

Influence of Digital Marketing Practices on Customer Interest and Adoption of Green Startups, Eco-Innovations, and Electric Vehicle Charging Stations

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ABSTRACT

The increasing emphasis on environmental sustainability has accelerated the development of green startups, eco-innovations, and electric vehicle (EV) charging infrastructure. In this context, digital marketing practices have emerged as important mechanisms for enhancing environmental awareness, generating customer interest, and encouraging the adoption of sustainable products and services. This study examines the influence of digital marketing practices on customer interest and adoption of green startups, eco-innovations, and electric vehicle charging stations. Specifically, it investigates how digital marketing activities and sustainability-oriented online communication contribute to customer engagement, perceptions of environmental value, and adoption intentions. A quantitative research design was employed, and data were collected from 392 respondents using a random sampling method. The sample comprised 212 female and 180 male respondents. The age distribution included 188 respondents aged 20–25 years, 124 aged 25–30 years, 54 aged 30–35 years, and 26 aged above 35 years. Partial Least Squares Structural Equation Modelling (PLS-SEM) was used to analyse the relationships among the study constructs and evaluate the proposed hypotheses. The study aims to establish the role of digital marketing practices in stimulating customer interest and facilitating the adoption of sustainable business initiatives and environmentally friendly innovations. The findings are intended to provide insights into how digital platforms can support green entrepreneurship, strengthen customer engagement with eco-innovations, and promote the use of EV charging infrastructure. The study offers practical implications for green startups, sustainability-focused enterprises, EV charging service providers, and digital marketing practitioners seeking to develop effective communication strategies that align environmental awareness with customer adoption behaviour. By connecting digital marketing with sustainable innovation, this research contributes to the growing literature on green consumer behaviour and the role of digital technologies in advancing sustainable business development.

Keywords: Digital Marketing Practices, Customer Interest, Adoption Behaviour, Green Startups, Eco-Innovations, Electric Vehicle Charging Stations, Sustainability, Green Consumer Behaviour

1. INTRODUCTION

The rise of green startups has changed what it means to be an entrepreneur by making sustainability a part of business models. This has helped the economy grow while also addressing important environmental issues (Sharma & Subba, 2025). The growing concern over environmental degradation, climate change, resource depletion, and unsustainable consumption has increased the importance of green entrepreneurship and environmentally responsible business practices. Green startups have emerged as an important component of sustainable economic development by developing products, services, and business models that seek to reduce environmental impacts while creating economic and social value. These enterprises often focus on renewable energy, waste management, sustainable

agriculture, eco-friendly packaging, green mobility, and environmentally responsible consumer products. However, despite the increasing emphasis on sustainability, green startups frequently face challenges in attracting customers, building market awareness, establishing credibility, and competing with conventional businesses. In this context, digital marketing has become a strategic mechanism for communicating sustainability-related value propositions and reaching potential customers.

Digital marketing refers to the use of digital platforms and technologies, including social media, search engines, websites, email campaigns, online advertising, and content marketing, to promote products and services and establish relationships with customers. Compared with conventional marketing approaches, digital marketing

provides opportunities for targeted communication, interactive engagement, rapid information dissemination, and performance measurement. These capabilities may be particularly valuable for green startups, which often operate with limited promotional budgets and need to communicate the environmental benefits of their products to specific customer segments. Through digital storytelling, educational content, customer testimonials, and online communities, green startups can communicate their sustainability initiatives and differentiate themselves in competitive markets. Nevertheless, the effectiveness of digital marketing depends not only on the reach of promotional campaigns but also on the credibility, relevance, and clarity of the information communicated to consumers.

Customer awareness represents an important factor in the acceptance and market development of environmentally sustainable products and services. It encompasses consumers' knowledge and understanding of product characteristics, environmental benefits, sustainability practices, and the broader implications of purchasing decisions. Greater awareness may enable customers to identify environmentally responsible alternatives, evaluate sustainability claims, and recognise the value offered by green startups. Digital marketing can contribute to this process by disseminating information, educating consumers about environmental issues, and encouraging engagement with sustainable brands. However, awareness does not automatically translate into purchasing behaviour or business success. Factors such as price, product availability, perceived quality, customer trust, convenience, and the credibility of environmental claims may influence whether customer awareness results in actual market demand. The relationship between digital marketing and green startup development therefore requires a more comprehensive examination. Although digital marketing may improve customer visibility and awareness, its direct contribution to green startup outcomes may depend on the extent to which promotional activities generate meaningful customer engagement, purchasing decisions, and sustained market acceptance. Green startups may invest in online advertising and social media campaigns without necessarily achieving corresponding business outcomes if their marketing strategies fail to address customer needs or communicate credible environmental benefits. Consequently, it is important to distinguish between the direct relationship of digital marketing with green startups and its potential indirect relationship through customer awareness. Examining these pathways can provide insights into how digital marketing activities may contribute to the market positioning and development of environmentally oriented enterprises.

