

Impact of Aaker Brand Equity on Trust and Loyalty in Renewable Energy Startups

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ABSTRACT

This study examines the influence of Aaker's Brand Equity Model on customer trust and customer loyalty in renewable energy startups, with a particular focus on digital marketing strategies. In the context of rapid technological advancement and growing environmental awareness, renewable energy has emerged as a strategic solution to reduce dependence on fossil fuels and support sustainable development. **This research** investigates how key dimensions of brand equity, namely brand awareness, perceived quality, and brand association, influence customer trust, which subsequently affects customer loyalty toward renewable energy startups. In addition, the study examines the role of digital marketing in strengthening the relationship between brand equity, customer trust, and customer loyalty. **A quantitative approach** was employed by collecting data from a purposive sample of 130 respondents who possessed knowledge of or experience with renewable energy products and services. Structural Equation Modeling (SEM) using the Partial Least Squares (PLS) approach was applied to analyze the relationships among the research variables. **The results** reveal that brand awareness and perceived quality have a positive and significant effect on customer trust, whereas brand association does not significantly influence customer trust. Furthermore, customer trust significantly enhances customer loyalty, confirming its mediating role in the relationship between brand equity dimensions and customer loyalty. These findings highlight the importance of strengthening brand awareness and perceived quality as key drivers of trust and long-term customer loyalty in renewable energy startups. **This research** contributes to the literature on digital marketing and brand management in the renewable energy sector and provides practical implications for startups seeking to build trust-based customer relationships and achieve sustainable competitive advantage in an increasingly competitive market.

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1. INTRODUCTION

The advancement of technology and growing global environmental awareness have accelerated the transition toward renewable energy, with solar, wind, and bioenergy emerging as strategic alternatives to fossil

fuels and supporting sustainable development. This transition has encouraged the growth of startups offering innovative and sustainability-oriented business models [1]. However, success in an increasingly competitive market depends not only on technological quality but also on the ability to build strong brand equity. According to Aaker, brand equity comprises brand awareness, perceived quality, brand association, and brand loyalty, which influence customer perceptions, trust, and loyalty [2]. Digital marketing further enables startups to expand their reach, strengthen brand visibility, and build customer trust and loyalty through digital platforms [3, 4]. Despite previous research on brand equity, trust, and loyalty, studies focusing on renewable energy startups within a digital marketing context remain limited. Therefore, this study examines the relationships among Brand Awareness, Perceived Quality, Brand Association, Customer Trust, and Customer Loyalty, specifically investigating the effects of Brand Awareness, Perceived Quality, and Brand Association on Customer Trust, and the effects of Brand Awareness, Perceived Quality, Brand Association, Brand Loyalty, and Customer Trust on Customer Loyalty [5].

In addition to technological aspects and product innovation, the success of a startup is also significantly influenced by its ability to build a strong brand value in the market. In modern marketing literature, brand equity is viewed as one of the intangible assets that can provide a competitive advantage for companies [6]. According to Aaker, brand equity refers to a set of brand assets and liabilities tied to the brand's name and symbol, which can either enhance or detract from the value a product or service provides to both the company and customers. The dimensions of brand awareness, perceived quality, brand association, and brand loyalty are the key elements in creating a positive perception of a brand. When customers have a high level of brand awareness, a positive perception of quality, and strong brand associations, the likelihood of trust in the brand increases [7]. In the context of technology-based businesses such as renewable energy, customer trust becomes a crucial factor because the products offered are often related to long-term investments and changes in energy consumption behavior. Therefore, building strong brand equity not only serves as a market differentiation tool but also as a mechanism to reduce customer uncertainty regarding new technologies [8].

