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Achieving Sustainable Customer Loyalty in the Petrochemical Industry: The Effect of Service Innovation, Product Quality, and Corporate Image with Customer Satisfaction as a Mediator

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Abstract: Amidst the intense competition in the petrochemical industry, the determinants of sustainable customer loyalty remain underexplored. This study investigates the factors influencing corporate sustainable customer loyalty, focusing on service innovation, product quality, and corporate image, with customer satisfaction as a mediating variable. In the context of intense competition, understanding these factors is crucial for sustaining customer relationships and ensuring long-term success. The primary aim is to explore how these elements interact to shape sustainable customer loyalty. Using a cross-sectional survey method, data were collected from 120 corporate clients through structured questionnaires. The study employed Partial Least Squares Structural Equation Modeling (PLS-SEM) to analyze the relationships between the variables. The findings reveal that product quality significantly impacts both customer satisfaction and loyalty, highlighting its pivotal role in meeting customer expectations and fostering long-term relationships. While service innovation does not directly affect immediate satisfaction, it significantly enhances sustainable customer loyalty, indicating its importance for long-term engagement. Corporate image also plays a crucial role in strengthening sustainable customer loyalty, underscoring the value of maintaining a positive reputation. The study concludes that customer satisfaction mediates the relationship between product quality and loyalty, emphasizing the cyclical nature of these constructs. This research fills a notable gap in the literature by providing a comprehensive model that integrates these variables within the petrochemical industry context, offering new insights into effective sustainable customer loyalty strategies.

Keywords: corporate image; customer satisfaction; product quality; petrochemical industry; service innovation; sustainability; sustainable customer loyalty

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Citation: Kosasih, O.; Hidayat, K.; Hutahayan, B.; Sunarti. Achieving Sustainable Customer Loyalty in the Petrochemical Industry: The Effect of Service Innovation, Product Quality, and Corporate Image with Customer Satisfaction as a Mediator. *Sustainability* **2024**, *16*, 7111. https://doi.org/10.3390/su16167111

Academic Editor: Lester Johnson

Received: 25 June 2024
Revised: 12 August 2024
Accepted: 13 August 2024
Published: 19 August 2024

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1. Introduction

In the dynamic and highly competitive business world, including the oil and gas industry sector, company performance serves as the main barometer of an organization's success regarding sustainability [1,2]. This aspect is not only measured by financial profit but also by other factors such as sustainable customer loyalty, customer satisfaction, product quality, innovation, corporate image, and operational sustainability [3]. This study will delve into the customer behavior of Pertamina Patra Niaga, a state-owned enterprise in the oil and gas sector, and the factors that influence it to ensure sustainable corporate success. Pertamina Patra Niaga operates in the marketing of oil and gas products, including petrochemical products. The petrochemical product market is an oligopoly, where competition in the Indonesian market is limited to a few producer and importer companies [4,5]. In this context, Pertamina Patra Niaga is one of the key players in the marketing of petrochemical products in Indonesia.

Sustainable customer loyalty is an essential foundation for companies amidst increasing business competition [6–8]. Sustainable customer loyalty not only creates long-term

relationships between the company and customers but also plays a crucial role in determining the sustainability and growth of the company [9,10]. Loyal customers not only become a stable source of revenue but also have the potential to become effective brand advocates [11,12]. Customers often recommend products or services to their friends, family, and colleagues, which can expand the customer base through word-of-mouth [13,14]. Additionally, loyal customers tend to be more receptive to innovations and changes made by the company because they have built strong trust in the brand [15–17]. Therefore, efforts to increase sustainable customer loyalty should be a top priority in marketing strategies, through approaches that focus on product quality, excellent service, and satisfying customer experiences [18,19].

Research shows that companies that succeed in maintaining sustainable customer loyalty are more capable of surviving in the long term and are more resilient to market fluctuations [20,21]. The success of a company is not only measured in terms of sales or financial profit but also by its ability to maintain and expand market share through customer satisfaction and loyalty [22,23]. Sustainable customer loyalty creates a solid foundation for long-term growth, creating an environment where companies can adapt to market changes [24,25], implement service innovations [26], and consistently meet customer expectations [27]. By understanding the important role of sustainable customer loyalty, management can design strategies that focus on building deep and meaningful relationships with customers to achieve long-term success.

Despite extensive research on sustainable customer loyalty in various industries, there is a notable gap in the petrochemical sector, particularly concerning the integrated effects of service innovation, product quality, and corporate image on corporate sustainable customer loyalty. While previous studies have primarily focused on individual factors, there is limited understanding of how these elements interact and collectively influence sustainable customer loyalty within the context of a state-owned enterprise in the oil and gas sector. Additionally, the mediating role of customer satisfaction in this relationship has not been thoroughly examined, leaving a crucial gap in the literature.

The novelty of this research is based on several key considerations that form the foundation of its innovative contributions.