India is a great example of this shift toward sustainable entrepreneurship. It has become a global hub for startups, with more than 90,000 recognized businesses and 107 unicorns, thanks in large part to its young people (Phani et al., 2024). Green entrepreneurship is very important for solving social problems and protecting the environment because it helps the economy grow steadily over time (Nair & Das, 2025). In this situation, the electric vehicle industry has become a center for new ideas. Companies in

Karnataka, like Ather Energy and Ola Electric, are helping people adopt electric vehicles by using new business models and building charging infrastructure (Tiwari, 2023). But for this ecosystem to grow, it needs a lot of smart investments and partnerships. For example, Fortum India plans to build 720 charging stations in seven cities, and a joint venture between EV motors, DLF, and ABB India wants to build 6,500 stations (Singh & Singh, 2020). Even with these improvements, there are still big problems with getting people to buy electric cars, such as gaps in how people see them and the need for strong charging networks to support long-term mobility solutions (Bhatnagar et al., 2022; Tiwari, 2023). To overcome these obstacles, supportive mechanisms like green incubators, accelerators, and eco-innovation hubs are crucial for offering the mentorship, seed funding, and collaborative infrastructure necessary for sustainable ventures to scale efficiently (Al-Adwan et al., 2021). This research focuses on the ecosystem in Mysore, Karnataka, to analyze how local green startups are managing the intricacies of battery charging infrastructure and eco-innovation within the national context (Pais, 2025; Sawamura, 2021). The literature review integrates theoretical frameworks concerning green entrepreneurship, business model innovation, and the pivotal function of charging infrastructure within the electric vehicle ecosystem. Green entrepreneurship refers to the creation of business ventures that intentionally aim to harmonize profitability with environmental stewardship, thereby integrating sustainability as a fundamental aspect of the value proposition (Maulidian et al., 2024). These ventures are not limited to industries but encompass diverse sectors of the economy, with a notable concentration of projects in renewable energy and waste management (Kosorukova et al., 2023). Recent research has broadened this area to include the electric vehicle industry, where new business models and infrastructure development are necessary to break down barriers to adoption and reach sustainable development goals (Olurina et al., 2023; Umasankar et al., 2023). One of the most important ways to fight climate change is to switch from internal combustion engine vehicles to electric vehicles. However, getting people to buy electric vehicles is still a big problem, even with technological advances and government incentives (Srinivasan, 2025). One of the main problems that stops a lot of people from using electric vehicles is that there aren't enough charging stations, which makes people worry about running out of power and makes electric vehicles less useful for consumers (Umasankar et al., 2023; Yadav et al., 2024). To get past these problems and get more people to use them, it's important for everyone involved, like governments, manufacturers, and energy providers, to work together to create a strong ecosystem that supports sustainable mobility solutions (Narendiran & Vetrivel, 2024). To make this ecosystem a good place for innovation, it needs a lot of different things, such as policy support, access to green finance, and the building of specialized infrastructure (Al-Adwan et al., 2021; Prokopenko et al., 2024). To effectively address national-level concerns about sustainable mobility, the use of electric vehicles and e-mobility services requires cooperation between many different industries, such as

electricity supply, transportation, and smart city development (Sawamura, 2021). The comprehensive advancement of this ecosystem transcends vehicle production to include a variety of stakeholders, including charging infrastructure providers, battery suppliers, regulatory authorities, and environmentally conscious consumers (Lastras, 2023). As a result, the successful integration of electric mobility depends on these groups working together to get around problems with interoperability, grid capacity, and the cost-effectiveness of charging networks (Dehkordi et al., 2024; Gouveia et al., 2024). Additionally, the lack of a substantial number of electric vehicles (EVs) frequently leads to minimal incentives for private entities to invest in infrastructure, resulting in a "chicken-and-egg" conundrum that impedes market advancement (Rojas, 2022). Researchers say that the only way to get past this deadlock is to come up with new business models that help companies make money and successfully market new technologies (Ziegler & Abdelkafi, 2021). When it comes to charging stations for electric vehicles, new business models are especially important for solving the "chicken-and-egg" problem by making sure that investments in charging stations stay profitable even before EV adoption reaches mass-market levels (Bhardwaj et al., 2025). This means that infrastructure operators, mobility service providers, and energy companies need to work together to create a business ecosystem that can keep running during the early stages of market diffusion (Haidar, 2021; Rojas, 2022). Government policies are important for breaking this deadlock because they give money and support to new value propositions. However, companies must show that they can make money without public funding (Ziegler & Abdelkafi, 2021). A business model explains how a business makes and delivers value to customers by showing how it makes money, spends money, and makes profits (Ianniello et al., 2016). In the electric vehicle sector, this logic must address the complex interdependencies between infrastructure availability and vehicle adoption, often referred to as the "chicken-and-

egg" dilemma, where the lack of charging points discourages EV purchases while the low number of EVs makes infrastructure investment unattractive (Haidar, 2021; Ziegler & Abdelkafi, 2021). A business model is often looked at from many angles, with researchers separating the value proposition, the value network, and the revenue or cost model as separate but related parts.