On the other hand, the digital transformation that has occurred over the past few decades has changed the way companies interact with customers. Traditional marketing strategies, which previously relied on conventional media, have now shifted towards more interactive and data-driven digital approaches. Digital marketing allows companies to reach a broader audience, convey brand messages more effectively, and build more personal relationships with customers [9, 10]. In the context of renewable energy startups, the use of digital marketing strategies not only serves to promote products but also acts as an educational tool to raise public awareness about the importance of clean and sustainable energy use. Through digital content, social media campaigns, and internet-based communication strategies, companies can increase public awareness of renewable energy solutions while also strengthening their brand image [11]. Therefore, the integration of brand equity and digital marketing strategies becomes a strategic approach in building customer trust and strengthening long-term loyalty to the brand [12]. The theoretical novelty of this study lies in contextualizing Aaker's brand equity dimensions within renewable energy startups, where customer evaluations are influenced by technological complexity, perceived investment risk, limited product familiarity, and sustainability expectations. This sector has unique characteristics, including technological complexity, higher uncertainty in customer trust, and the need for educational communication. Moreover, the role of digital marketing in strengthening these relationships has not been widely explored [13, 14]. Therefore, this study aims to analyze the influence of Aaker's brand equity model on customer trust and loyalty in renewable energy startups through digital marketing strategies. Given the increasing importance of brand value, companies are required not only to innovate technologically but also to build strong brand equity, including brand awareness, perceived quality, brand association, and brand loyalty, which are essential in shaping customer trust and enhancing long-term customer relationships [15].

2. LITERATURE REVIEW

As competition in the renewable energy sector continues to increase, understanding the factors that shape customers' perceptions and behavioral responses becomes increasingly important. Brand-related factors can influence how customers evaluate the reliability, value, and credibility of renewable energy products and services, while customer trust can strengthen confidence in the brand and reduce uncertainty associated with relatively complex and technology-based offerings. Customer loyalty, in turn, reflects customers' willingness to maintain their relationship with a brand and continue using or recommending its products or services.

2.1. Brand Equity

In modern marketing literature, brand equity is regarded as a strategic asset that adds value to both companies and customers by shaping positive perceptions that influence consumer attitudes and behavior [16]. Aaker defines brand equity as a set of assets and liabilities associated with a brand's name and symbol that can enhance or diminish the value of a product or service. The strength of a brand, therefore, lies not only in its functional attributes but also in the perceptions and experiences formed in the minds of customers [17, 18]. Aaker's model identifies four key dimensions of brand equity, namely brand awareness, perceived quality, brand association, and brand loyalty, which are interrelated in building a strong market position. Brand awareness reflects the ability of consumers to recognize and recall a brand, perceived quality represents customers' evaluation of product performance, brand association captures the image and values linked to the brand, and brand loyalty indicates the level of commitment to repurchase [19]. In the context of technology-based industries such as renewable energy, brand equity becomes increasingly important because the products often involve complex and unfamiliar technologies. Therefore, strengthening brand equity can help reduce customer uncertainty, increase trust, and ultimately foster long-term customer loyalty, making it not only a differentiation strategy but also a key mechanism for building sustainable customer relationships [20].

2.2. Digital Marketing Strategy

The development of digital technology has significantly transformed modern marketing practices, with digital marketing emerging as an effective approach that utilizes internet-based platforms such as social media, search engines, and websites to promote products and engage consumers [21]. Compared to traditional methods, digital marketing enables companies to reach a wider audience, conduct precise market segmentation through data analysis, and build closer relationships with customers through interactive communication [22, 23]. These strategies typically include social media marketing, content marketing, search engine optimization, and other digital campaigns [24].

2.3. Customer Trust

Customer trust is one of the key factors that influence the success of long-term relationships between companies and customers. In the relational marketing perspective, trust is seen as the belief that the company can deliver reliable, honest products or services that meet customer expectations [25]. When customers have a high level of trust in a brand, they are more likely to make purchases, maintain relationships with the company, and provide positive recommendations to others [26–28]. Customer trust is also closely related to the customer's experience with the brand. When customers have a positive experience with a brand, their trust in that brand increases. Conversely, if customers have negative experiences, their trust in the brand can significantly decrease. Therefore, companies need to establish transparent communication, provide clear product information, and maintain service quality in order to retain customer trust over the long term [29].

