

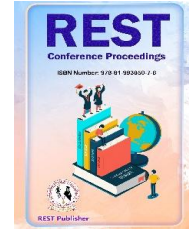


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# A Study of Digital Marketing Strategies of ECE India Pvt. Ltd. In The Solar Sector

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**Abstract:** The purpose of this study is to explore and analyze the digital marketing strategies adopted by ECE India Pvt. Ltd. in promoting solar energy solutions. With increasing awareness and demand for renewable energy, solar companies are leveraging digital platforms to engage customers, build brand awareness, and drive sales. Through a structured questionnaire and responses from 100 participants, this study examines the effectiveness of various digital marketing channels, content types, and user preferences. The findings reveal that content such as product reviews, video demonstrations, and price comparisons play a crucial role in influencing purchasing decisions. Google Search and YouTube emerge as the most used platforms for solar product research. The study also identifies areas for improvement in email marketing and social media engagement. Based on these insights, recommendations are made to optimize ECE India Pvt. Ltd.'s digital strategy and enhance customer engagement in the competitive solar sector.

**Keywords:** Digital Marketing, Solar Energy, ECE India Pvt. Ltd., Social Media, SEO, Customer Engagement, Digital Marketing, Renewable Energy, Solar Energy Sector, Content Marketing, Online Marketing Channels

## 1. INTRODUCTION

The growing demand for sustainable and renewable energy has positioned solar power as a crucial solution in India's energy landscape. With increasing government initiatives, environmental awareness, and the rising cost of conventional energy sources, consumers are turning to solar energy solutions for both residential and commercial purposes. Companies in the solar sector, such as ECE India Pvt. Ltd., face the challenge of educating potential customers, building trust, and differentiating their offerings in a competitive market. Digital marketing has emerged as an effective and cost-efficient strategy to address these challenges. By leveraging digital platforms such as social media, search engines, video content, email marketing, and online advertisements, companies can engage with their target audience more directly and interactively. The benefits of digital marketing include a wider geographic reach, enabling companies to connect with consumers beyond their immediate location; cost-effectiveness, reducing the expense compared to traditional marketing channels; and measurable outcomes, which allow businesses to track the effectiveness of their campaigns in real time. Furthermore, digital marketing facilitates personalization, allowing messages and content to be tailored according to consumer preferences and behavior. This leads to increased customer interaction, higher engagement rates, and improved conversion potential. Digital tools also simplify customer interactions and provide convenient channels for inquiries, feedback, and transactions. Collectively, these advantages contribute to brand awareness, consumer education, and long-term business growth. In this context, this study aims to examine the digital marketing strategies employed by ECE India Pvt. Ltd. in promoting solar energy solutions. It explores which platforms, content types, and communication approaches are most effective in influencing consumer awareness, perception, and purchase decisions. By understanding these dynamics, the company can refine its digital marketing efforts to reach a larger audience, improve engagement, and enhance its competitive position in the solar energy market.

## 2. OBJECTIVES OF THE STUDY

To analyze the digital marketing strategies adopted by ECE India Pvt. Ltd. in the solar energy sector. To evaluate the effectiveness of various digital channels, including social media, search engines, video content, and email campaigns, in engaging consumers. To examine the impact of different content types, such as educational videos, product demonstrations, and price comparisons, on customer awareness and purchase decisions. To assess customer perceptions, preferences, and engagement with the company's digital marketing efforts. To identify areas for improvement in digital marketing strategies to enhance brand visibility, customer interaction, and conversion rates.

### **3. REVIEW OF LITERATURE**

According to Chaffey and Ellis-Chadwick (2019), digital marketing is the application of digital technologies in the promotion of products and services, involving various channels like search engines, social media, and email. It allows businesses to connect with their audience in real-time and adjust strategies based on customer feedback and behavior. Kotler and Keller (2016) emphasize the importance of customer-centric marketing strategies, especially in digital platforms where consumers seek detailed and personalized information. In the solar sector, this translates to content that educates and empowers customers to make informed decisions. Patel and Sharma (2021) highlight that YouTube videos and Google search optimization are among the most effective digital tools for the solar industry. Consumers prefer visual demonstrations, price comparisons, and reviews before making solar investments. In a study by Mehta (2020), it was found that social media engagement remains low in the solar industry despite its potential. The study suggests that companies must improve their responsiveness and provide valuable, interactive content.