2. LITERATURE REVIEW

The idea of a business model is often looked at from many different angles. For example, Ziegler and Abdelkafi (2021) say that the value proposition, the value network, and the revenue or cost model are all different but related parts of a business model. For example, business models for battery second use could offer better ways to manage the lifespan of EV batteries, which would help with environmental issues related to disposal and save customers money (Dehkordi et al., 2024). Studies show that successful business models in this field can't be built on isolated, actor-focused ideas. Instead, they need systemic coordination that involves many different actors in the mobility ecosystem (Ziegler & Abdelkafi, 2021). This ecosystemic perspective underscores that established companies and entrepreneurial initiatives frequently demonstrate path-dependent behaviours that shape the development of electric vehicle business models, requiring unique strategies to surmount obstacles to market entry (Bohnsack et al., 2013). Recent research indicates that innovative business models can facilitate the removal of obstacles to electric vehicle adoption and promote the transition of commercial fleets towards a more sustainable framework (Dehkordi et al., 2024). To put these models into action, scholars stress that a business model must be seen as a complete picture of how a company creates and captures value within a value network, with the value proposition being the most important part that sets the offering apart from competitors (Reinhardt et al., 2020).

3. RESEARCH FRAMEWORK.

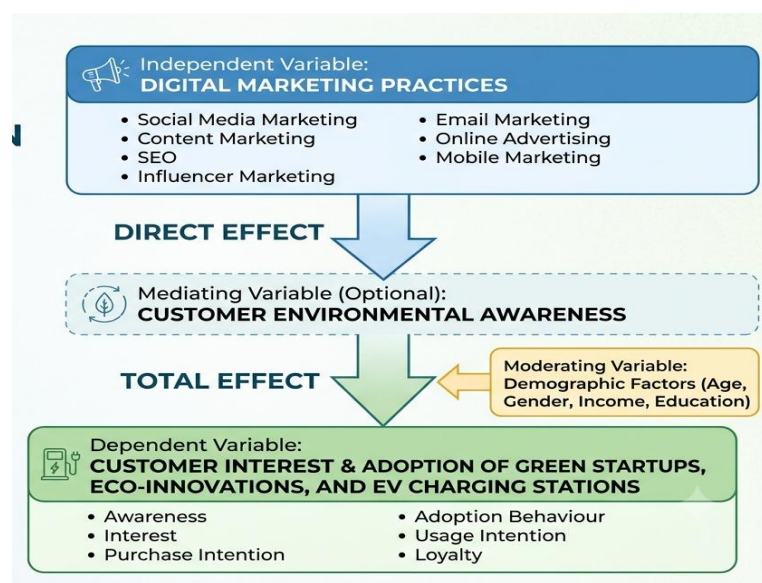


Figure 1. Proposed Research Framework: Influence of Digital Marketing Practices on Customer Interest and Adoption of Green Startups, Eco-Innovations, and Electric Vehicle Charging Stations

According to the Figure 1, the proposed conceptual framework illustrates the relationship between Digital Marketing Practices and Customer Interest and Adoption of Green Startups, Eco-Innovations, and Electric Vehicle Charging Stations. The framework is grounded in consumer behavior and digital marketing theories, highlighting how digital communication channels influence customer awareness, interest, purchase intentions, and adoption behavior toward sustainable products and services.

The independent variable, *Digital Marketing Practices*, consists of seven major dimensions: Social Media Marketing, Content Marketing, Search Engine Optimization (SEO), Influencer Marketing, Email Marketing, Online Advertising, and Mobile Marketing. These digital marketing tools play a significant role in disseminating information, creating awareness, engaging customers, and influencing perceptions regarding environmentally sustainable products and services.

The framework proposes a direct effect of digital marketing practices on the dependent variable, namely *Customer Interest and Adoption of Green Startups, Eco-Innovations, and Electric Vehicle Charging Stations*. Customer interest and adoption are measured through six dimensions: awareness, interest, purchase intention, adoption behavior, usage intention, and loyalty. Effective digital marketing strategies are expected to positively influence these customer outcomes by providing relevant information, enhancing perceived value, and fostering trust in green innovations.

Further, the model incorporates Customer Environmental Awareness as a mediating variable. Environmental awareness reflects an individual's understanding of environmental issues and commitment toward sustainable consumption. The framework suggests that digital marketing practices not only directly influence customer adoption but also indirectly affect adoption by increasing environmental awareness. Customers who possess higher levels of environmental consciousness are more likely to develop favorable attitudes and behavioral intentions toward green startups and eco-friendly technologies.

