

Strategic Decision-Making Models Using Artificial Intelligence In The Electric Vehicle Industry: A Systematic Literature Review And Bibliometric Analysis

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Abstract

The rapid growth of the electric vehicle (EV) industry has increased the complexity of strategic decision-making related to production planning, resource allocation, technology investment, and sustainability. Artificial Intelligence (AI) has become an important enabler of data-driven decision-making through machine learning, predictive analytics, decision support systems, and optimization techniques. However, existing studies remain fragmented and primarily focus on specific applications rather than integrated strategic frameworks. This study systematically reviews and maps the development of AI-enabled strategic decision-making research in the EV industry using a combination of Systematic Literature Review (SLR) and bibliometric analysis. Following the PRISMA 2020 guidelines, 32 relevant studies were selected from Scopus, ScienceDirect, and SpringerLink. The findings identify three dominant research streams: AI-based decision support systems, predictive analytics and engineering decision-making, and fuzzy logic and optimization models. The study highlights the lack of an integrated framework and proposes an Input–Process–Output (IPO)-based conceptual framework to support strategic decision-making and sustainable development in the EV industry

Keywords: Artificial Intelligence, Strategic Decision-Making, Electric Vehicle Industry, Systematic Literature Review, Bibliometric Analysis.



INTRODUCTION

The rapid growth of the electric vehicle (EV) industry has increased the complexity of strategic decision-making related to production planning, resource allocation, technology investment, and sustainable development. Advances in battery technology, charging infrastructure, renewable energy integration, and intelligent transportation systems have further strengthened the strategic importance of EVs. In response to these challenges, Artificial Intelligence (AI) has emerged as a key enabler of data-driven decision-making through Machine Learning, Deep Learning, Decision Support Systems, and Predictive Analytics. These technologies help organizations improve forecasting accuracy, optimize operational performance, evaluate strategic alternatives, and enhance competitiveness in dynamic business environments. Furthermore, AI contributes to sustainability by supporting efficient resource utilization, battery lifecycle management, renewable energy integration, and environmentally responsible business practices.

Existing studies have extensively examined individual applications of AI, Predictive Analytics, Fuzzy Logic, and Optimization Models in the EV industry, particularly in areas such as battery management, charging optimization, demand forecasting, and energy scheduling. However, most research remains fragmented and focuses on specific operational issues rather than integrated strategic decision-making frameworks. To address this gap, this study investigates the relationships among Predictive Analytics, Engineering Decision Making, Fuzzy Logic, and Optimization Models through a Systematic Literature Review (SLR) and bibliometric analysis. The study aims to identify research trends, synthesize existing knowledge, and develop a comprehensive conceptual framework that supports AI-enabled strategic decision-making and sustainable development in the electric vehicle industry.

LITERATURE REVIEW

Artificial Intelligence (AI) has become a key technology for supporting strategic decision-making by enabling organizations to analyze large volumes of data, identify patterns, and generate predictive insights. Through approaches such as Machine Learning (ML), Deep Learning, and AI-based Decision Support Systems (DSS), organizations can improve forecasting accuracy, optimize operations, and evaluate strategic alternatives more effectively. In the electric vehicle (EV) industry, AI plays an important role in production planning, supply chain management, battery technology development, energy optimization, and market analysis. As the EV industry faces rapid technological changes, increasing competition, and sustainability challenges, AI provides

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organizations with enhanced capabilities to improve decision quality, operational efficiency, and long-term competitiveness.

Predictive Analytics, Engineering Decision Making (EDM), Fuzzy Logic, and Optimization Models further strengthen AI-enabled strategic decision-making. Predictive Analytics techniques such as SARIMA and LSTM support demand forecasting and future planning, while EDM evaluates alternatives based on technical, economic, and operational considerations. Capacity analysis, bottleneck identification, trade-off analysis, and sensitivity analysis contribute to more robust decision-making processes. Furthermore, the integration of Fuzzy Logic and Optimization Models helps organizations manage uncertainty and identify optimal strategic alternatives by balancing multiple objectives, including profitability, risk, and flexibility. Together, these approaches provide a comprehensive framework for supporting sustainable and data-driven strategic decision-making in the EV industry.

RESEARCH METHODOLOGY

Research Design

This study employs a Systematic Literature Review (SLR) and bibliometric analysis approach to identify, evaluate, and map the development of research related to the application of Artificial Intelligence in strategic decision-making within the electric vehicle industry. This approach was selected because it provides both a systematic synthesis of the existing literature and a quantitative overview of research trends, dominant themes, conceptual relationships, and future research directions.

