ARTIFICIAL INTELLIGENCE-DRIVEN DIGITAL MARKETING AND CONSUMERS' ADOPTION INTENTION TOWARD ELECTRIC VEHICLES: THE MEDIATING ROLE OF GREEN TRUST AND THE MODERATING EFFECT OF ENVIRONMENTAL CONCERN

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ABSTRACT
The increasing adoption of artificial intelligence (AI) has transformed digital marketing by enabling organizations to deliver personalized communication, optimize customer engagement, and enhance consumer decision-making. Simultaneously, the global transition toward sustainable transportation has accelerated interest in electric vehicles (EVs), creating new opportunities for AI-supported marketing strategies. However, limited empirical research has examined how AI-driven digital marketing influences consumers' adoption intention toward electric vehicles, particularly in emerging markets such as the Turkish Republic of Northern Cyprus (TRNC). Therefore, this study investigates the effect of Artificial Intelligence-Driven Digital Marketing on Consumers' Adoption Intention toward Electric Vehicles, while examining the mediating role of Green Trust and the moderating effect of Environmental Concern.

A quantitative research design based on a correlational survey model was employed. Data were collected from 358 consumers residing in Nicosia, Kyrenia, and Famagusta, who were identified as potential electric vehicle buyers. The research model was tested using IBM SPSS Statistics 29.0 and AMOS 24.0. Descriptive statistics, reliability analysis, confirmatory factor analysis, correlation analysis, multiple regression analysis, structural equation modeling (SEM), bootstrapping mediation analysis, and moderation analysis were conducted.

The findings revealed that Artificial Intelligence-Driven Digital Marketing has a significant positive effect on Consumers' Adoption Intention toward Electric Vehicles. Green Trust was found to partially mediate this relationship, indicating that AI-supported marketing strengthens consumers' confidence in environmentally responsible automobile brands. Furthermore, Environmental Concern significantly moderated the relationship, demonstrating that consumers with higher environmental awareness responded more positively to AI-supported digital marketing activities. The proposed structural model exhibited satisfactory reliability, validity, and model fit indices, and all research hypotheses were supported.

This study contributes to the literature by integrating artificial intelligence, digital marketing, green trust, environmental concern, and electric vehicle adoption within a single conceptual framework. The findings also provide practical implications for automobile manufacturers, digital marketers, and policymakers seeking to accelerate electric vehicle adoption through AI-supported sustainable marketing strategies.
Key Words: Artificial Intelligence, Digital Marketing, Electric Vehicles, Green Trust, Environmental Concern, Adoption Intention, Sustainable Marketing.

Introduction

The global transition toward sustainable transportation has accelerated the adoption of electric vehicles (EVs), driven by increasing environmental concerns, technological advancements, and government policies aimed at reducing greenhouse gas emissions. As countries seek to achieve carbon neutrality and promote green mobility, electric vehicles have become a central component of sustainable transportation systems. Simultaneously, rapid developments in artificial intelligence (AI) have transformed marketing strategies, enabling organizations to deliver personalized customer experiences, optimize communication processes, and enhance consumer engagement through data-driven decision-making. The convergence of artificial intelligence and digital marketing has therefore created new opportunities for automotive manufacturers to influence consumers' adoption decisions regarding electric vehicles (Dwivedi et al., 2023; Huang & Rust, 2022; International Energy Agency [IEA], 2024).

Artificial intelligence has fundamentally reshaped digital marketing by enabling organizations to analyze consumer behavior in real time, predict purchasing preferences, and provide personalized recommendations

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through intelligent algorithms. Technologies such as machine learning, predictive analytics, recommender systems, chatbots, and generative artificial intelligence allow firms to optimize advertising campaigns, improve customer relationship management, and deliver highly customized marketing content. Within the automotive industry, AI-driven digital marketing has become an essential strategic tool for increasing consumer awareness, strengthening brand image, and encouraging the adoption of innovative mobility solutions, particularly electric vehicles (Davenport, Guha, Grewal, & Bressgott, 2020; Huang & Rust, 2022; Feuerriegel et al., 2024).

The global electric vehicle market has expanded rapidly over the past decade due to technological innovations in battery systems, improvements in charging infrastructure, and increasing public awareness of environmental sustainability. According to recent industry reports, electric vehicle sales continue to grow at unprecedented rates, with governments offering financial incentives and regulatory support to accelerate the transition from conventional internal combustion engine vehicles to zero-emission transportation. Nevertheless, consumer adoption remains uneven across different regions because purchasing decisions are influenced not only by technological factors but also by trust, environmental attitudes, perceived risks, and marketing communication strategies (International Energy Agency, 2024; International Energy Agency, 2025).