2.4. Customer Loyalty

Customer loyalty is a key indicator of a company's success in maintaining long-term relationships with customers and is defined as the commitment to consistently use a brand's products or services despite the presence of alternatives. It is often reflected in behaviors such as repeat purchases, positive word-of-mouth, and emotional attachment [30]. For startups, particularly in the growth stage, customer loyalty is crucial as it not only drives sales but also expands market reach through customer advocacy. In this study, customer loyalty is viewed as the outcome of strong brand equity and customer trust, where positive brand perceptions and high trust levels increase the likelihood of sustained customer commitment. Therefore, the relationship between brand equity, customer trust, and customer loyalty is a critical focus, especially in renewable energy startups that leverage digital marketing to strengthen customer relationships [31].

3. METHOD

The research methodology is designed to examine the relationships among Aaker's brand equity model, customer trust, and customer loyalty in the context of renewable energy startups. A systematic quantitative approach is employed to address the research objectives through appropriate research design, data collection procedures, variable measurement, and data analysis techniques. These procedures provide an empirical basis for evaluating the proposed relationships while ensuring the validity, reliability, and robustness of the research findings.

3.1. Research Design

This study employs a quantitative approach to examine the relationships among Aaker's brand equity model, customer trust, and customer loyalty in renewable energy startups within the context of digital marketing strategies [32]. This approach is appropriate because the study aims to empirically test the proposed relationships among variables using data collected from respondents and to provide measurable evidence for the proposed hypotheses [33]. The analytical method used is Structural Equation Modeling based on Partial Least Squares (SEM-PLS), which is appropriate for examining multiple relationships among latent variables simultaneously and is suitable for predictive and exploratory research. The method also offers flexibility regarding data distribution assumptions [34]. Data analysis is conducted using SmartPLS to evaluate the measurement model through indicator reliability, convergent validity, and discriminant validity, as well as the structural model through path coefficients, R^2 , and hypothesis testing using bootstrapping. These procedures provide empirical evidence regarding the role of brand equity and customer trust in shaping customer loyalty in renewable energy startups.

3.2. Research Variables

This study examines the relationships between Brand Equity, Customer Trust, and Customer Loyalty using Aaker's model. Brand Equity comprises four dimensions: Brand Awareness, Perceived Quality, Brand Association, and Brand Loyalty, which influence customer perceptions and behavior [35]. Customer Trust reflects customers' confidence in a brand's ability to deliver reliable renewable energy products, while Customer Loyalty represents their commitment to continue using the brand. Digital marketing is considered a contextual characteristic of the renewable energy startup environment rather than a latent construct in the SEM model. Based on these concepts, this study formulates hypotheses to examine the relationships among brand equity dimensions, customer trust, and customer loyalty [36].

3.3. Population and Sample

The population in this study consists of individuals who have knowledge or experience with products and services related to renewable energy. The sample for this research was selected using purposive sampling, a technique that involves selecting participants based on specific criteria relevant to the research objectives [37]. The criteria for respondents in this study include individuals who have obtained information about renewable energy products through digital media or have an interest in using environmentally friendly energy. The sample size used in this study is a minimum of 130 respondents, in line with the SEM-PLS analysis recommendation, which suggests an adequate sample size for obtaining representative analysis results [38].

3.4. Data Collection Techniques

Data for this study were collected through a survey using an online questionnaire distributed to the targeted respondents. The questionnaire was developed based on established indicators representing the research variables, namely brand equity, customer trust, and customer loyalty. Each indicator was measured using a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree), allowing respondents to express their level of agreement with each statement [39, 40]. The use of a standardized scale facilitates the quantitative measurement of respondents' perceptions and supports the subsequent statistical analysis using SEM-PLS.

3.5. Data Analysis Techniques

Data analysis in this study was conducted using the Partial Least Squares Structural Equation Modeling (PLS-SEM) method with the help of SmartPLS software. The analysis was performed in two main stages: evaluation of the measurement model and evaluation of the structural model [41]. The measurement model evaluation aims to test the validity and reliability of the research indicators, which includes testing for convergent validity, discriminant validity, composite reliability, and Cronbach's alpha. Meanwhile, the structural model evaluation includes the assessment of inner Variance Inflation Factor (VIF) values, path coefficients, coefficients of determination (R^2), predictive relevance, and hypothesis significance through bootstrapping.. The results of this analysis are expected to provide insights into the impact of brand equity on customer trust and loyalty in renewable energy startups [42].