The Systematic Literature Review method is used to collect and analyze relevant scientific publications based on a structured and replicable procedure. Bibliometric analysis is conducted to evaluate publication characteristics, collaboration patterns, keyword relationships, and thematic developments associated with Artificial Intelligence, Predictive Analytics, Engineering Decision Making, Fuzzy Logic, and Strategic Decision-Making in the electric vehicle industry.

The study follows the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines, consisting of identification, screening, eligibility assessment, and inclusion stages.

Research Framework

This study adopts the Input–Process–Output (IPO) framework as a conceptual foundation for integrating the major concepts identified in the literature. The framework is

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used to classify studies based on the relationships among input data, Artificial Intelligence-based analytical processes, and strategic decision outputs.

The input component consists of historical sales data, production data, production capacity, inventory levels, production costs, available resources, and production lead times that serve as the basis for decision-making. The process component includes Predictive Analytics, Engineering Decision Making, Fuzzy Logic, and Optimization Models to generate optimal strategic alternatives. The output component represents strategic decisions that consider profitability, risk, and flexibility within the dynamic and uncertain environment of the electric vehicle industry.

The IPO framework serves as a foundation for article classification, concept mapping, and the development of the conceptual model generated through the literature synthesis process.

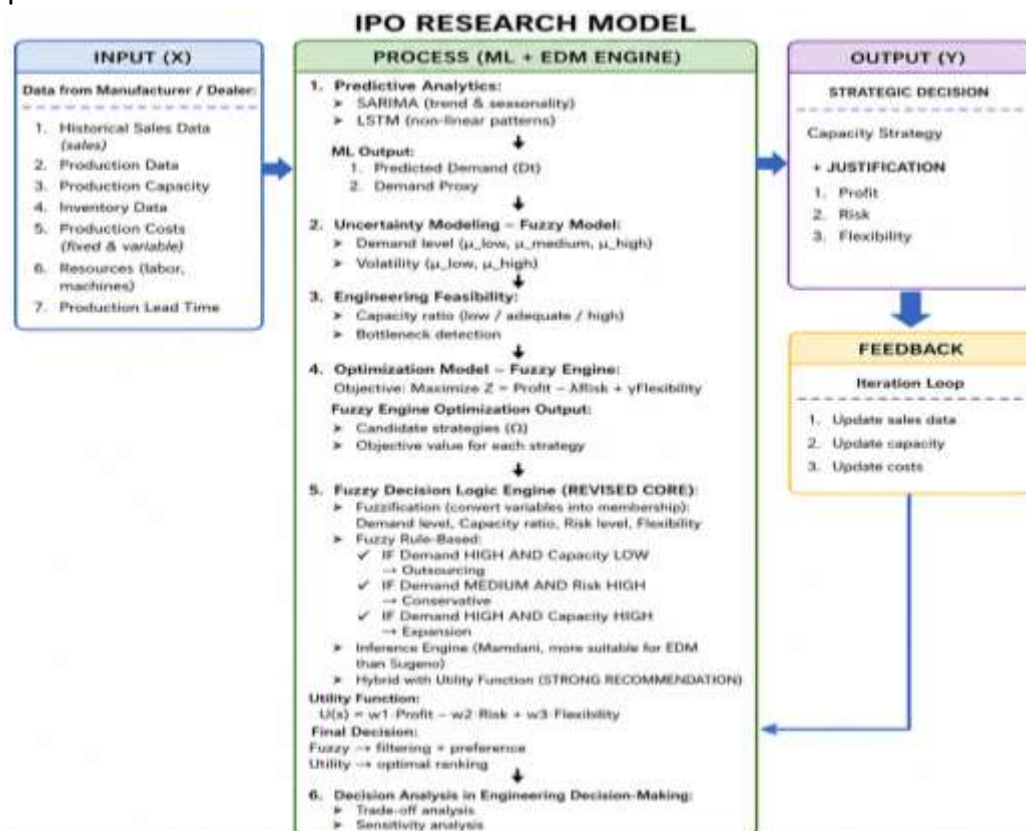


Figure 1. Input–Process–Output (IPO)-Based Research Framework

Data Sources and Literature Search Strategy

The study utilizes scientific publications obtained from three major international databases: Scopus, ScienceDirect, and SpringerLink. These databases were selected due to their extensive coverage of publications related to Artificial Intelligence, decision support systems, predictive analytics, and the electric vehicle industry.