Additionally, Demographic Factors such as age, gender, income, and education are included as a moderating variable. These demographic characteristics may influence the strength and direction of the relationship between environmental awareness and customer adoption behavior. For instance, younger and more educated consumers may be more receptive to digital marketing messages and sustainability initiatives compared to other demographic groups. The framework demonstrates that digital marketing practices serve as a critical driver in shaping customer perceptions and encouraging the adoption of sustainable business models and technologies. The integration of mediating and moderating variables provides a comprehensive understanding of the mechanisms through which digital marketing contributes to the growth of green startups, eco-innovations, and electric vehicle charging infrastructure.

Background of using EV Scooters in India:

Electric scooters are becoming more popular in India as a key part of the country's plan to cut down on urban pollution and reliance on fossil fuels. This is thanks to

government incentives and new business models that fill in gaps in infrastructure (Shukla et al., 2014). The Indian government is committed to the Paris Climate Agreement and is giving money to promote electric vehicles to cut down on CO2 emissions. However, the actual rate of adoption is still slow because of ongoing problems (Patel et al., 2024). High upfront costs, a lack of charging stations, and concerns about battery range and safety are the main barriers. To get around these problems, strong business models need to be created that can effectively reduce these risks for potential users (Sawamura, 2021; Zang et al., 2024). To better understand how a product might spread and what infrastructure and services are needed to support it, we need to know about things like government policy, rules, the current level of needed infrastructure, and the availability of related services (Sawamura, 2021). Government policies and regulations are very important in shaping the market environment. For example, India's relaxation of rules on foreign direct investment and the provision of incentives to encourage output and lower pollution levels (Umasankar et al., 2023) show this. However, studies show that Indian consumers are more interested in the future policy roadmap and the availability of post-purchase maintenance support than in immediate financial incentives (Halsnaes et al., 2023). This means that the response to these subsidies has been limited. To make electric mobility work in India, all the people involved, such as manufacturers, energy providers, and policymakers, need to work together to build strong infrastructure and set standards for charging and battery swapping services (Narendiran & Vetrivel, 2024; Patel et al., 2024). The installation of electric charging infrastructure is seen as one of the most important things for the spread of EVs and e-mobility services. This makes it very important to look at the electricity supply infrastructures in Indian cities, since the lack of electricity supply is a big part of the local context (Sawamura, 2021). Also, the infrastructure is not good enough right now because India only has 12,146 public charging stations for about 3.4 million electric cars (Tolani et al., 2025). This big difference between the number of cars and the number of charging stations shows how infrastructure problems are slowing down widespread adoption. This is especially true when you think about the extra problems that consumers face in price-sensitive markets, such as high upfront costs and range anxiety (Bansal et al., 2021; Halsnæs et al., 2023). To fix these problems with infrastructure, the Indian government has said that 63,000 charging units will be needed and that the total cost will be Rs. 26,900 crores over the next five years. This shows how important it is for public-private partnerships to help with infrastructure development (Tolani et al., 2025). Charge Point Operators like Tata Power EZ Charge, Charge Zone, and Magenta ChargeGrid are also involved in the private sector. They are important for setting up and running the charging networks that are needed (Sathyan et al., 2024). Even with these efforts, the current charging stations' logistical efficiency is still a big problem. For example, petrol stations can serve about 20 cars in 30 minutes, but EV stations can only serve one car in the same amount of time (Sathyan et al., 2024).

Problems facing due to EV Sectors

Ola Electric is a good example of the problems with infrastructure and operations in the Indian EV sector, especially when it comes to the lack of charging networks and the high total cost of ownership that makes it hard for many people to use EVs (Wagh, 2024). Ola's pilot project in Nagpur shows how hard it is for shared mobility companies to run their businesses. The project had high recharging costs and long wait times, even though there was only one charging station for every 17 cars. This made drivers switch from electric vehicles to diesel vehicles (Umasankar et al., 2023). This case exemplifies the pivotal "chicken-or-egg" conundrum, wherein investors are reluctant to develop infrastructure in the absence of adequate vehicle quantities, while consumers are hesitant to embrace electric vehicles due to insufficient refueling stations (Bhosale et al., 2019; Nafde, 2024). This lack of infrastructure is made worse by the fact that charging stations need a lot more space than regular gas stations and each public station needs about 100 kW of power (Sathyan et al., 2024). To keep the service stable and reliable, the existing electrical grid capacity needs to be greatly increased because of these high power needs (Muthulakshmi et al., 2023; Shree et al., 2024). Also, the high cost of urban land and the lack of clear ownership make it harder to plan and maintain parking lots that are needed for charging infrastructure (Darak & Bhanushali, 2022). Also, range anxiety is a big psychological barrier that affects how people feel about their cars. As battery capacity decreases over time, owners have to constantly check dashboard indicators and change their travel plans to account for unexpected route changes (Muthulakshmi et al., 2023). To address operational inefficiencies and consumer apprehensions, the introduction of smart and intelligent charging systems has been suggested as an effective means to optimize energy consumption and improve the user experience (Gulzar et al., 2024). Smart charging systems use advanced algorithms and communication technologies to dynamically manage power loads based on grid capacity and user needs. This keeps the network from becoming overloaded and makes sure that vehicles charge reliably (Sathyan et al., 2024). These systems make it easier to use renewable energy sources and allow vehicles to connect to the grid (V2G), which lets electric vehicles send stored energy back to the grid when demand is high. This makes the grid more stable overall and cuts down on the need for costly infrastructure upgrades (Mahmoud et al., 2024). Scholars propose that enhancing power resource allocation via smart grids and energy management systems can significantly alleviate this challenge (Li, 2024). Intelligent charging management systems can optimize EV charging schedules, smooth out demand peaks, and make sure the grid stays reliable as the switch to electric transportation speeds up (Aoun et al., 2024). The incorporation of renewable energy sources into charging infrastructure is in line with global sustainability objectives, as stations powered by solar or wind energy play a crucial role in diminishing the overall carbon footprint of electric mobility (Etukudoh et al., 2024). However, the widespread use of electric vehicles (EVs) also brings up big problems with the availability and accessibility of charging stations, which are very important for making