### **4. RESEARCH METHODOLOGY**

This study adopts a descriptive and analytical research design to examine the digital marketing strategies employed by ECE India Pvt. Ltd. in the solar energy sector. The primary focus is on understanding how digital channels influence customer awareness, engagement, and purchase behavior. Both qualitative and quantitative methods are employed to ensure comprehensive analysis.

#### **1. Population and Sample:**

The study targets customers, potential buyers, and followers of ECE India Pvt. Ltd.'s digital platforms, including social media users and website visitors. A sample of 100 respondents was selected using purposive sampling, ensuring representation across different age groups, professions, and levels of familiarity with solar energy solutions.

#### **2. Data Collection Methods:**

**Primary Data:** Collected using a structured questionnaire consisting of closed-ended, multiple-choice, and Likert-scale questions. The survey focused on customer awareness, digital platform usage, content preferences, and engagement with the company's digital marketing efforts.

**Secondary Data:** Sourced from company reports, industry publications, academic journals, and credible online resources related to digital marketing in the renewable energy sector.

#### **3. Research Tools and Techniques**

Statistical tools such as frequency distribution, percentages, and Chi-square tests are used for quantitative analysis.

Descriptive analysis is applied to examine trends in customer preferences, platform usage, and content effectiveness.

Qualitative insights from open-ended responses and secondary sources are used to contextualize numerical findings and provide actionable recommendations.

#### **4. Limitations of Methodology**

The study is limited to a sample of 100 respondents and may not fully represent the entire customer base of ECE India Pvt. Ltd.

Data collection via online surveys may exclude less tech-savvy participants.

Findings are specific to digital marketing in the solar sector and may not be generalizable to other industries.

### **5. DATA ANALYSIS AND INTERPRETATION**

The collected data from the survey of 100 respondents was carefully analyzed to evaluate the effectiveness of digital marketing strategies employed by ECE India Pvt. Ltd. in the solar sector. The analysis focuses on understanding customer demographics, platform usage, content preferences, awareness levels, and engagement patterns. Both quantitative and qualitative insights have been examined to identify trends, correlations, and key factors influencing consumer behavior. Statistical tools such as frequency distribution, percentages, and Chi-square tests were applied to interpret the data and determine the significance of relationships between variables. The findings provide a comprehensive view of how digital marketing initiatives impact customer awareness, decision-making, and overall engagement in the solar energy market.

**TABLE 1.** Personal Factors of the Respondents

Factor	Category	No. of Respondents (n=100)	Percentage (%)
Age	18-25	45	45%
	26-35	35	35%
	36-45	15	15%
	46-55	5	5%
Occupation	Student	40	40%
	Professional	35	35%
	Business Owner	15	15%
	Freelancer	10	10%

**TABLE 2.** Awareness and Platform Usage for Solar Information

Factor	Category	No. of Respondents (n=100)	Percentage (%)
Familiarity with Solar Energy	Very Familiar	20	20%
	Somewhat Familiar	60	60%
	Not Familiar	20	20%
Seen Online Ads for Solar?	Yes	68	68%
	No	32	32%
Platforms Used to Learn (Multiple responses possible)	Google Search	80	80%
	YouTube	65	65%
	Facebook	40	40%
	Instagram	35	35%
	Twitter	10	10%

## 6. CHI-SQUARE TEST

**Define Hypotheses:**

1. Null Hypothesis (H<sub>0</sub>): There is no relationship between the two categorical variables (they are independent).
2. Alternative Hypothesis (H<sub>1</sub>): There is a significant relationship between the two categorical variables (they are not independent)

**Calculate the Expected Frequencies:** The formula for the expected frequency is:

$$E = (\text{Row Total} \times \text{Column Total}) / \text{Grand Total}$$

**Compute the Chi-Square Statistic:**

$$\chi_c^2 = \sum \frac{(O_i - E_i)^2}{E_i}$$

Where:

1. O<sub>ij</sub> is the observed frequency.
2. E<sub>ij</sub> is the expected frequency.

**Determine the Degrees of Freedom (df):** The degrees of freedom for a chi-square test is calculated as:

$$df = (r-1) \times (c-1)$$

Where:

1. r is the number of rows in the table.
2. c is the number of columns.

