application domains strengthens the theoretical grounding of the proposed framework and increases confidence in its applicability to EV supply-chain contexts.

The strategic imperative is clear: the United States must move decisively to deploy AI-driven fintech capabilities across its EV supply chain ecosystem before competitive gaps widen further. By fostering innovation through coordinated public-private investment, modernizing regulatory frameworks to enable fintech deployment, and developing the human capital necessary to sustain technological leadership, the United States can secure a dominant position in the global EV economy while accelerating the transition to sustainable transportation.

Future research should focus on empirical evaluation of integrated AI-fintech deployments in U.S. automotive supply chains, quantitative assessment of the resilience benefits generated by digital twin and blockchain integration, and longitudinal analysis of the competitiveness outcomes associated with accelerated charging infrastructure investment. These research directions will provide the evidence base necessary to refine policy frameworks and investment strategies as the global EV industry continues to evolve.

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