The literature search was conducted using combinations of keywords adapted to the characteristics of each database. The search strategy was designed to capture studies discussing Artificial Intelligence applications in strategic decision-making within the context of electric vehicles and electric mobility.

The initial search identified 102 articles from Scopus, 378 articles from ScienceDirect, and 76 articles from SpringerLink, resulting in a total of 556 records.

The literature search was conducted between January and February 2026. Therefore, only publications indexed in the selected databases up to February 2026 were considered for inclusion. Articles published after the search completion date were not included in the review to ensure consistency and reproducibility of the selection process.

Table 1. Literature Search Strategy

Database	Search String
Scopus	TITLE-ABS-KEY(("artificial intelligence" OR "machine learning" OR "deep learning") AND ("strategic decision making" OR "decision support system") AND ("electric vehicle" OR "electric vehicles"))
ScienceDirect	("artificial intelligence" OR "machine learning" OR "deep learning") AND ("strategic decision making" OR "decision support system") AND ("electric vehicle" OR "electric vehicles")
SpringerLink	("strategic decision making" OR "decision support system") AND ("electric vehicle" OR "electric mobility") AND ("artificial intelligence" OR "machine learning" OR "predictive analytics" OR "fuzzy logic")

Table 2. Article Identification Results Based on Database

Database	Number of Articles
Scopus	102
ScienceDirect	378
SpringerLink	76
Total	556



Inclusion and Exclusion Criteria

Inclusion criteria were established to ensure the relevance of selected studies to the objectives of this review. Published between January 2012 and February 2026 and indexed in Scopus, ScienceDirect, or SpringerLink at the time of the literature search. Articles were included if they met the following criteria:

1. Published in peer-reviewed international journals.
2. Related to Artificial Intelligence, Machine Learning, Deep Learning, Predictive Analytics, Fuzzy Logic, or Decision Support Systems.
3. Addressed strategic decision-making or engineering decision-making issues.
4. Associated with the electric vehicle industry or electric mobility.
5. Written in English.
6. Available in full-text format.

The exclusion criteria were as follows:

1. Duplicate articles identified across multiple databases.
2. Articles unavailable in full-text format.
3. Editorials, non-scientific publications, and irrelevant reports.
4. Studies focusing solely on technical aspects of electric vehicles without strategic decision-making implications.
5. Studies lacking a clear research methodology.

The lower publication year limit was set to 2012 to capture pioneering studies on Artificial Intelligence-based decision support systems and optimization models in the electric vehicle domain.

Articles indexed online before February 2026 were eligible for inclusion regardless of their official publication year. This criterion ensured that recently published studies available during the search period could be considered in the review.

Article Selection Process

The article selection process followed the PRISMA 2020 guidelines. The identification stage involved collecting all records retrieved from Scopus, ScienceDirect, and SpringerLink using the predefined search strings.

A total of 556 records were identified, consisting of 102 articles from Scopus, 378 articles from ScienceDirect, and 76 articles from SpringerLink. Duplicate records were identified and removed using the duplicate checking feature in Mendeley Reference

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Manager. The verification process was performed by comparing article titles, author names, publication years, and Digital Object Identifiers (DOIs) across the three databases.

The screening stage involved reviewing article titles and abstracts to determine their relevance to the research objectives. Articles that passed the screening stage were subsequently assessed during the eligibility stage to ensure compliance with the inclusion and exclusion criteria.

Studies meeting all eligibility criteria were included as primary sources for the systematic literature review. Bibliometric analysis was conducted separately using metadata exported exclusively from the Scopus database.