(1) The research model selected comprehensively addresses five critical variables: sustainable customer loyalty, customer satisfaction, product quality, service innovation, and corporate image. This holistic approach is essential in closing existing research gaps, as it allows for a detailed and thorough analysis of each variable, providing a deeper understanding of their relationships and interactions. Consequently, this enables the research to make a more significant contribution to the existing literature.
(2) Second, the study involves re-examining related inconsistencies by conducting repeat studies. This approach allows the research to evaluate and confirm previous results, identify factors that may cause inconsistencies, and provide the necessary clarification. By doing so, the study strengthens the validity and reliability of its findings, contributing to the advancement of research methodologies in this field.
(3) Lastly, the decision to explore the research within the business-to-business (B2B) context adds significant value, as this area remains relatively underexplored. The B2B sector has unique dynamics and characteristics that can differ significantly from consumer-based research. Thus, this study offers new insights and a deep understanding of the factors influencing business relationships in the B2B environment, filling a previously underexplored knowledge gap. By addressing these aspects, the research advances both theoretical understanding and practical applications in the field, ensuring long-term sustainability and competitiveness for companies.

2. Literature Review and Research Hypotheses

2.1. Service Innovation, Product Quality, and Corporate Image as Determinants of Customer Satisfaction

Innovation in service has a positive and significant impact on customer satisfaction. The implementation of innovation, such as cutting-edge technology, new business models, and personalized services, creates unique and efficient experiences, meeting the evolving needs of customers [28]. In the context of the petrochemical industry, service innovation is particularly critical due to the complex and technical nature of the products and services offered [28]. Innovative technological solutions streamline processes, reduce waiting times, and provide faster access, thus enhancing customer perceptions of service quality and service innovation [29]. Additionally, differentiation in competitive markets can enhance the company's competitive advantage [30]. A deep understanding of customer preferences also enables more personalized and relevant service strategies, strengthening customer relationships and building loyalty [31].

Parallel to service innovation, product quality also plays a crucial role in customer satisfaction. In the petrochemical industry, high-quality products are essential due to their impact on safety, reliability, and efficiency in various applications [32]. High-quality products, including reliability, durability, features, and designs that satisfy or exceed customer expectations [33], create positive experiences [34], enhancing trust and sustainable satisfaction [35]. High quality reinforces long-term customer relationships and loyalty, while dissatisfaction with product quality can damage the company's image and decrease customer trust [36].

Corporate image also plays a crucial role in shaping customer satisfaction. In the petrochemical industry, a positive corporate image is vital due to the industry's environmental and social implications [37]. A positive image reflects a good reputation and fosters trust and loyalty [38]. Aspects such as business ethics, social responsibility, and company values differentiate the company from others, providing a sense of security and enhancing perceptions of quality, reliability, and integrity [22,39]. A strong corporate image not only raises customer expectations but also strengthens long-term relationships and makes customers less vulnerable to competition [40].

Overall, service innovation, product quality, and corporate image are interconnected and collectively determine the level of customer satisfaction in the petrochemical industry. A company's commitment to these three aspects strategically leads to high customer satisfaction, strengthens loyalty, and supports sustainable business growth. Based on the information provided earlier, the research proposes the following hypotheses:

H1: *service innovation affects customer satisfaction*

H2: *product quality affects customer satisfaction*

H3: *corporate image affects customer satisfaction*

2.2. Service Innovation, Product Quality, and Corporate Image as Determinants of Sustainable Customer Loyalty

Innovation in service, product quality, and corporate image play inseparable roles in shaping and maintaining sustainable customer loyalty. These three elements are interconnected and collectively determine how loyal customers are to a brand or company [41,42]. In the context of the petrochemical industry, service innovation creates unique and satisfying experiences for customers, encouraging them to remain loyal to a brand or company [3,43]. Service innovation also sets a brand apart from its competitors, creating a positive impact in the minds of customers [44,45]. With advancements in technology, service innovation continues to evolve by utilizing digital solutions and applications that facilitate interactions between companies and customers [46,47], which is particularly important in the highly technical and competitive petrochemical sector [48].

Product quality plays a central role in shaping sustainable customer loyalty, as superior products build trust and satisfaction among customers [49]. In the petrochemical industry, high product quality is crucial due to the critical applications of petrochemical products in various industries [50]. By providing products that exceed expectations, companies can create emotional bonds with customers, leading to strong and sustainable relationships in the long run [51,52].

The influence of corporate image on sustainable customer loyalty is significant, creating trust, loyalty, and emotional affiliation with the brand [53,54]. In the petrochemical industry, a strong and consistent corporate image reassures customers that they will continue to receive positive experiences and added value from the brand [55]. Given the environmental and social scrutiny faced by the petrochemical sector, demonstrating commitment to brand values, delivering consistent customer experiences, and communicating transparently are crucial for maintaining a positive corporate image [56]. Companies can strengthen their image as trusted and reliable partners for their customers by showcasing ethical practices and social responsibility.