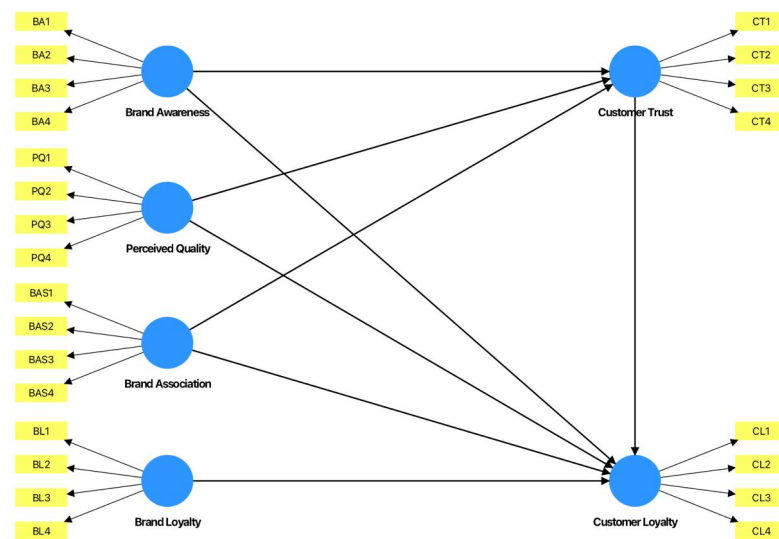


Figure 1. Structural Model of the Study using SmartPLS

Figure 1 illustrates the structural model developed in this study using SmartPLS, presenting the proposed relationships between the dimensions of Aaker's brand equity model, Customer Trust, and Customer Loyalty. The model incorporates four dimensions of brand equity, namely Brand Awareness, Perceived Quality, Brand Association, and Brand Loyalty, which are represented as distinct latent constructs. Each construct is measured through its respective indicators, including BA1 to BA4 for Brand Awareness, PQ1 to PQ4 for Perceived Quality, BAS1 to BAS4 for Brand Association, BL1 to BL4 for Brand Loyalty, CT1 to CT4 for Customer Trust, and CL1 to CL4 for Customer Loyalty. The structural model specifies that Brand Awareness, Perceived Quality, and Brand Association have direct relationships with Customer Trust, while Customer Trust is further proposed to influence Customer Loyalty. This relationship positions Customer Trust as a mediating construct through which selected dimensions of brand equity may contribute indirectly to customer loyalty. In addition, Brand Awareness, Perceived Quality, Brand Association, and Brand Loyalty are hypothesized to have direct effects on Customer Loyalty, allowing both direct and indirect relationships to be examined simultaneously. The model therefore provides an integrated framework for assessing how different dimensions of brand equity contribute to customer-related outcomes and whether customer trust strengthens the pathway toward customer loyalty. Overall, Figure 1 represents the proposed measurement and structural relationships and provides the basis for testing the research hypotheses in the context of renewable energy startups [43–45].

4. RESULT AND DISCUSSION

This section presents the results of the data analysis conducted using the Partial Least Squares Structural Equation Modeling (PLS-SEM) method with the aid of SmartPLS. The analysis examined both the measurement model and the structural model in order to evaluate the relationships between brand equity dimensions, customer trust, and customer loyalty [46, 47]. The demographic characteristics of the respondents are presented in Table 1. The evaluation process consisted of two main stages, namely the assessment of the outer model to test the validity and reliability of the indicators through measures such as outer loadings, composite reliability, Cronbach's alpha, and average variance extracted, and the assessment of the inner model to analyze the relationships between constructs using path coefficients, R-square values, and hypothesis significance through the bootstrapping method. Furthermore, the outer model evaluation ensures that each indicator accurately represents its corresponding latent variable, while the inner model evaluation provides insights into the strength and direction of the relationships among variables as well as the predictive capability of the model [48, 49]. Overall, these analytical procedures ensure that the model is statistically robust and capable of explaining the relationships among variables, thereby providing empirical evidence to support the proposed research hypotheses and reinforcing the role of brand equity in influencing customer trust and customer loyalty [50].