charging easy and quick for EV owners (Mohammed et al., 2024).

SUSTAINABLE EV SCOOTER MODEL

The idea behind the sustainable EV scooter is to use a closed loop system that starts by making clean, renewable energy, mostly from solar and wind sources. After that, the energy goes to the grid and charging stations. This clean energy is used to make electric scooters in a way that is good for the environment. They use modular design ideas, eco-friendly production methods, and machines that use less energy to lower carbon emissions, waste, and damage to the environment. The scooters have new battery management systems, lightweight parts, and electric drivetrains that make them better at what they do and use less energy. Once they are made, the EV scooters can use a well-known charging network that includes home charging units, public charging stations, and, when possible, places where you can change the batteries. Smart charging systems manage the flow of energy, stop batteries from being overcharged, and keep them in good shape. Regenerative braking systems, on the other hand, get kinetic energy back as the car slows down, which makes them even more efficient. Because they don't have tailpipe emissions, are quiet, and are cheap to use in cities, EV scooters are great for short trips, shared transportation services, and last-mile delivery. During the use phase, digital tools such as IoT sensors, mobile apps, and data analytics platforms keep an eye on things like how well the vehicle is running, how much energy it uses, how healthy the battery is, and how people ride it. With this real-time data, you can do predictive maintenance, find the best routes, and use energy more efficiently. This makes the scooter last longer and reduces the number of times it breaks down unexpectedly. Taking care of the product regularly and replacing modular parts will make it last longer and use fewer resources, which will also make it cheaper to fix. The method puts a lot of emphasis on circular economy ideas by using systematic end-of-life management at the end of the product's useful life. Batteries can be reused for things like storing energy in a stationary way, or they can be sent to be recycled in a way that is good for the environment. Parts that can be used again are taken out of the production cycle and put back in. We use data on how much people use, maintain, and recycle things to make products better, make rules, and build infrastructure. This makes feedback loop for sustainability that never ends. This closed-loop method makes sure that urban transportation systems that use electric scooters have less of an effect on the environment, use resources more efficiently, and last for a long time.

Case of Electric Scooter / EV Two-Wheeler Production & Sales in Mysore:

EV Adoption & Registrations: There has been a big rise in the number of electric vehicles (EVs) registered in Mysuru, especially electric scooters. This means that a lot of people want them in the area. In Mysuru East RTO, 1,424 electric cars had been registered for the 2025–26 fiscal year by the middle of January 2026. This is about 16% more than last year. A lot of them are scooters that run on electricity. In the last few years, thousands of electric two-wheelers and four-wheelers have also been

registered in other parts of the city besides Mysuru. This shows that two-wheeled electric vehicles are the most popular in the area. Brand Presence and Sales Channels: Ather Energy, one of India's most well-known electric scooter makers, has opened Ather Space, a retail experience center, in Mysore on Hunsur Road, Hinkal. This center sells popular models like the Ather 450X and Ather 450 Plus. You can also test ride them there. There are experience centers like this in the city because there is a need for EV scooters. These centers give customers a place to buy them and get help. There isn't any specific information about EV scooter factories in Mysore city itself; they are in Mysuru. There are big plans in Karnataka to make electric vehicles (EVs). For example, Honda Motorcycle & Scooter India wants to make a lot of EVs at its Narsapura facility. Over the next ten years, these plans will probably have a big effect on the area's EV ecosystem. Mysore has charging stations and battery infrastructure for electric vehicles: Charging stations for electric vehicles in public: As the number of cars in Mysuru has grown, so has the city's EV charging network: The city has several places where people can charge their phones and get quick charges. For instance, Ather Energy has its own fast chargers called Ather Grid stations. These stations can be found in important places like Hinkal, Nazarbad Mohalla, Gokulam Road, and Vijaya Nagar. These make it simple to charge Ather scooters while you're on the go. There is a charging station at Dyuthi Automobiles on Hunsur Road that can charge quickly, like Bharat DC chargers that have 15–50 kW of power. Mysuru's overall AV charging ecosystem includes many more licensed charging sites run by the Chamundeshwari Electricity Supply Corporation (CESC) in addition to brand-specific networks. These sites add to the area's charging points. CESC recently built a 30 kV

fast charging station for electric cars at its office and is thinking about letting the public use it. Battery Changing / Swapping Stations: Right now, there aren't many places in Mysore where riders can trade in a dead battery for a charged one. Major OEMs like Honda have national and state EV plans that talk about building battery-swapping infrastructure in important places like gas stations and public transportation areas. However, these are more general plans for Karnataka and India as a whole, and they are not yet fully operational in Mysore. Most of the equipment that is already in Mysore is for permanent public charging stations, not full battery-swap hubs.