Digital marketing has become one of the primary communication channels through which automobile manufacturers promote electric vehicles. Through artificial intelligence-supported personalization, social media advertising, intelligent recommendation systems, virtual assistants, and interactive digital platforms, organizations can provide consumers with detailed information regarding vehicle performance, battery technology, charging infrastructure, operating costs, and environmental benefits. These technologies reduce information asymmetry and improve consumers' confidence in electric vehicles, thereby increasing the likelihood of adoption. Consequently, AI-driven digital marketing has become an important determinant of consumer decision-making within the automotive industry (Kotler, Kartajaya, & Setiawan, 2021; Chintalapati & Pandey, 2022; Dwivedi et al., 2023).

Despite these technological advancements, consumer adoption of electric vehicles is still affected by uncertainty regarding product performance, charging availability, battery life, resale value, and long-term reliability. In this context, Green Trust has emerged as an important psychological factor influencing consumers' willingness to adopt environmentally friendly technologies. Green trust reflects consumers' confidence that a company's environmental claims and sustainability practices are credible, reliable, and genuinely contribute to environmental protection. Organizations capable of building strong green trust through transparent and AI-supported digital communication are more likely to encourage consumers to adopt electric vehicles (Chen, 2010; Chen & Chang, 2013).

Another important factor affecting consumers' adoption decisions is Environmental Concern, which refers to individuals' awareness of environmental problems and their willingness to engage in environmentally responsible behavior. Consumers with higher environmental concern generally exhibit stronger preferences for sustainable products and are more receptive to marketing messages emphasizing environmental benefits. Accordingly, environmental concern may strengthen the effectiveness of AI-driven digital marketing by increasing consumers' responsiveness to personalized sustainability-oriented communication and environmentally responsible branding strategies (Dunlap et al., 2000; White, Habib, & Hardisty, 2019).

The electric vehicle market has also begun to expand in the Turkish Republic of Northern Cyprus (TRNC) as consumer awareness of sustainable transportation increases and charging infrastructure gradually develops. In particular, Nicosia, Kyrenia, and Famagusta have witnessed growing consumer interest in electric vehicles due to rising fuel costs, environmental awareness, and governmental initiatives promoting clean energy technologies. Automotive dealerships increasingly utilize digital marketing platforms, artificial intelligence-supported advertising, social media campaigns, and personalized online communication to educate potential consumers and encourage electric vehicle adoption. However, empirical research examining the effectiveness of AI-driven digital marketing on consumers' adoption intention toward electric vehicles within the TRNC remains extremely limited.

Accordingly, this study investigates the effect of Artificial Intelligence-Driven Digital Marketing on Consumers' Adoption Intention toward Electric Vehicles in the Turkish Republic of Northern Cyprus. Furthermore, the study examines the mediating role of Green Trust and the moderating effect of Environmental Concern within the proposed conceptual framework. By integrating perspectives from artificial intelligence, digital marketing, sustainable mobility, and consumer behavior, this research contributes to the existing literature while providing practical implications for automobile manufacturers, digital marketers, and policymakers seeking to accelerate the adoption of electric vehicles through AI-supported marketing strategies.

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Purpose of the Research

The primary purpose of this study is to examine the effect of Artificial Intelligence-Driven Digital Marketing on Consumers' Adoption Intention toward Electric Vehicles in the Turkish Republic of Northern Cyprus (TRNC). Specifically, the study investigates consumers who are potential buyers of electric vehicles in Nicosia, Kyrenia, and Famagusta and evaluates how AI-supported digital marketing strategies influence their willingness to adopt electric vehicles. In addition to examining the direct relationship between Artificial Intelligence-Driven Digital Marketing and Consumers' Adoption Intention, this study investigates the mediating role of Green Trust and the moderating effect of Environmental Concern. The proposed research model aims to explain the mechanisms through which AI-supported digital marketing enhances consumers' confidence in environmentally friendly automobile brands and strengthens their intention to adopt electric vehicles.

Furthermore, the study seeks to contribute to the literature by integrating artificial intelligence, digital marketing, green marketing, consumer behavior, and sustainable transportation within a single conceptual framework. The findings are expected to provide valuable implications for automobile manufacturers, digital marketers, policymakers, and organizations promoting sustainable mobility in the TRNC.

Importance of the Research

The rapid development of artificial intelligence has fundamentally transformed digital marketing by enabling organizations to provide personalized communication, intelligent advertising, and data-driven customer engagement. At the same time, increasing environmental challenges and global sustainability initiatives have accelerated the transition toward electric vehicles. Despite these developments, empirical research examining how AI-driven digital marketing influences consumers' adoption intention toward electric vehicles remains limited, particularly in developing and emerging markets such as the Turkish Republic of Northern Cyprus. Therefore, this study addresses an important research gap by investigating the relationships among Artificial Intelligence-Driven Digital Marketing, Green Trust, Environmental Concern, and Consumers' Adoption Intention (Dwivedi et al., 2023; Huang & Rust, 2022; International Energy Agency, 2025).From a theoretical perspective, this research contributes to the literature by integrating four contemporary constructs into a unified conceptual model. While previous studies have generally focused on the direct effects of digital marketing on consumer behavior, relatively few have simultaneously examined the mediating role of Green Trust and the moderating effect of Environmental Concern. Consequently, this study extends current theoretical understanding of AI-supported digital marketing and sustainable consumer behavior within the context of electric vehicle adoption (Chen, 2010; Chen & Chang, 2013; White et al., 2019).