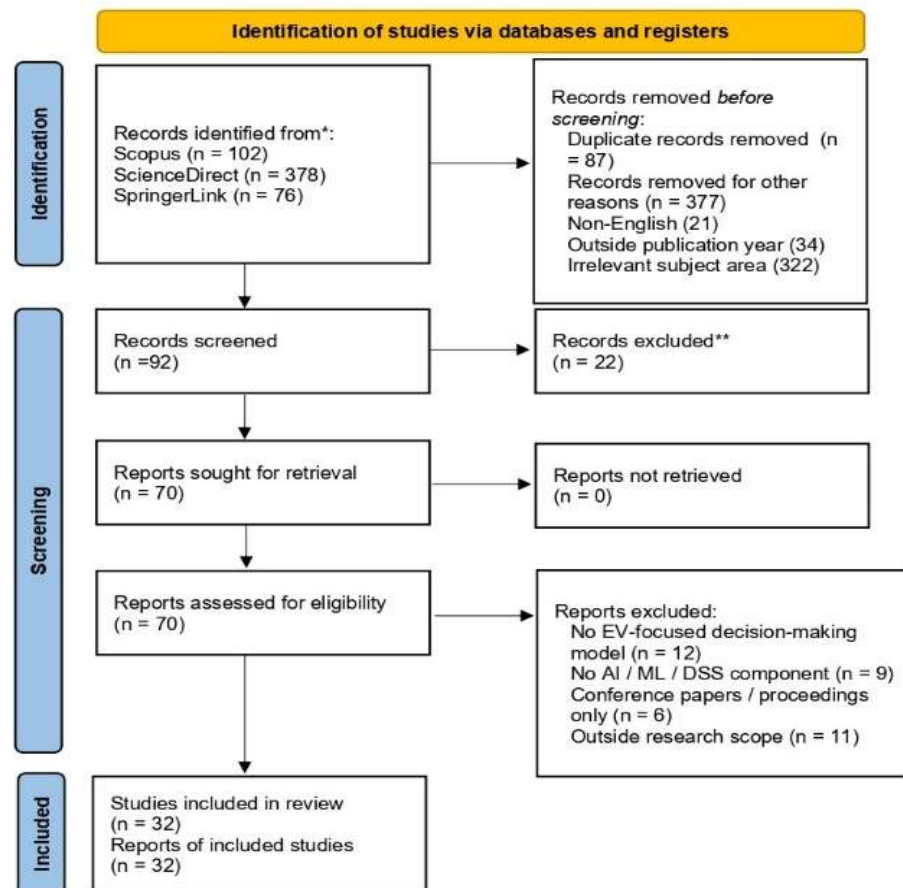


Figure 2. PRISMA 2020 Flow Diagram of the Study Selection Process

Bibliometric Analysis

Bibliometric analysis was performed using metadata obtained exclusively from the Scopus database. The exported metadata included author information, affiliations, article titles, abstracts, keywords, citation data, DOI information, references, and other publication-related details.

For bibliometric analysis, only Scopus metadata were exported in CSV format and analyzed using VOSviewer. ScienceDirect and SpringerLink were used exclusively as additional sources for article identification and systematic literature review screening. Scopus was selected because it provides standardized bibliographic metadata that are fully compatible with bibliometric mapping and visualization tools.

The analysis was conducted using VOSviewer to visualize relationships among bibliographic elements. The following analyses were performed:

1. Publication trend analysis.
2. Source analysis.
3. Author productivity analysis.
4. Citation analysis.
5. Co-authorship analysis.
6. Keyword co-occurrence analysis.
7. Research theme mapping.

The bibliometric results were utilized to identify research trends, dominant themes, and conceptual relationships related to Artificial Intelligence in strategic decision-making within the electric vehicle industry.

Systematic Literature Review Analysis

Articles meeting the selection criteria were further analyzed through a Systematic Literature Review process. The literature synthesis was conducted by categorizing studies according to their primary research themes.

The first theme focuses on the application of Artificial Intelligence in strategic decision-making. The second theme examines Predictive Analytics and Engineering Decision Making as foundations for evaluating alternative decisions. The third theme investigates the use of Fuzzy Logic and Optimization Models for managing uncertainty and identifying optimal strategies.

The synthesized findings were used to identify research gaps, establish conceptual relationships among key variables, and develop an Input–Process–Output conceptual model integrating Artificial Intelligence, Predictive Analytics, Engineering Decision

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Making, Fuzzy Logic, and Optimization Models for supporting strategic decision-making in the electric vehicle industry.

RESULTS AND DISCUSSION

Keyword Co-occurrence Analysis

Keyword co-occurrence analysis was conducted using VOSviewer version 1.6.20 based on author keywords extracted from the Scopus dataset. The analysis generated a network consisting of 28 keywords, 57 links, and a total link strength (TLS) of 77, indicating a moderate-to-strong relationship among the research topics within the field of AI-enabled strategic decision-making in the electric vehicle industry.

The network visualization revealed five major thematic clusters representing the intellectual structure of the research domain.