DATA ANALYTICS

This analysis integrates the demographic profile of 392 respondents, the PLS-SEM structural model, the coefficient of determination (R^2), hypothesis testing, measurement-model reliability and validity, and the potential mediating role of Customer Awareness.

RESEARCH METHODOLOGY AND SAMPLE PROFILE

Sampling method and sample size: The study collected data from 392 respondents using a random sampling method. The collected responses were analysed to examine the relationships between Digital Marketing, Customer Awareness, and Green Startups.

The data analysis employs Partial Least Squares Structural Equation Modelling (PLS-SEM) to evaluate the hypothesised relationships between the constructs, assess explanatory power, and examine the reliability and validity of the measurement model.

The demographic characteristics of the respondents are summarised below

Table 1: Gender distribution

Gender	Number of respondents	Percentage
Female	212	54.08%
Male	180	45.92%
Total	392	100.00%

From table 1, Female respondents account for 54.08% of the total sample, while male respondents account for

45.92%. Thus, female respondents constitute the larger reported gender group

Table 2: Age distribution of respondents

Age group	Number of respondents	Percentage
20–25 years	188	47.96%
25–30 years	124	31.63%
30–35 years	54	13.78%
Above 35 years	26	6.63%
Total	392	100.00%

AGE DISTRIBUTION OF RESPONDENTS

From table 2, Distribution of 392 respondents across four age groups. The age distribution indicates that the largest group of respondents belongs to the 20–25-year age category, comprising 188 respondents (47.96%). The second-largest group is the 25–30-year category, accounting for 124 respondents (31.63%). Together, these two younger age groups represent 79.59% of the sample. Respondents aged 30–35 years account for 13.78%, while

those above 35 years constitute 6.63%. This distribution indicates that the sample predominantly represents younger respondents. Their perspectives may be particularly relevant to the study of digital marketing because younger consumers may have substantial exposure to digital communication channels. However, the demographic data alone do not establish their actual digital marketing usage or environmental preferences. The findings should therefore be interpreted with due

consideration of the sample's age composition when generalising the results to broader consumer populations.

Structural Model Assessment

The structural model examines three hypothesised relationships:

Digital Marketing → Customer Awareness

Customer Awareness → Green Startups

Digital Marketing → Green Startups

The model evaluates whether Digital Marketing is associated with Customer Awareness and whether both constructs explain variations in Green Startups.

Coefficient of determination (R^2)

Table 3: Coefficient of determination

Endogenous construct	R^2	Adjusted R^2	Variance explained
Customer Awareness	0.790	0.790	79.0%
Green Startups	0.929	0.929	92.9%

From table 3, The R^2 value for Customer Awareness is 0.790, indicating that Digital Marketing explains 79.0% of the variance in Customer Awareness within the estimated model. This represents substantial explanatory power and suggests that Digital Marketing is strongly associated with customer awareness.

The R^2 value for Green Startups is 0.929, indicating that Digital Marketing and Customer Awareness jointly

explain 92.9% of the variance in Green Startups. The remaining 7.1% is unexplained by the predictors included in the model.

These results suggest that the proposed model has substantial explanatory power. Nevertheless, a high R^2 value does not independently establish causal relationships, overall model fit, or out-of-sample predictive performance.

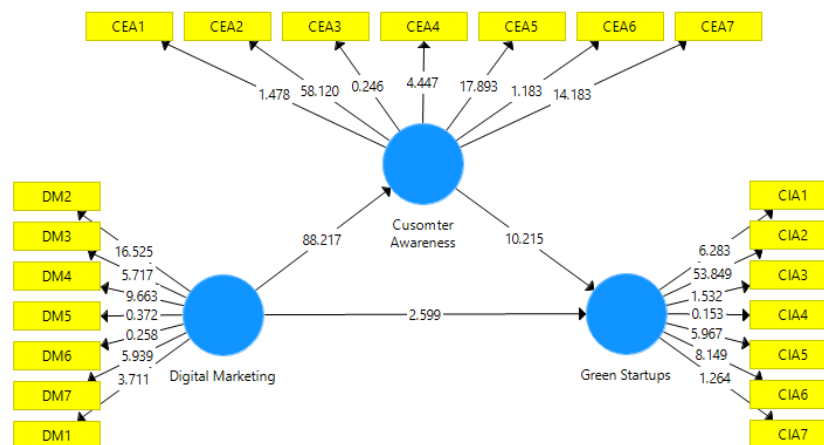


Figure 2: PLS-SEM Results: Digital Marketing, Customer Awareness, and Green Startups

Interpretation of the PLS-SEM Results: Digital Marketing, Customer Awareness, and Green Startups

From figure 2, The PLS-SEM results examine the influence of Digital Marketing on Customer Awareness and Green Startups, as well as the effect of Customer Awareness on Green Startups. The interpretation covers the structural model, explanatory power (R^2), path significance, and measurement model reliability and validity.