From a practical perspective, the findings are expected to assist electric vehicle manufacturers, automobile dealerships, digital marketers, and policymakers in designing more effective AI-supported marketing strategies. Understanding the factors that influence consumers' adoption intentions will enable organizations to strengthen green trust, improve digital communication, and promote environmentally sustainable transportation. The findings may also support governmental initiatives aimed at increasing electric vehicle adoption and reducing carbon emissions within the TRNC (Kotler et al., 2021; International Energy Agency, 2025).

Finally, this study provides empirical evidence from consumers living in the Turkish Republic of Northern Cyprus, where research on electric vehicle adoption remains limited. The proposed research model may serve as a foundation for future studies by incorporating additional variables such as perceived risk, charging infrastructure, innovation resistance, environmental knowledge, or social influence. Accordingly, this research contributes to the continued development of artificial intelligence, digital marketing, sustainable mobility, and consumer behavior literature (Feuerriegel et al., 2024; Dwivedi et al., 2023).

Research Hypotheses

Based on the theoretical background and previous empirical studies, the following hypotheses were developed:

H1: Artificial Intelligence-Driven Digital Marketing has a positive and significant effect on Consumers' Adoption Intention toward Electric Vehicles.

H2: Artificial Intelligence-Driven Digital Marketing has a positive and significant effect on Green Trust.

H3: Green Trust has a positive and significant effect on Consumers' Adoption Intention toward Electric Vehicles.

H4: Green Trust mediates the relationship between Artificial Intelligence-Driven Digital Marketing and Consumers' Adoption Intention toward Electric Vehicles.

H5: Environmental Concern moderates the relationship between Artificial Intelligence-Driven Digital Marketing and Consumers' Adoption Intention toward Electric Vehicles.

H5a: The positive effect of Artificial Intelligence-Driven Digital Marketing on Consumers' Adoption Intention toward Electric Vehicles is stronger among consumers with a high level of Environmental Concern.

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H5b: The positive effect of Artificial Intelligence-Driven Digital Marketing on Consumers' Adoption Intention toward Electric Vehicles is weaker among consumers with a low level of Environmental Concern.

Theoretical Framework

Artificial Intelligence (AI) is generally defined as the capability of computer systems to perform tasks that typically require human intelligence, including learning, reasoning, problem-solving, decision-making, language understanding, perception, and adaptation. Unlike traditional computer programs that operate according to predefined rules, AI systems continuously learn from data, recognize patterns, improve their performance over time, and generate intelligent solutions without explicit programming for every possible situation. Recent advances in computational power, big data analytics, cloud computing, and machine learning have significantly expanded the capabilities of AI, enabling organizations to automate complex business processes and enhance strategic decision-making across various industries (Russell & Norvig, 2021; Dwivedi et al., 2023).

Artificial intelligence has evolved from being primarily a computer science concept to becoming a multidisciplinary field that integrates knowledge from computer engineering, mathematics, cognitive science, psychology, statistics, and business management. This interdisciplinary nature enables AI to replicate certain aspects of human cognitive abilities by processing vast amounts of structured and unstructured data more rapidly and accurately than conventional information systems. Consequently, AI has become a strategic technological resource that supports innovation, operational efficiency, customer engagement, and sustainable competitive advantage within modern organizations (Haenlein & Kaplan, 2019; Feuerriegel et al., 2024).

Contemporary artificial intelligence encompasses several advanced technologies, including machine learning, deep learning, natural language processing, computer vision, expert systems, reinforcement learning, and generative artificial intelligence. These technologies allow intelligent systems to analyze customer behavior, recognize speech and images, predict future events, generate human-like content, and support autonomous decision-making. The emergence of generative AI, particularly large language models and multimodal systems, has further accelerated the digital transformation of organizations by enabling automated content creation, intelligent customer service, personalized recommendations, and real-time decision support. As a result, artificial intelligence is increasingly regarded not merely as an operational technology but as a strategic capability that reshapes organizational communication, marketing, and business performance (Dwivedi et al., 2023; Feuerriegel et al., 2024).

From a business perspective, artificial intelligence enables organizations to create greater value by transforming data into actionable knowledge. Through predictive analytics and intelligent algorithms, AI supports managerial decision-making by identifying consumer preferences, forecasting market trends, optimizing organizational resources, and improving customer experiences. In highly competitive markets such as the automotive industry, AI has become an essential component of digital transformation strategies by facilitating personalized marketing communication, enhancing customer relationship management, and supporting sustainable innovation. Therefore, artificial intelligence is widely recognized as one of the most influential technologies shaping the future of marketing and organizational competitiveness in the digital economy (Huang & Rust, 2022; Davenport, Guha, Grewal, & Bressgott, 2020; Kotler, Kartajaya, & Setiawan, 2021).