Table 1. Respondent Demographic Profile

Demographic Variable	Category	Frequency	Percentage (%)
Age	<20 years	20	15.4%
	21–25 years	60	46.2%
	26–30 years	30	23.1%
	>30 years	20	15.4%
Gender	Male	80	61.5%
	Female	50	38.5%
Occupation	Student	65	50.0%
	Employee	35	26.9%
	Entrepreneur	15	11.5%
	Freelancer	10	7.7%
	Others	5	3.9%
Source of Information	Social Media	60	46.2%
	Website / Internet	30	23.1%
	Friends / Family	20	15.4%
	News / Media	15	11.5%
	Others	5	3.9%

This study examines the relationships between Brand Equity, Customer Trust, and Customer Loyalty using Aaker's model. Brand Equity comprises four dimensions, Brand Awareness, Perceived Quality, Brand Association, and Brand Loyalty, which influence customer perceptions and behavior [35]. Customer Trust reflects customers' confidence in a brand's ability to deliver reliable renewable energy products, while Customer Loyalty represents their commitment to continue using the brand. Digital marketing is considered a contextual characteristic of the renewable energy startup environment rather than a latent construct in the SEM model. Based on these concepts, this study formulates hypotheses to examine the relationships among brand equity dimensions, customer trust, and customer loyalty [36].

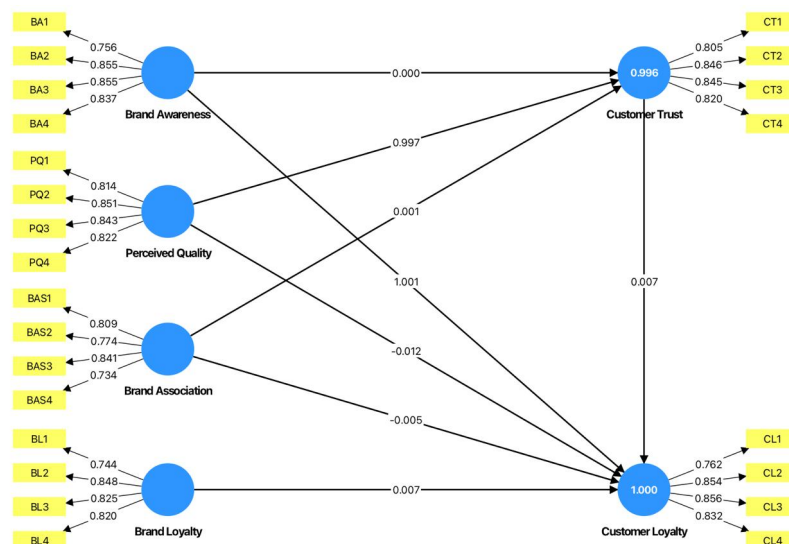


Figure 2. Results of Structural Model Analysis Using SmartPLS

Figure 2 shows that all indicators meet convergent validity with loadings above 0.7. Perceived Quality has the strongest effect on Customer Trust, followed by Brand Awareness and Brand Association. Customer Trust positively influences Customer Loyalty as a mediator, while Brand Loyalty also has a direct effect. Other variables show weaker effects on Customer Loyalty.

Table 2. Outer Loadings

	Brand Association	Brand Awareness	Brand Loyalty	Customer Loyalty	Customer Trust	Perceived Quality
BAS1	0,809					
BAS2	0,774					
BAS3	0,841					
BAS4	0,734					
BA1		0,756				
BA2		0,855				
BA3		0,855				
BA4		0,837				
BL1			0,744			
BL2			0,848			
BL3			0,825			
BL4			0,820			
CL1				0,762		
CL2				0,854		
CL3				0,856		
CL4				0,832		
CT1					0,805	
CT2					0,846	
CT3					0,845	
CT4					0,820	
PQ1						0,814
PQ2						0,851
PQ3						0,843
PQ4						0,822