Hypothesis Testing and Path Coefficients

The significance of the hypothesised relationships is evaluated using the path coefficients, t-statistics, and p-values. At the 5% significance level, all three reported structural paths are statistically significant

Table 4: Hypothesised Relationship

Hypothesised relationship	β (Original Sample)	t-statistic	p-value	Decision
Digital Marketing → Customer Awareness	0.889	88.217	0.000	Supported
Customer Awareness → Green Startups	1.310	10.215	0.000	Supported
Digital Marketing → Green Startups	-0.409	2.599	0.010	Supported, negative effect

Note: A reported p-value of 0.000 should be written as $p < 0.001$, rather than interpreted as literally zero.

Digital Marketing → Customer Awareness

From table 4, The relationship between Digital Marketing and Customer Awareness is positive and statistically

significant ($\beta = 0.889$, $t = 88.217$, $p < 0.001$). The large positive path coefficient indicates that higher levels of digital marketing are associated with higher levels of customer awareness, holding the model's other relevant relationships constant.

This finding suggests that digital marketing may be an important mechanism for improving awareness of green products, sustainability initiatives, and environmentally responsible business practices. Digital communication channels can help green startups disseminate information, reach target audiences, and communicate their environmental value propositions.

Therefore, the hypothesis that Digital Marketing positively influences Customer Awareness is supported.

Customer Awareness → Green Startups

Customer Awareness has a positive and statistically significant relationship with Green Startups ($\beta=1.310$, $t=10.215$, $p<0.001$). The coefficient indicates a strong positive association between customer awareness and the Green Startups construct as specified in the model.

This finding suggests that when customers are more aware of green products, sustainable business models, and environmental benefits, green startups may be better positioned to gain customer interest, market acceptance, and business support.

However, the standardised path coefficient exceeds 1.00. Although this is not automatically invalid, it is unusual and warrants further examination. Potential causes include multicollinearity, suppression effects, overlapping constructs, or measurement-model problems. The coefficient should therefore be interpreted cautiously until these possibilities are assessed.

The hypothesis that Customer Awareness positively influences Green Startups is statistically supported, subject to this diagnostic qualification.

Digital Marketing → Green Startups

Digital Marketing has a negative and statistically significant direct relationship with Green Startups ($\beta=-0.409$, $t=2.599$, $p=0.010$). This indicates that, after accounting for Customer Awareness, higher Digital Marketing scores are associated with lower Green Startups scores through the direct path in the estimated model.

This negative coefficient does not necessarily mean that digital marketing is harmful to green startups overall. It may indicate a competitive or suppressor relationship in which the direct effect differs from the indirect effect operating through Customer Awareness.

For example, digital marketing activities may contribute positively to customer awareness, while the direct

relationship with the Green Startups construct becomes negative after customer awareness is included in the model. This could reflect resource constraints, ineffective conversion of online engagement into business outcomes, or statistical suppression. These are possible explanations rather than established findings.

Accordingly, the hypothesis that Digital Marketing has a positive direct influence on Green Startups is not supported. The estimated direct relationship is instead negative and significant.

Indirect Effect of Digital Marketing through Customer Awareness

The structural model also suggests that Customer Awareness may mediate the relationship between Digital Marketing and Green Startups.

The indirect effect can be estimated by multiplying the two relevant path coefficients:

$$("Indirect Effect" \&=0.889 \times 1.310 \&=1.165)$$

The estimated indirect effect is approximately +1.165, whereas the direct effect of Digital Marketing on Green Startups is -0.409.

The implied total effect is:

$$("Total Effect" \&="Direct Effect" + "Indirect Effect" \&=-0.409+1.165 \&=0.756)$$

This pattern suggests that Digital Marketing may have a positive overall relationship with Green Startups through Customer Awareness, despite its negative direct relationship.

However, these are calculated effects based on the reported path coefficients. The indirect effect's statistical significance must be established using bootstrapping of the specific indirect effect, including its confidence interval and p-value. Until this test is performed, mediation should be described as a potential mediation effect, not a confirmed result.

If the indirect effect is statistically significant and the direct effect remains significant in the opposite direction, the pattern may indicate competitive mediation.