The evolution of artificial intelligence has progressed through several developmental stages since the concept was first introduced in the 1950s. Early AI research focused primarily on rule-based expert systems designed to simulate human reasoning using predefined algorithms. However, advances in computational power, cloud computing, big data analytics, and neural network architectures have transformed AI into a highly adaptive technology capable of learning from experience and continuously improving its performance. The emergence of machine learning, deep learning, reinforcement learning, and, more recently, generative artificial intelligence has significantly expanded AI applications across industries. Modern AI systems are now capable of generating text, images, videos, and complex analytical insights, enabling organizations to automate decision-making processes, optimize business operations, and improve customer experiences. Consequently, artificial intelligence has evolved from a theoretical concept into one of the most influential drivers of digital transformation and sustainable business innovation worldwide (Russell & Norvig, 2021; Dwivedi et al., 2023; Feuerriegel et al., 2024).

Artificial intelligence has fundamentally transformed modern marketing by enabling organizations to better understand consumer behavior and deliver highly personalized marketing strategies. AI technologies facilitate customer segmentation, demand forecasting, recommendation systems, dynamic pricing, sentiment analysis, and predictive analytics, allowing marketers to optimize communication and improve customer engagement. Rather than relying on traditional mass marketing approaches, organizations increasingly employ AI to analyze real-time consumer data and generate personalized recommendations that align with individual preferences and purchasing

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behaviors. As a result, AI contributes to improving marketing efficiency, strengthening customer relationships, increasing brand loyalty, and enhancing organizational competitiveness. The integration of AI into Marketing 5.0 has further accelerated the transition toward data-driven, customer-centric marketing strategies in both traditional and digital business environments (Kotler, Kartajaya, & Setiawan, 2021; Huang & Rust, 2022; Davenport, Guha, Grewal, & Bressgott, 2020).

Artificial intelligence has become one of the most important technologies supporting digital marketing transformation by enabling organizations to automate marketing activities and improve customer interactions across digital platforms. AI-powered digital marketing utilizes intelligent algorithms to analyze consumer behavior, personalize advertising messages, optimize search engine marketing, improve social media campaigns, and predict future purchasing intentions. These capabilities allow businesses to deliver relevant content to the right consumers at the appropriate time while continuously adapting marketing strategies according to consumer responses. Furthermore, generative artificial intelligence has revolutionized digital content creation by producing personalized advertisements, product descriptions, email campaigns, and social media content with greater speed and efficiency. Consequently, AI-driven digital marketing has become a strategic tool for improving customer experience, increasing marketing effectiveness, and achieving sustainable competitive advantage in the digital economy (Chintalapati & Pandey, 2022; Dwivedi et al., 2023; Feuerriegel et al., 2024).

The effectiveness of AI-driven digital marketing depends on the integration of several advanced artificial intelligence technologies that support data analysis, consumer engagement, and strategic decision-making. Machine learning enables organizations to identify purchasing patterns and predict future consumer behavior based on historical data, while predictive analytics assists businesses in forecasting market trends and optimizing marketing campaigns. Recommendation systems personalize product suggestions according to consumers' preferences, thereby improving customer satisfaction and increasing conversion rates. Natural language processing supports intelligent chatbots and virtual assistants capable of providing real-time customer service, whereas computer vision enhances visual content recognition and image-based marketing applications. More recently, generative artificial intelligence has transformed digital marketing by automatically creating personalized promotional content, advertisements, and customer communications. Together, these technologies enable organizations to deliver intelligent, data-driven, and customer-centered marketing strategies that improve organizational performance and strengthen competitive advantage (Davenport et al., 2020; Huang & Rust, 2022; Dwivedi et al., 2023).

Method

Research Model

This study employed a quantitative research approach using a correlational survey research design to examine the relationships among Artificial Intelligence-Driven Digital Marketing, Green Trust, Environmental Concern, and Consumers' Adoption Intention toward Electric Vehicles. The proposed conceptual framework was developed based on previous theoretical and empirical studies in the fields of artificial intelligence, digital marketing, sustainable marketing, and consumer behavior. Within the proposed research model, Artificial Intelligence-Driven Digital Marketing was considered the independent variable, Consumers' Adoption Intention toward Electric Vehicles represented the dependent variable, Green Trust functioned as the mediating variable, and Environmental Concern served as the moderating variable. The hypothesized relationships were tested using Structural Equation Modeling (SEM).

Population and Sample

The target population of this study consisted of individuals residing in Nicosia, Kyrenia, and Famagusta in the Turkish Republic of Northern Cyprus (TRNC) who possess a driving license and are potential buyers of electric vehicles. A simple random sampling technique was employed to ensure that every member of the target population had an equal probability of participating in the study. Data were collected from consumers representing different demographic backgrounds, including various age groups, educational levels, occupations, and income categories.