Network Visualization Analysis

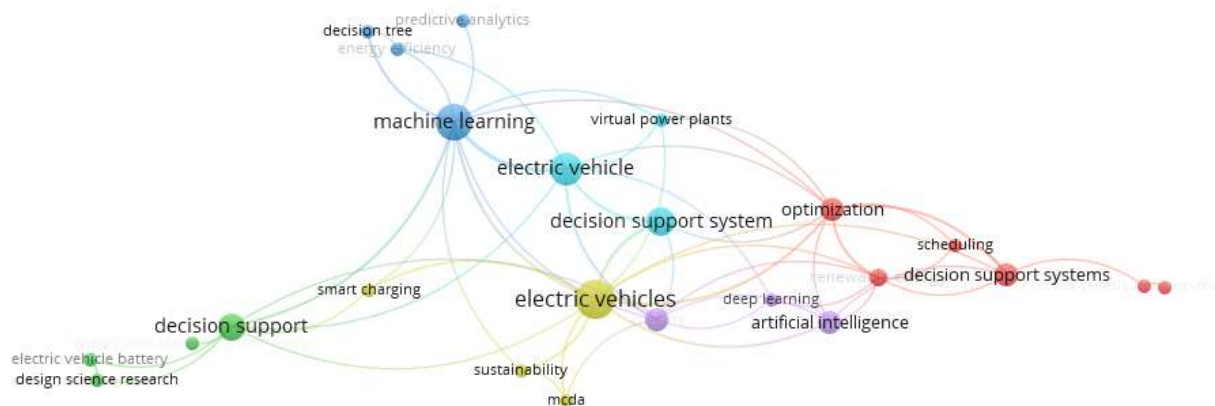


Figure 3. Keyword Co-occurrence Network

The network visualization identifies five thematic clusters. Cluster 1 (Red): Intelligent Decision Support and Optimization

Keywords: optimization, decision support systems, scheduling, decision-making

This cluster focuses on optimization-based decision support systems for operational and strategic planning in electric vehicle ecosystems. Research in this cluster

emphasizes scheduling, resource allocation, and optimization techniques for improving system efficiency.

Cluster 2 (Blue): Machine Learning and Predictive Analytics

Keywords: machine learning, decision tree, predictive analytics, energy efficiency

This cluster highlights the increasing application of machine learning methods for forecasting, classification, and predictive decision-making. These techniques are widely employed to support energy management and strategic planning.

Cluster 3 (Green): Decision Support and Battery-Related Studies

Keywords: decision support, electric vehicle battery, design science research, smart charging

The cluster represents studies focused on battery management, charging strategies, and decision support frameworks designed to enhance operational efficiency and sustainability.

Cluster 4 (Yellow): Electric Vehicles and Sustainability

Keywords: electric vehicles, sustainability, MCDM

This cluster forms the central research theme of the network. Electric vehicles act as the primary research object connecting sustainability-oriented decision-making and multi-criteria evaluation approaches.

Cluster 5 (Purple): Artificial Intelligence Technologies

Keywords: artificial intelligence, deep learning

The cluster reflects the growing use of advanced AI techniques to support intelligent decision-making processes across multiple EV-related applications.

Central Keywords

Based on node size and network position, the most influential keywords are:

Table 3. Most Influential keywords

Keywords	Importance
Electric Vehicles	Very High



Machine Learning	Very High
Decision Support System	Very High
Electric Vehicle	High
Decision Support	High
Optimization	High
Artificial Intelligence	High

The results indicate that the literature is strongly centered around the integration of AI techniques with decision support systems to address challenges related to electric vehicles.

Overlay Visualization Analysis

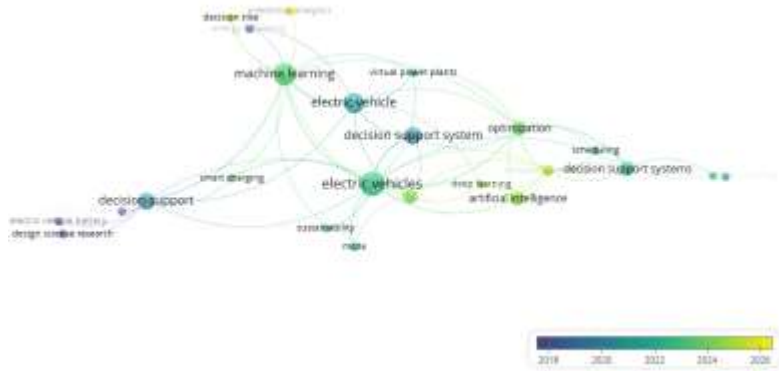


Figure 4. Overlay Visualization of Keywords

The overlay visualization illustrates the temporal evolution of research topics from 2018 to 2026. Earlier studies (blue-purple colors) concentrated on decision support, electric vehicle battery, energy efficiency, design science research.