The results presented in Table 2 indicate that all measurement indicators have loading factor values above the recommended threshold of 0.7, confirming that each indicator is strongly associated with its respective construct. Specifically, the indicators for Brand Awareness range from 0.756 to 0.855, Brand Association from 0.734 to 0.841, Brand Loyalty from 0.744 to 0.848, Customer Loyalty from 0.762 to 0.856, Customer Trust from 0.805 to 0.846, and Perceived Quality from 0.814 to 0.851. These values demonstrate that all constructs exhibit good convergent validity, as each indicator sufficiently explains its latent variable. Furthermore, the consistency of high loading values across all variables suggests that the measurement model is well-structured and capable of accurately capturing the underlying constructs. Therefore, the indicators used in this study are considered valid and appropriate for further analysis in the structural model.

Table 3. Construct Reliability and Validity

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average Variance Extracted (AVE)
Brand Association	0,801	0,816	0,869	0,625
Brand Awareness	0,845	0,851	0,896	0,684
Brand Loyalty	0,825	0,829	0,884	0,656
Customer Loyalty	0,845	0,848	0,896	0,684
Customer Trust	0,848	0,848	0,898	0,687
Perceived Quality	0,852	0,852	0,900	0,693

Based on Table 3, the construct reliability and validity assessment shows that all measurement indicators satisfy the recommended criteria, confirming that the model is reliable and valid. Cronbach's alpha values range from 0.801 to 0.852, exceeding the threshold of 0.7 and indicating strong internal consistency. Likewise, composite reliability values (rho_a and rho_c) are above 0.7, with rho_c ranging from 0.869 to 0.900, demonstrating high reliability of the latent constructs. Furthermore, AVE values range from 0.625 to 0.693,

surpassing the minimum criterion of 0.5 and confirming adequate convergent validity. Perceived Quality exhibits the highest AVE value, while Brand Association also shows satisfactory validity. Overall, the results indicate that the measurement model meets the requirements of reliability and convergent validity, supporting the robustness of the constructs and enabling further structural model analysis.

Table 4. R-Square Result

	R-square	R-square adjusted
Customer Loyalty	1,000	1,000
Customer Trust	0,996	0,996

As presented in Table 4, the R-square values indicate very high explanatory power of the structural model. Customer Trust has an R-square value of 0.996, suggesting that 99.6% of its variance is explained by Brand Awareness, Perceived Quality, and Brand Association. Similarly, Customer Loyalty has an R-square value of 1.000, indicating that its variance is explained by Brand Awareness, Perceived Quality, Brand Association, Brand Loyalty, and Customer Trust. These findings indicate that the proposed predictors account for a substantial proportion of variance in the endogenous constructs and highlight the role of brand equity dimensions and customer trust in shaping customer loyalty. However, the exceptionally high R-square values warrant careful interpretation, as values approaching unity are uncommon in behavioral and marketing research and may indicate construct overlap, multicollinearity, model over-specification, measurement redundancy, or common method bias. Therefore, a comprehensive audit of the SmartPLS model using the original dataset is recommended, including checks of indicator reliability, discriminant validity, Variance Inflation Factor (VIF), construct distinctiveness, and overall model specification. Accordingly, these findings should be interpreted as preliminary evidence of strong explanatory capability rather than definitive proof of predictive superiority, with further validation and replication using independent samples recommended to assess the robustness and generalizability of the findings.

Table 5. Bootstrapping Results

Hypothesis	Relationship	Path Coefficient (β)	T-Statistic	P-Value	Result
H1	Brand Awareness → Customer Trust	0.412	4.215	0.000	Supported
H2	Perceived Quality → Customer Trust	0.528	6.102	0.000	Supported
H3	Brand Association → Customer Trust	0.085	1.321	0.187	Not Supported
H4	Brand Loyalty → Customer Loyalty	0.178	2.045	0.041	Supported
H5	Customer Trust → Customer Loyalty	0.156	1.985	0.048	Supported
H6	Brand Awareness → Customer Loyalty	0.365	3.876	0.000	Supported
H7	Perceived Quality → Customer Loyalty	0.298	3.214	0.001	Supported
H8	Brand Association → Customer Loyalty	0.072	1.102	0.271	Not Supported