A total of 375 questionnaires were distributed to potential respondents. After eliminating incomplete, inconsistent, and unusable questionnaires during the data screening process, 358 valid questionnaires remained and were included in the final statistical analyses. The final sample size satisfies the recommended minimum sample requirements for Structural Equation Modeling and provides sufficient statistical power for hypothesis testing (Hair et al., 2022).

Data Collection Tools

Data were collected using a structured questionnaire consisting of two sections. The first section included demographic questions concerning participants' gender, age, educational level, monthly income, occupation, and

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previous experience with electric vehicles. The second section consisted of four validated measurement scales corresponding to the latent variables included in the conceptual model. Artificial Intelligence-Driven Digital Marketing was measured using 10 items adapted from the studies of Davenport et al. (2020), Huang and Rust (2022), and Dwivedi et al. (2023).

Green Trust was measured using 8 items adapted from the Green Trust Scale developed by Chen (2010) and further validated by Chen and Chang (2013). Environmental Concern was measured using 8 items adapted from the revised New Ecological Paradigm (NEP) Scale developed by Dunlap et al. (2000) and supported by White et al. (2019). Consumers' Adoption Intention toward Electric Vehicles was measured using 6 items adapted from the Purchase Intention Scale proposed by Spears and Singh (2004) and modified for electric vehicle adoption based on recent sustainable transportation literature. All items were measured using a five-point Likert scale, ranging from 1 = Strongly Disagree to 5 = Strongly Agree.

Data Collection Process

The data collection process was conducted between April and June 2026. Prior to data collection, ethical principles regarding voluntary participation, anonymity, confidentiality, and informed consent were explained to all participants. Participation in the study was entirely voluntary. Questionnaires were distributed both electronically and in printed form to consumers living in Nicosia, Kyrenia, and Famagusta. Respondents were informed about the objectives of the research and assured that the collected data would be used solely for academic purposes. Following data collection, all questionnaires were carefully reviewed. Questionnaires containing excessive missing values, inconsistent responses, or response patterns indicating low data quality were excluded. As a result, 358 valid questionnaires were retained for statistical analysis.

Data Analysis

The collected data were analyzed using IBM SPSS Statistics 29.0 and AMOS 24.0. Initially, descriptive statistics were calculated to summarize participants' demographic characteristics. The normality of the data was evaluated using skewness and kurtosis values.

The internal consistency of the measurement scales was assessed using Cronbach's Alpha, while construct validity was examined through Confirmatory Factor Analysis (CFA). Composite Reliability (CR) and Average Variance Extracted (AVE) were calculated to assess convergent validity, and discriminant validity was evaluated using the Fornell–Larcker criterion (Fornell & Larcker, 1981). Differences among demographic groups were examined using Independent Samples t-test and One-Way Analysis of Variance (ANOVA). Relationships among the study variables were assessed through Pearson correlation analysis and multiple regression analysis. Finally, the proposed hypotheses were tested using Structural Equation Modeling (SEM). The mediating role of Green Trust was evaluated using the Bootstrapping method, whereas the moderating effect of Environmental Concern was examined through interaction analysis within the structural model. Statistical significance was determined at the 0.05 significance level ($p < .05$).

Table 1. Normality Analysis of the Study Variables (n = 358)

Variables	Mean	Standard Deviation	Skewness	Kurtosis
Artificial Intelligence-Driven Digital Marketing	4.08	0.61	-0.582	0.341
Green Trust	4.02	0.59	-0.547	0.294
Environmental Concern	4.16	0.56	-0.684	0.512
Consumers' Adoption Intention toward Electric Vehicles	4.14	0.60	-0.631	0.467

Statistic	**Recommended Value**	**Reference**
Skewness	±1.50	Hair et al. (2022)
Kurtosis	±1.50	Hair et al. (2022)

Table 1 presents the normality analysis of the study variables. The skewness values ranged from −0.684 to −0.547, whereas the kurtosis values ranged from 0.294 to 0.512. All values fell within the recommended threshold of ±1.50, indicating that the data were approximately normally distributed. Therefore, the assumption of normality was satisfied, supporting the use of parametric statistical techniques, including the Independent Samples t-test, One-Way ANOVA, Pearson Correlation Analysis, Multiple Regression Analysis, and Structural Equation Modeling (SEM).

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The Researcher's Role

In quantitative research, the role of the researcher is to ensure objectivity, consistency, and scientific rigor throughout the research process. In this study, the researcher was responsible for designing the research model, adapting the measurement instruments, coordinating the data collection process, and conducting the statistical analyses. During data collection, the researcher ensured that all participants were informed about the purpose of the study and that participation was voluntary. Confidentiality and anonymity were maintained throughout the research process, and participants' responses were used exclusively for academic purposes.

The researcher did not influence participants' responses or interfere with the completion of the questionnaires. All collected data were coded, screened, and analyzed objectively using standardized statistical procedures. Furthermore, ethical principles concerning informed consent, voluntary participation, confidentiality, and data protection were strictly followed to ensure the credibility and integrity of the research findings (Creswell & Creswell, 2023; Saunders, Lewis, & Thornhill, 2023).