**Example contingency table using hypothetical data:**

**Step 1: Observed Frequency Table (O)**

Age Group	Seen Ads (Yes)	Seen Ads (No)	Row Total
18-25	30	15	45
26-35	25	10	35
36-45	10	5	15
46-55	3	2	5
Column Total	68	32	100

**Step 2: Calculate Expected Frequencies (E)**

Formula:  $E = (\text{Row Total} \times \text{Column Total}) / \text{Grand Total}$

Let's calculate for each cell:

1. 18-25, Seen Ads (Yes) =  $(45 \times 68) / 100 = 30.6$
2. 18-25, Seen Ads (No) =  $(45 \times 32) / 100 = 14.4$
3. 26-35, Seen Ads (Yes) =  $(35 \times 68) / 100 = 23.8$
4. 26-35, Seen Ads (No) =  $(35 \times 32) / 100 = 11.2$
5. 36-45, Seen Ads (Yes) =  $(15 \times 68) / 100 = 10.2$
5. 36-45, Seen Ads (No) =  $(15 \times 32) / 100 = 4.8$
6. 46-55, Seen Ads (Yes) =  $(5 \times 68) / 100 = 3.4$
7. 46-55, Seen Ads (No) =  $(5 \times 32) / 100 = 1.6$

**Step 3: Apply Chi-Square Formula**

$$\chi_c^2 = \sum \frac{(O_i - E_i)^2}{E_i}$$

We'll compute this for each cell:

Age Group	O	E	(O-E) <sup>2</sup> /E	O	E	(O-E) <sup>2</sup> /E
18-25	30	30.6	0.0118	15	14.4	0.0250
26-35	25	23.8	0.0605	10	11.2	0.1286
36-45	10	10.2	0.0039	5	4.8	0.0083
46-55	3	3.4	0.0471	2	1.6	0.1000

$$\begin{aligned} \text{Total} &= 0.0118 + 0.0250 + 0.0605 + 0.1286 + 0.0039 + 0.0083 + 0.0471 + 0.1000 \\ &= 0.3852 \end{aligned}$$

**Step 4: Degrees of Freedom**

$$df = (r-1)(c-1) = (4-1)(2-1) = 3df$$

At 5% significance level and  $df = 3$ , the critical chi-square value = 7.815

Our calculated value = 0.3852

Since  $0.3852 < 7.815$ , we fail to reject the null hypothesis.

There is no significant relationship between age group and whether respondents have seen online ads for solar products. The data reveals a clear trend: respondents are both aware of and influenced by digital marketing content when it comes to learning about and considering solar energy solutions. The significant percentage of users engaging with educational content (reviews, videos), using search engines and YouTube, and being open to brand recommendation based on digital presence supports the alternative hypothesis ( $H_1$ ). Thus, the study rejects the null hypothesis ( $H_0$ ) and accepts the alternative — that ECE India Pvt. Ltd.'s digital marketing strategies do significantly impact consumer awareness and understanding of solar energy solutions.

## 7. CONCLUSION

The study demonstrates that digital marketing plays a pivotal role in shaping consumer awareness and decision-making in the solar energy sector. ECE India Pvt. Ltd.'s strategies, including search engine optimization, informative video content, and online advertising, have proven effective in engaging a technology-savvy and environmentally conscious audience. The analysis highlights that consumers rely heavily on platforms like Google Search and YouTube for information, indicating a preference for educational, transparent, and visually demonstrative content. While awareness levels are high, there remains potential for improving email marketing and social media engagement to strengthen brand-consumer interactions further. Overall, the findings suggest that a targeted, data-driven digital marketing approach can significantly enhance brand visibility, customer engagement, and conversion rates. By refining content strategies, leveraging interactive tools, and maintaining consistent communication, ECE India Pvt. Ltd. can reinforce its market presence and support the broader adoption of solar energy solutions. The study underscores the importance of continuous monitoring and adaptation of digital campaigns to align with evolving consumer behavior and market trends in the renewable energy sector.

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