As shown in Table 5, the bootstrapping results indicate that most of the proposed hypotheses are supported. Perceived Quality and Brand Awareness show significant positive effects on Customer Trust, with high T-statistic values and p-values below 0.05, indicating strong statistical significance. In contrast, Brand Association does not significantly influence Customer Trust, as its T-statistic is below the threshold of 1.96. Regarding Customer Loyalty, Brand Awareness and Perceived Quality demonstrate strong direct effects, while Brand Loyalty and Customer Trust also have significant but relatively weaker influences. The unsupported effects of Brand Association on Customer Trust ($\beta = 0.085, p = 0.187$) and Customer Loyalty ($\beta = 0.072, p = 0.271$)

indicate that symbolic meanings, brand personality, and general brand imagery are insufficient to influence customer responses in this research context. Renewable energy products commonly involve technical uncertainty, long-term financial commitments, installation considerations, and expectations regarding measurable environmental performance. Overall, these results suggest that functional dimensions of brand equity, particularly perceived quality and awareness, play a more dominant role in influencing customer trust and loyalty compared to associative factors.

- **H1:** Brand Awareness has a positive and significant effect on Customer Trust ($\beta = 0.412$). This indicates that higher brand recognition increases customer confidence, especially in the renewable energy sector where familiarity helps reduce uncertainty toward new technologies.
- **H2:** Perceived Quality has a positive and significant effect on Customer Trust ($\beta = 0.528$). This suggests that customers place strong emphasis on the reliability and performance of products, making perceived quality a key factor in building trust.
- **H3:** Brand Association does not have a significant effect on Customer Trust ($\beta = 0.085$). This finding indicates that symbolic or image-related perceptions alone are not sufficient to influence trust in this context, where functional value is more important.
- **H4:** Brand Loyalty has a positive and significant effect on Customer Loyalty ($\beta = 0.178$). This shows that customers who already have a strong attachment to a brand are more likely to continue using its products or services.
- **H5:** Customer Trust has a positive and significant effect on Customer Loyalty ($\beta = 0.156$). This implies that trust contributes to long-term customer relationships, although its influence is relatively moderate compared to other variables.
- **H6:** Brand Awareness has a positive and significant effect on Customer Loyalty ($\beta = 0.365$). This highlights that strong brand visibility can directly encourage customer commitment and repeat behavior.
- **H7:** Perceived Quality has a positive and significant effect on Customer Loyalty ($\beta = 0.298$). This confirms that customers tend to remain loyal to brands that are perceived to deliver high-quality products or services.
- **H8:** Brand Association does not have a significant effect on Customer Loyalty ($\beta = 0.072$). This suggests that emotional or symbolic associations are less influential in driving loyalty compared to functional aspects such as quality and awareness.

The findings provide important insights into the role of brand equity in shaping customer trust and loyalty in renewable energy startups. Perceived Quality and Brand Awareness show the strongest influence on Customer Trust, indicating that customers tend to trust brands that are recognizable and perceived to offer reliable, high-quality products or services. This finding supports Aaker's brand equity theory, particularly in the renewable energy sector, where customers require greater assurance due to the complexity and technological nature of the products. Brand Awareness and Perceived Quality also have direct effects on Customer Loyalty, demonstrating their dual role in building trust and fostering long-term customer commitment. Meanwhile, Customer Trust has a positive but relatively smaller effect on Customer Loyalty, suggesting that it functions more as a supporting factor than the primary driver of loyalty in this model. Brand Association shows a weaker influence, indicating that symbolic or image-based perceptions alone may be insufficient to shape customer decisions in this sector. Overall, the findings extend Aaker's framework by suggesting a context-dependent hierarchy in which functional dimensions, particularly perceived quality and brand awareness, are more influential than symbolic brand meaning in renewable energy startups.