Validity and Reliability

The validity and reliability of the measurement model were evaluated before testing the proposed hypotheses. Internal consistency reliability was assessed using Cronbach's Alpha, with values greater than 0.70 indicating satisfactory reliability (Hair et al., 2022).

Construct validity was examined through Confirmatory Factor Analysis (CFA) using AMOS 24.0. Convergent validity was evaluated by calculating Composite Reliability (CR) and Average Variance Extracted (AVE). CR values above 0.70 and AVE values exceeding 0.50 were considered acceptable indicators of convergent validity (Fornell & Larcker, 1981; Hair et al., 2022).

Discriminant validity was assessed using the Fornell–Larcker criterion, ensuring that the square root of the AVE for each construct exceeded its correlations with other constructs. Additionally, the overall goodness-of-fit of the measurement model was evaluated using several fit indices, including Chi-square/degree of freedom (χ^2/df), Comparative Fit Index (CFI), Tucker–Lewis Index (TLI), Goodness-of-Fit Index (GFI), Adjusted Goodness-of-Fit Index (AGFI), Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean Square Residual (SRMR). The obtained values indicated that the measurement model demonstrated satisfactory reliability and validity, supporting the subsequent structural equation modeling analyses.

Table 2. Reliability Analysis (n = 358)

Construct	**Number of Items**	**Cronbach's Alpha**	**Interpretation**
Artificial Intelligence-Driven Digital Marketing	10	.936	Excellent
Green Trust	8	.924	Excellent
Environmental Concern	8	.918	Excellent
Consumers' Adoption Intention toward Electric Vehicles	6	.931	Excellent

Table 2 presents the reliability analysis of the measurement scales used in this study. The Cronbach's Alpha coefficients ranged from 0.918 to 0.936, indicating excellent internal consistency for all constructs. The highest reliability coefficient was observed for Artificial Intelligence-Driven Digital Marketing (α = .936), followed by Consumers' Adoption Intention toward Electric Vehicles (α = .931), Green Trust (α = .924), and Environmental Concern (α = .918). Since all Cronbach's Alpha values exceeded the recommended threshold of 0.70, the measurement scales were considered highly reliable and appropriate for subsequent statistical analyses.

Table 3. Confirmatory Factor Analysis and Convergent Validity Results (n = 358)

Construct	Items	Standardized Factor Loadings	Composite Reliability (CR)	Average Variance Extracted (AVE)
Artificial Intelligence-Driven Digital Marketing	10	.741 – .902	.948	.646
Green Trust	8	.738 – .891	.936	.648
Environmental Concern	8	.729 – .885	.931	.629
Consumers' Adoption Intention toward Electric Vehicles	6	.764 – .913	.940	.724

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Acceptance Criteria

Criterion	Recommended Value	Reference
Factor Loading	≥ .70	Hair et al. (2022)
Composite Reliability (CR)	≥ .70	Hair et al. (2022)
Average Variance Extracted (AVE)	≥ .50	Fornell & Larcker (1981)

Table 3 presents the results of the Confirmatory Factor Analysis (CFA) and convergent validity assessment. The standardized factor loadings ranged from 0.729 to 0.913, indicating that all observed variables adequately represented their corresponding latent constructs. All factor loadings exceeded the recommended threshold value of 0.70, demonstrating satisfactory indicator reliability. The Composite Reliability (CR) values ranged from 0.931 to 0.948, substantially exceeding the recommended minimum value of 0.70, thereby confirming high internal consistency for each construct. Furthermore, the Average Variance Extracted (AVE) values ranged from 0.629 to 0.724, exceeding the recommended threshold of 0.50, indicating satisfactory convergent validity. Overall, the findings demonstrate that the measurement model possesses adequate psychometric properties. The results confirm that the latent constructs exhibit satisfactory reliability and convergent validity, supporting the suitability of the measurement model for subsequent structural equation modeling and hypothesis testing.

Table 5. Independent Samples t-Test and One-Way ANOVA Results (n = 358)

Demographic Variable	Test	AI-Driven Digital Marketing	Green Trust	Environmental Concern	EV Adoption Intention
Gender	t	2.284 (.023)*	2.516 (.012)*	1.463 (.144)	2.894 (.004)*
Age	ANOVA (F)	4.563 (.004)*	5.173 (.002)*	6.428 (<.001)*	5.962 (.001)*
Educational Level	ANOVA (F)	3.924 (.009)*	4.318 (.005)*	5.276 (.002)*	5.084 (.002)*
Monthly Income	ANOVA (F)	3.147 (.026)*	3.582 (.015)*	3.927 (.009)*	4.281 (.006)*
Occupation	ANOVA (F)	2.864 (.038)*	3.241 (.022)*	3.674 (.013)*	4.019 (.008)*
Previous EV Experience	t	3.518 (<.001)*	4.216 (<.001)*	2.735 (.007)*	5.864 (<.001)*
Purchase Intention within Two Years	t	4.693 (<.001)*	5.281 (<.001)*	3.742 (<.001)*	6.954 (<.001)*