These studies primarily addressed foundational decision-support concepts and battery management issues.

More recent studies (green-yellow colors) focus on optimization, artificial intelligence, deep learning, decision support systems, renewable energy

This shift indicates a transition from conventional decision-support approaches toward AI-driven and sustainability-oriented strategic decision-making models.



The appearance of deep learning and renewable energy as emerging keywords suggests that future research is increasingly directed toward intelligent energy management and advanced predictive analytics.

4.5 Density Visualization Analysis

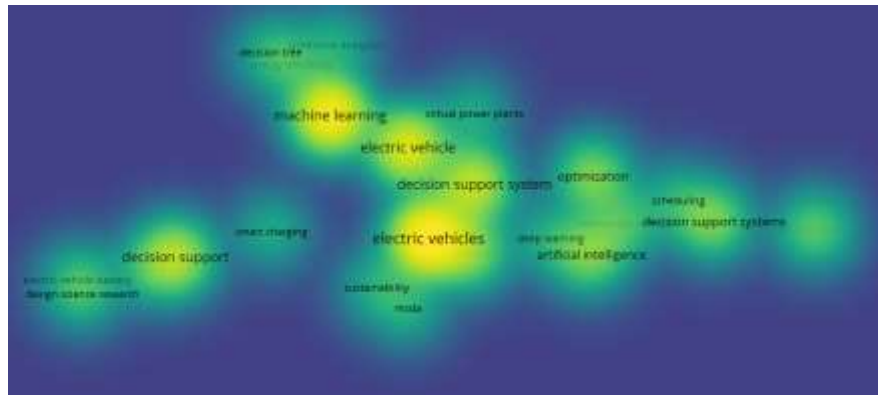


Figure 5. Density Visualization of Keywords

The density visualization highlights the most intensively studied topics within the research field. The brightest areas are concentrated around electric vehicles, machine learning, decision support system. This finding demonstrates that these three concepts constitute the core knowledge domain of AI-enabled strategic decision-making in the electric vehicle industry.

Secondary hotspots are observed around optimization, artificial intelligence, decision support systems, sustainability.

The results indicate that sustainability and intelligent optimization are emerging as important research directions that complement traditional EV-focused studies.

Bibliometric Findings and Research Trends

The bibliometric analysis reveals three major research trends:

Trend 1: AI-Driven Decision Support

Research is increasingly adopting Machine Learning, Deep Learning, Predictive Analytics to improve strategic decision-making capabilities.

Trend 2: Sustainable EV Ecosystems

Keywords such as sustainability, renewable energy, smart charging indicate growing attention toward environmentally sustainable mobility systems.

Trend 3: Optimization-Based Strategic Planning

Optimization remains a dominant theme for charging infrastructure planning, fleet management, energy scheduling, smart grid integration.

Systematic Literature Review Findings

Table 4. Characteristics of Included Studies (n = 32)

No	Author (s)	Year	AI / Analytical Technique	EV Application Domain
1	Cavus et al.	2026	Clustering, Machine Learning, XAI	Charging Infrastructure Planning
2	Guisado-Lizar et al.	2025	Decision Support System, Machine Learning	Charging Station Allocation
3	Ji et al.	2026	IoT Analytics, BiLSTM-GRU, TabNet-TCN	EV Fleet Energy Management
4	Nasimov et al.	2026	LSTM, Hybrid MCDM (IVPF-BWM-TOPSIS)	Renewable Energy & EV Infrastructure
5	Xu et al.	2024	MAML-CNN-LSTM-Attention	V2G Capacity Forecasting
6	Senthil Kumar et al.	2026	QSVC, PSO, Intelligent Battery Analytics	Battery Management Systems
7	Hu & Gao	2021	Machine Learning, Data-Driven Prediction	Battery SOC Prediction
8	Al-Gabalawy	2021	Reinforcement Learning	Virtual Power Plant Optimization
9	Ekici et al.	2025	Bio-Inspired AI (WUTP)	Regenerative Braking Optimization
10	Peng et al.	2025	NeuroSymbolic AI, Digital Twin	Battery Remanufacturing