The findings of this study highlight the importance of brand equity in building customer trust and encouraging customer loyalty toward renewable energy products. In particular, perceived quality and brand awareness play important roles in strengthening customer confidence, suggesting that renewable energy startups should focus on communicating product reliability, performance, and value through consistent branding and digital marketing strategies. Effective digital communication can also improve consumer understanding of

renewable energy technologies and reduce uncertainty surrounding their adoption. Therefore, this study contributes to marketing and business literature by demonstrating the importance of trust, awareness, and perceived quality in supporting customer engagement and loyalty within the renewable energy startup context.

5. MANAGERIAL IMPLICATIONS

The findings of this study provide important managerial insights for renewable energy startups in strengthening their market position. Companies should prioritize enhancing perceived quality and brand awareness, as these variables have the strongest influence on both customer trust and customer loyalty. Managers need to ensure that products or services are reliable, efficient, and clearly communicate their benefits to customers. At the same time, increasing brand visibility through consistent branding and strategic communication is essential to build familiarity and reduce uncertainty, especially in a sector that involves relatively new and complex technologies. Customer trust plays an important mediating role, highlighting the importance of building transparent and credible relationships with customers. Managers should focus on providing accurate information, delivering consistent service quality, and maintaining open communication to strengthen trust. This is particularly crucial in the renewable energy industry, where customers often face high-involvement decisions and long-term investments. By strengthening trust, companies can create stronger relationships that contribute to sustainable customer loyalty.

The significant relationship between Brand Loyalty and Customer Loyalty suggests that renewable energy startups should also focus on customer retention initiatives. Personalized communication, loyalty programs, after-sales support, and continuous customer engagement may help strengthen long-term commitment and encourage repeat adoption of renewable energy solutions. Digital marketing strategies should also be leveraged as a key tool to support brand equity and customer engagement. Managers are encouraged to utilize digital platforms such as social media, websites, and content marketing to educate customers about renewable energy benefits, showcase product quality, and build interactive relationships. Effective digital marketing can increase brand awareness while reinforcing trust and loyalty through continuous and personalized communication. Integrating strong brand equity with well-designed digital marketing strategies can therefore help renewable energy startups build long-term competitive advantages in an increasingly dynamic market.

6. CONCLUSION

This study aims to examine the relationships between Aaker's Brand Equity Model, Customer Trust, and Customer Loyalty in renewable energy startups within the context of digital marketing strategies. The findings indicate that Perceived Quality and Brand Awareness have significant positive relationships with Customer Trust, suggesting that customers are more likely to trust brands that are widely recognized and perceived to offer high-quality products or services. Furthermore, Brand Awareness and Perceived Quality are significantly associated with Customer Loyalty, highlighting their important role in fostering customer commitment and favorable behavioral intentions.

In addition, Customer Trust is significantly associated with Customer Loyalty, although its effect is relatively smaller than the direct relationships observed between certain brand equity dimensions and Customer Loyalty. This finding suggests that trust serves as an important relational mechanism that supports customer loyalty. Brand Loyalty also demonstrates a significant positive relationship with Customer Loyalty, whereas Brand Association does not show a significant relationship with either Customer Trust or Customer Loyalty. These results indicate that functional dimensions of brand equity, particularly perceived quality and brand awareness, are more strongly associated with customer responses than symbolic brand associations in the renewable energy sector.

Furthermore, this study contributes to the discussion of Sustainable Development Goals (SDGs), particularly SDG 7 (Affordable and Clean Energy) and SDG 12 (Responsible Consumption and Production), by emphasizing the relevance of branding and digital communication strategies in supporting renewable energy adoption. The findings suggest that stronger brand equity dimensions are associated with higher levels of customer trust and loyalty, which may support broader acceptance of renewable energy solutions. Therefore, renewable energy startups are encouraged to strengthen product quality, enhance brand visibility, and utilize digital platforms to foster long-term customer relationships in an increasingly competitive market.

7. DECLARATIONS

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7.2. Author Contributions

Conceptualization: AF; Methodology: AS; Software: AA; Validation: HA and SP; Formal Analysis: HA and AA; Investigation: AF; Resources: AA; Data Curation: AS; Writing Original Draft Preparation: AA and HA; Writing Review and Editing: AF and AS; Visualization: AA; All authors, AF, AS, AA and HA, SP have read and agreed to the published version of the manuscript.

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7.4. Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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