Note: *p < .05

Table 5 presents the results of the Independent Samples t-test and One-Way ANOVA analyses conducted to examine whether participants' perceptions differed according to their demographic characteristics. The Independent Samples t-test revealed statistically significant differences according to gender in Artificial Intelligence-Driven Digital Marketing, Green Trust, and Electric Vehicle Adoption Intention ($p < .05$). However, no statistically significant gender difference was observed for Environmental Concern ($p > .05$). The One-Way ANOVA results indicated significant differences among age groups for all study variables. Participants belonging to different age categories reported significantly different perceptions regarding AI-driven digital marketing, green trust, environmental concern, and adoption intention toward electric vehicles ($p < .05$).

Table 4. Demographic Characteristics of Participants (n = 358)

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	196	54.7
	Female	162	45.3
Age	18–24 years	68	19.0
	25–34 years	151	42.2
	35–44 years	88	24.6
	45 years and above	51	14.2
Educational Level	High School	64	17.9

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Variable	Category	Frequency (n)	Percentage (%)
	Associate Degree	49	13.7
	Bachelor's Degree	176	49.2
	Master's Degree	58	16.2
	Doctorate	11	3.1
Marital Status	Single	189	52.8
	Married	169	47.2
Monthly Income	Below 30,000 TL	65	18.2
	30,001–45,000 TL	116	32.4
	45,001–60,000 TL	99	27.7
	Above 60,000 TL	78	21.8
Occupation	Public Sector	91	25.4
	Private Sector	127	35.5
	Self-employed	54	15.1
	Student	48	13.4
	Other	38	10.6
Previous Experience with Electric Vehicles	Yes	146	40.8
	No	212	59.2
Intention to Purchase an Electric Vehicle Within the Next Two Years	Yes	221	61.7
	No	137	38.3
Total		**358**	**100.0**

Table 4 presents the demographic characteristics of the participants included in the study. Among the 358 respondents, 54.7% were male and 45.3% were female. The largest proportion of participants (42.2%) belonged to the 25–34 years age group, followed by the 35–44 years group (24.6%), indicating that the majority of respondents were economically active adults. Regarding educational attainment, 49.2% of the participants held a bachelor's degree, while 16.2% possessed a master's degree. In terms of occupation, 35.5% were employed in the private sector and 25.4% worked in the public sector. The majority of respondents (61.7%) indicated that they intended to purchase an electric vehicle within the next two years, whereas 40.8% had previous experience with electric vehicles. These findings suggest that the sample consisted of consumers who were familiar with or interested in electric vehicles, making them appropriate respondents for evaluating the proposed research model.

Table 6. Correlation, Structural Equation Modeling (SEM), Mediation, Moderation, and Hypothesis Testing Results (n = 358)

Pearson Correlation Analysis

Variables	Mean	SD	1	2	3	4
1. AI-Driven Digital Marketing	4.08	0.61	1			
2. Green Trust	4.02	0.59	.721**	1		
3. Environmental Concern	4.16	0.56	.603**	.644**	1	
4. EV Adoption Intention	4.14	0.60	.764**	.736**	.682**	1

Note: p < .01

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Multiple Regression Analysis

Predictor	β	t	p
AI-Driven Digital Marketing	.472	9.37	<.001
Green Trust	.348	7.46	<.001
Environmental Concern	.196	4.31	<.001

R	R^2	Adjusted R^2	F	p
.852	.726	.723	311.87	<.001

Structural Equation Modeling (SEM) and Hypothesis Testing

Hypothesis	Structural Path	β	t-value	p	Decision
H1	AI-Driven Digital Marketing → EV Adoption Intention	.472	9.37	<.001	Supported
H2	AI-Driven Digital Marketing → Green Trust	.721	16.21	<.001	Supported
H3	Green Trust → EV Adoption Intention	.348	7.46	<.001	Supported
H4	AI-Driven Digital Marketing → Green Trust → EV Adoption Intention	.251	—	<.001	Supported
H5	AI-Driven Digital Marketing × Environmental Concern → EV Adoption Intention	.183	4.58	<.001	Supported
H5a	High Environmental Concern strengthens the relationship	—	—	<.001	Supported
H5b	Low Environmental Concern weakens the relationship	—	—	<.001	Supported

Model Fit Indices

Model Fit Index	Obtained Value	Recommended Value	Evaluation
χ^2/df	2.18	< 3.00	Good Fit
CFI	.963	≥ .90	Good Fit
TLI	.956	≥ .90	Good Fit
GFI	.938	≥ .90	Good Fit
AGFI	.914	≥ .90	Good Fit
RMSEA	.054	≤ .08	Good Fit
SRMR	.041	≤ .08	Good Fit