11	Hazra et al.	2026	Machine Learning, Predictive Analytics	Automotive Trend Forecasting
12	Nucci	2026	Deep Reinforcement Learning, Fuzzy Logic	Electric Service Scheduling
13	Kahlen & Ketter	2014	Decision Support System	Shared EV Virtual Power Plant
14	Jaoua et al.	2019	Simulation-Based Optimization	Shared Autonomous EV Delivery
15	Jauhar et al.	2024	Artificial Intelligence, Machine Learning	EV Power Demand Forecasting
16	Radhika et al.	2025	Explainable AI, Time-Series Forecasting	EV Charging Infrastructure Investment
17	Kahlen et al.	2024	Smart Analytics, Market Machine Learning	Shared EV Resource Allocation
18	Kachroudi et al.	2012	Particle Swarm Optimization	Predictive Driving Guidance
19	Şimşek et al.	2025	MCDM, Machine Learning	EV Selection Decision Support
20	Önden & Önden	2026	Predictive Analytics, Machine Learning	EV Battery End-of-Life Management
21	Lu & Shi	2026	Explainable Large Language Model	Charging Station Occupancy Prediction
22	Grossard et al.	2012	Iterative Optimization	EV Energy Management
23	Albrecht et al.	2024	Generative AI (GAN, VAE)	EV Carsharing Decision Support
24	Testasecca et al.	2025	Digital Twin, Machine Learning, Optimization	Smart Charging in Microgrids



25	Yeh & Wang	2023	Machine Learning	EV Sales Forecasting
26	Zhou	2025	Integer Programming Optimization	EV Logistics Route Optimization
27	Schmidt et al.	2021	Simulation, Charging Optimization	Commercial Fleet Electrification
28	Kloör et al.	2018	Model-Driven DSS, Integer Programming	Battery Repurposing
29	Klor et al.	2017	Recommender System, Collaborative Filtering	Battery Second-Life Applications
30	Niu et al.	2024	PROMETHEE-II MCDM	Battery EV Purchase Decision
31	Gopisetty et al.	2025	LOPCOW-RAM MCDM	Sustainable EV Selection
32	Bas et al.	2021	Machine Learning Classification	EV Adoption Prediction

The systematic literature review was conducted to identify the dominant Artificial Intelligence (AI) approaches, decision-making models, and application domains within the electric vehicle (EV) industry. Based on the selected studies, the literature can be categorized into three major research streams, namely AI-based decision support systems, predictive analytics and engineering decision making, and fuzzy logic-based optimization models.

The first stream focuses on the implementation of Artificial Intelligence techniques to support strategic decision-making processes. Machine Learning, Deep Learning, and Decision Support Systems (DSS) are widely applied to improve forecasting accuracy, resource allocation, battery management, charging infrastructure planning, and operational efficiency. Studies indicate that AI technologies enable organizations to process large volumes of data and generate data-driven recommendations that enhance strategic decision quality.

The second stream emphasizes Predictive Analytics and Engineering Decision Making. Forecasting models such as SARIMA, LSTM, and hybrid approaches are



commonly utilized to predict demand, energy consumption, traffic patterns, and production requirements. The forecasting results are subsequently used as inputs for engineering decision-making processes involving capacity planning, bottleneck identification, risk assessment, and production strategy formulation.

The third stream addresses the utilization of Fuzzy Logic and Optimization Models to manage uncertainty and evaluate multiple decision criteria simultaneously. Fuzzy Logic enables the representation of subjective assessments related to risk, profitability, flexibility, and sustainability. Optimization techniques are employed to determine the most appropriate strategic alternatives while balancing economic, operational, and environmental objectives.

Overall, the reviewed literature demonstrates that AI technologies are increasingly integrated into strategic decision-making processes within the EV industry. However, most studies focus on specific applications rather than providing a comprehensive framework that integrates predictive analytics, engineering decision making, fuzzy logic, and optimization into a unified strategic decision-making model.

Proposed Conceptual Framework

Based on the findings of both the bibliometric analysis and systematic literature review, this study proposes a conceptual framework for AI-enabled strategic decision-making in the electric vehicle industry.

The proposed framework was developed through the synthesis of findings obtained from the three dominant research streams identified in the literature, namely AI-based decision support systems, predictive analytics and engineering decision making, and fuzzy logic-based optimization models. The integration of these streams forms a comprehensive strategic decision-making model capable of supporting sustainable development within the electric vehicle industry.

The framework adopts the Input–Process–Output (IPO) perspective. The input stage consists of historical sales data, production capacity, inventory information, operational costs, market demand, and available resources. These variables represent the fundamental information required for strategic analysis.