Measurement Model Assessment: Reliability and Convergent Validity

The measurement model is assessed using Cronbach's alpha, rho_A, composite reliability (CR), and average variance extracted (AVE)

Table 5: Reliability and Convergent Validity

Construct	Cronbach's alpha	rho_A	Composite reliability	AVE
Customer Awareness	0.623	0.780	0.432	0.332
Digital Marketing	0.728	0.704	0.168	0.269
Green Startups	0.612	0.745	0.408	0.322
Recommended reference	$\geq 0.70^*$	$\geq 0.70^*$	$\geq 0.70^*$	≥ 0.50

*Common guidelines; exploratory research may permit lower internal-consistency values in some circumstances. Internal consistency reliability: From table 5, Digital Marketing demonstrates acceptable Cronbach's alpha (0.728), suggesting reasonable internal consistency under the commonly used 0.70 guideline. Customer Awareness (0.623) and Green Startups (0.612) have alpha values below 0.70. These values indicate relatively modest

internal consistency and warrant further assessment, although lower values may sometimes be accepted in exploratory research. The rho_A values range from 0.704 to 0.780, meeting the commonly used 0.70 reference point. Nevertheless, these values do not resolve the concerns raised by the composite reliability and AVE results. Important data-verification issue: The reported composite reliability values of 0.432, 0.168, and 0.408 are unusually low, particularly the Digital Marketing value of

0.168 given its Cronbach's alpha of 0.728. Please verify the SmartPLS output and confirm that the values have been copied from the correct columns.

Findings

The research indicates that green enterprises and eco-innovation initiatives significantly influence the electric transportation ecosystem in Mysore, Karnataka. Based on the analysis of 392 respondents and the PLS-SEM results, the following findings were identified regarding the relationships between Digital Marketing, Customer Awareness, and Green Startups. The path coefficient is positive and statistically significant ($\beta=0.889$, $t=88.217$, $p<0.001$). This indicates a strong positive association between digital marketing activities and customer awareness. Digital platforms may help green startups communicate their products, environmental benefits, and sustainability initiatives to potential customers. Customer Awareness significantly relates to Green Startups. The relationship is positive and statistically significant ($\beta=1.310$, $t=10.215$, $p<0.001$). This suggests that customer awareness may be associated with stronger green startup outcomes. However, the coefficient exceeding 1.00 requires further investigation of collinearity, suppression effects, and measurement validity. Digital Marketing has a negative direct relationship with Green Startups. The estimated path coefficient is -0.409 , with a t-statistic of 2.599 and a p-value of 0.010. Thus, the direct relationship is statistically significant but negative after accounting for Customer Awareness. This finding suggests that digital marketing activity alone may not necessarily translate into improved green startup outcomes. The model demonstrates substantial explanatory power. The R^2 value for Customer Awareness is 0.790, indicating that Digital Marketing explains 79.0% of its variance. The R^2 value for Green Startups is 0.929, indicating that Digital Marketing and Customer Awareness jointly explain 92.9% of its variance. Customer Awareness may act as a mediating variable. Based on the reported coefficients, the calculated indirect effect of Digital Marketing on Green Startups through Customer Awareness is approximately +1.165, compared with a direct effect of -0.409 . This pattern suggests a potential indirect pathway, but mediation cannot be confirmed until the specific indirect effect is tested using bootstrapping. Internal consistency requires further assessment. Cronbach's alpha is 0.728 for

Digital Marketing, 0.623 for Customer Awareness, and 0.612 for Green Startups. Digital Marketing meets the commonly used 0.70 threshold, while the other two constructs show relatively modest internal consistency. Convergent validity is not established satisfactorily. The AVE values are 0.269 for Digital Marketing, 0.332 for Customer Awareness, and 0.322 for Green Startups. All are below the commonly recommended threshold of 0.50. Composite reliability values need verification. The reported values—0.168 for Digital Marketing, 0.432 for Customer Awareness, and 0.408 for Green Startups—are unusually low and inconsistent with some of the other reliability estimates. The original SmartPLS output should be checked before final conclusions are drawn.

CONCLUSION:

The study provides evidence of significant relationships among Digital Marketing, Customer Awareness, and Green Startups. Digital Marketing is positively associated with Customer Awareness, while Customer Awareness is positively associated with Green Startups. However, Digital Marketing exhibits a negative direct relationship with Green Startups when Customer Awareness is included in the model. The findings highlight the potential importance of customer awareness in connecting digital marketing activities with green startup outcomes. Green startups should focus not only on increasing online visibility but also on educating customers, building trust, communicating genuine environmental benefits, and converting engagement into sustainable business performance. Nevertheless, the measurement model requires further validation, and the potential mediating role of Customer Awareness must be confirmed through bootstrapping. The recommendations should therefore be regarded as preliminary implications based on the current estimates rather than definitive causal conclusions. Green startups should develop integrated digital marketing strategies using social media, search engine optimisation, content marketing, email marketing, and targeted digital advertising. These activities should communicate the environmental benefits, quality, affordability, and practical value of their products. Marketing campaigns should be designed to reach clearly defined customer segments rather than relying solely on the frequency of online promotional activities

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