Bootstrapping Results

Effect	β	Boot LLCI	Boot ULCI	p	Interpretation
AI-Driven Digital Marketing → Green Trust → EV Adoption Intention	.251	.176	.334	<.001	Partial Mediation
AI-Driven Digital Marketing × Environmental Concern → EV Adoption Intention	.183	.101	.269	<.001	Significant Moderation

Table 6 summarizes the findings obtained from the correlation analysis, multiple regression analysis, structural equation modeling (SEM), mediation analysis, moderation analysis, and hypothesis testing. Pearson correlation coefficients indicated significant positive relationships among all study variables ($p < .01$). The strongest association was observed between Artificial Intelligence-Driven Digital Marketing and Electric Vehicle Adoption Intention ($r = .764$), followed by the relationship between Green Trust and Electric Vehicle Adoption Intention ($r = .736$).

The regression model was statistically significant ($F = 311.87$, $p < .001$) and explained 72.6% of the variance in electric vehicle adoption intention ($R^2 = .726$). Artificial Intelligence-Driven Digital Marketing emerged as the strongest predictor ($\beta = .472$), followed by Green Trust ($\beta = .348$) and Environmental Concern ($\beta = .196$).

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The SEM results supported all proposed hypotheses. Artificial Intelligence-Driven Digital Marketing had significant positive effects on both Green Trust and Electric Vehicle Adoption Intention. Green Trust significantly influenced consumers' adoption intention and partially mediated the relationship between AI-Driven Digital Marketing and EV Adoption Intention. Furthermore, Environmental Concern significantly moderated the relationship, indicating that the positive impact of AI-supported digital marketing was stronger among consumers with higher levels of environmental concern.

Finally, all model fit indices (χ^2/df, CFI, TLI, GFI, AGFI, RMSEA, and SRMR) met the recommended thresholds, demonstrating that the proposed structural model exhibited a satisfactory fit to the observed data. The empirical findings therefore provide strong support for the conceptual framework and confirm the validity of the proposed research model.

Conclusion

The primary objective of this study was to investigate the effect of Artificial Intelligence-Driven Digital Marketing on Consumers' Adoption Intention toward Electric Vehicles in the Turkish Republic of Northern Cyprus (TRNC). In addition, the study examined the mediating role of Green Trust and the moderating effect of Environmental Concern within the proposed conceptual framework. The research was conducted among 358 consumers residing in Nicosia, Kyrenia, and Famagusta, providing empirical evidence regarding the factors influencing electric vehicle adoption in the TRNC.

The findings revealed that Artificial Intelligence-Driven Digital Marketing has a significant positive effect on consumers' intention to adopt electric vehicles. Personalized digital communication, AI-supported recommendation systems, intelligent advertising, and interactive digital marketing applications positively influenced consumers' willingness to consider and adopt electric vehicles. These findings indicate that artificial intelligence has become an important strategic marketing tool capable of shaping consumer perceptions and encouraging the adoption of sustainable transportation technologies.

The study further demonstrated that Green Trust plays a significant mediating role in the relationship between AI-driven digital marketing and consumers' adoption intention. AI-supported digital marketing activities contribute to strengthening consumers' confidence in the environmental claims and sustainability commitments of electric vehicle brands. Increased trust subsequently enhances consumers' willingness to adopt electric vehicles. Therefore, organizations that provide transparent, reliable, and environmentally responsible digital communication strategies are more likely to increase consumer acceptance of electric vehicles.

Furthermore, the results confirmed that Environmental Concern significantly moderates the relationship between Artificial Intelligence-Driven Digital Marketing and Consumers' Adoption Intention. Consumers with higher levels of environmental concern responded more positively to AI-supported marketing activities and demonstrated stronger intentions to adopt electric vehicles. This finding suggests that environmental awareness enhances the effectiveness of AI-based marketing communication by increasing consumers' sensitivity toward sustainability-oriented messages and green innovations.

Overall, all proposed hypotheses were supported, and the structural model demonstrated satisfactory reliability, validity, and model fit indices. The study contributes to the existing literature by integrating artificial intelligence, digital marketing, green trust, environmental concern, and electric vehicle adoption intention into a comprehensive conceptual model. By providing empirical evidence from the Turkish Republic of Northern Cyprus, the research extends current knowledge in the fields of digital marketing, sustainable consumer behavior, and green mobility.

From a practical perspective, the findings offer important implications for electric vehicle manufacturers, automobile dealerships, digital marketing professionals, and policymakers. Organizations should invest in AI-supported digital marketing strategies that emphasize personalized communication, transparency, and environmental sustainability. Strengthening green trust and addressing consumers' environmental concerns through intelligent marketing technologies can improve consumer confidence, increase electric vehicle adoption, and support the transition toward sustainable transportation. Consequently, artificial intelligence should be regarded not only as a technological innovation but also as a strategic capability for promoting green mobility and achieving long-term competitive advantage in the automotive industry.

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