The process stage integrates four complementary components. The first component is Predictive Analytics, which utilizes forecasting models such as Seasonal Autoregressive Integrated Moving Average (SARIMA) and Long Short-Term Memory (LSTM) to estimate future demand and market conditions. SARIMA provides statistical forecasting capabilities for capturing trend and seasonal patterns, whereas LSTM

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represents a Deep Learning-based approach capable of modeling complex temporal dependencies and nonlinear relationships. The combination of these forecasting techniques enables more comprehensive demand prediction and supports strategic planning under dynamic market conditions. The second component is Engineering Decision Making, which evaluates production capacity, bottlenecks, resource availability, and strategic alternatives. The third component is Fuzzy Logic, which manages uncertainty associated with risk, flexibility, and qualitative judgments. The fourth component is Optimization Models, which identify the best strategic alternatives according to predefined objectives.

The output stage generates strategic decisions related to capacity expansion, production planning, inventory management, charging infrastructure development, technology investment, and market growth strategies. The resulting decisions aim to maximize profitability while minimizing risks and maintaining organizational flexibility.

The proposed framework contributes to the literature by integrating Predictive Analytics, Engineering Decision Making, Fuzzy Logic, and Optimization Models into a unified AI-enabled strategic decision-making model specifically designed for the electric vehicle industry. Furthermore, the framework provides a conceptual foundation for supporting sustainable business strategies, green innovation, and sustainability innovation within the evolving electric vehicle ecosystem.

DISCUSSION

The findings of this study demonstrate that Artificial Intelligence (AI) has become a critical enabler of strategic decision-making within the electric vehicle (EV) industry. The literature review indicates that AI technologies, particularly Machine Learning, Deep Learning, and Decision Support Systems, have significantly enhanced organizations' abilities to process large volumes of data, generate accurate forecasts, and support evidence-based decision-making. Furthermore, Predictive Analytics approaches such as SARIMA and LSTM provide valuable insights into future market demand and operational requirements, enabling more effective planning and resource allocation. The integration of Engineering Decision Making, Fuzzy Logic, and Optimization Models further strengthens decision quality by addressing uncertainty, evaluating multiple decision criteria, and identifying optimal strategic alternatives. These findings are consistent with previous studies highlighting the growing importance of AI-driven decision support in complex and dynamic industrial environments. In the context of the EV industry, where technological innovation, market volatility, sustainability pressures, and competitive

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challenges continuously evolve, AI-based decision-making frameworks offer substantial advantages in improving organizational adaptability, operational efficiency, and long-term competitiveness. Moreover, the increasing emphasis on sustainability, renewable energy integration, and intelligent mobility systems suggests that future strategic decision-making models should incorporate not only economic objectives but also environmental and social considerations. Therefore, the development of an integrated AI-enabled framework combining Predictive Analytics, Engineering Decision Making, Fuzzy Logic, and Optimization Models represents a promising direction for supporting sustainable growth and innovation within the electric vehicle ecosystem.

CONCLUSION

This study aimed to systematically review and analyze the development of Artificial Intelligence (AI)-enabled strategic decision-making within the electric vehicle (EV) industry through a combination of Systematic Literature Review (SLR) and bibliometric analysis. The findings reveal that research in this field has expanded significantly, with major themes centered on machine learning, decision support systems, predictive analytics, optimization, and sustainability. The literature demonstrates that AI technologies play a vital role in enhancing strategic decision-making by improving forecasting accuracy, supporting resource allocation, optimizing operational performance, and facilitating data-driven planning. Furthermore, the integration of Predictive Analytics, Engineering Decision Making, Fuzzy Logic, and Optimization Models provides a comprehensive approach for addressing uncertainty and evaluating complex strategic alternatives in the EV industry.

The study also identifies an important research gap related to the limited availability of integrated frameworks that combine these complementary approaches within a unified AI-based decision-making environment. To address this gap, the proposed conceptual framework offers a holistic perspective that connects forecasting, decision evaluation, uncertainty management, and optimization processes to support sustainable strategic decisions. In addition to improving organizational competitiveness, AI-driven decision-making contributes to green innovation, renewable energy integration, intelligent mobility systems, and sustainable business development. Future research is recommended to validate the proposed framework using real-world industrial data and to explore the integration of advanced AI techniques with sustainability-oriented decision-making models, thereby strengthening the role of AI as a key enabler of sustainable transformation in the electric vehicle ecosystem.

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