Overall, service innovation, product quality, and corporate image are interconnected and collectively determine the level of customer satisfaction and loyalty in the petrochemical industry. A company's commitment to these three aspects strategically leads to high customer satisfaction, strengthens loyalty, and supports sustainable business growth. Based on the information provided earlier, the research proposes the following hypotheses:

H4: *service innovation affects sustainable customer loyalty*

H5: *product quality affects sustainable customer loyalty*

H6: *corporate image affects sustainable customer loyalty*

2.3. Customer Satisfaction as a Determinant of Sustainable Customer Loyalty

Customer satisfaction has a significant impact on sustainable customer loyalty, as it can establish a strong foundation for a long-term relationship between customers and the company [57]. In the context of the petrochemical industry, when customers feel satisfied with the products or services they receive, they are more likely to remain loyal and make repeat purchases [58,59]. Customer satisfaction creates emotional bonds and positive perceptions of the brand [60], forming a solid basis for loyalty [42]. The importance of customer satisfaction in enhancing loyalty lies in the company's ability to meet or even exceed customer expectations, which is crucial in the highly competitive and technically demanding petrochemical sector [61]. These positive experiences foster a sense of trust, which is a key element in nurturing long-term relationships [62].

In the petrochemical industry, satisfied customers tend to be more tolerant of imperfections or issues that may arise, as they believe that the company will address these complaints effectively [3]. This tolerance is particularly important given the complex nature of petrochemical products and services [63]. Satisfied customers are inclined to provide positive testimonials, offer good feedback, and recommend the company's products or services to others [42,64]. Recommendations from satisfied customers can be the most effective marketing tool, helping the company attract new customers and expand its customer base in the petrochemical industry.

Overall, customer satisfaction in the petrochemical industry is pivotal for fostering loyalty and sustaining long-term customer relationships. Based on the information provided earlier, the research proposes the following hypotheses:

H7: *customer satisfaction affects sustainable customer loyalty*

2.4. Customer Satisfaction as a Mediator of the Effects of Service Innovation, Product Quality, and Corporate Image on Sustainable Customer Loyalty

Customer satisfaction is a crucial intermediary variable that bridges the gap between various service attributes and sustainable customer loyalty. In the petrochemical sector, where sustainability and long-term customer relationships are paramount, understanding the mediating role of customer satisfaction can significantly enhance business practices and outcomes. Service innovation involves the implementation of new or significantly improved services, processes, or delivery methods. According to Ref. [65], service innovation significantly enhances customer satisfaction. This finding is supported by Ref. [66], who demonstrated that service innovation positively impacts service delivery quality, thereby improving customer satisfaction. These studies highlight that innovative service processes can effectively meet customer needs, leading to higher satisfaction levels. In the petrochemical sector, sustainable customer loyalty is essential due to the industry's technical complexities and long-term customer relationships. The findings from Refs. [65,66] indicate that service innovation can enhance sustainable customer loyalty by improving customer satisfaction.

Product quality is also a crucial determinant of customer satisfaction and loyalty, especially in the petrochemical sector, which adheres to high technical and safety standards. Maintaining high product quality is essential for ensuring customer satisfaction and loyalty, as substandard products can have severe safety and environmental implications. Ref. [67] found that service quality positively influences customer satisfaction and loyalty in Indonesia. Similarly, Ref. [68] found that information quality and personalization on e-government websites significantly affect citizen e-loyalty, with e-satisfaction and e-trust acting as mediators. Ref. [69] also demonstrated that product quality and store quality significantly impact customer satisfaction and loyalty. For petrochemical companies, consistently delivering high-quality products can lead to sustained customer satisfaction and loyalty.

Furthermore, corporate image plays a significant role in determining customer satisfaction and loyalty, especially in industries where trust and reputation are crucial. Ref. [70] explored the impact of customer relationship management (CRM) and corporate reputation on customer loyalty, with customer satisfaction as a mediator in SMEs in Pakistan. Similarly, Ref. [53] found that corporate image indirectly affects customer loyalty, with customer satisfaction mediating this relationship. Ref. [71] also emphasized the importance of customer satisfaction in retaining customers and enhancing loyalty, influenced by service quality and corporate image. In the petrochemical sector, maintaining a strong corporate image through effective CRM and responsible practices can significantly enhance customer satisfaction and loyalty, and social responsibility can significantly boost customer satisfaction and loyalty.

Based on these insights, the research proposes the following hypotheses:

H8: *Customer satisfaction mediates the effect of service innovation on sustainable customer loyalty.*

H9: *Customer satisfaction mediates the effect of product quality on sustainable customer loyalty.*

H10: *Customer satisfaction mediates the effect of corporate image on sustainable customer loyalty.*

The description of the relationships among the variables above, which are then visualized into a research model, can be seen in Figure 1 below.

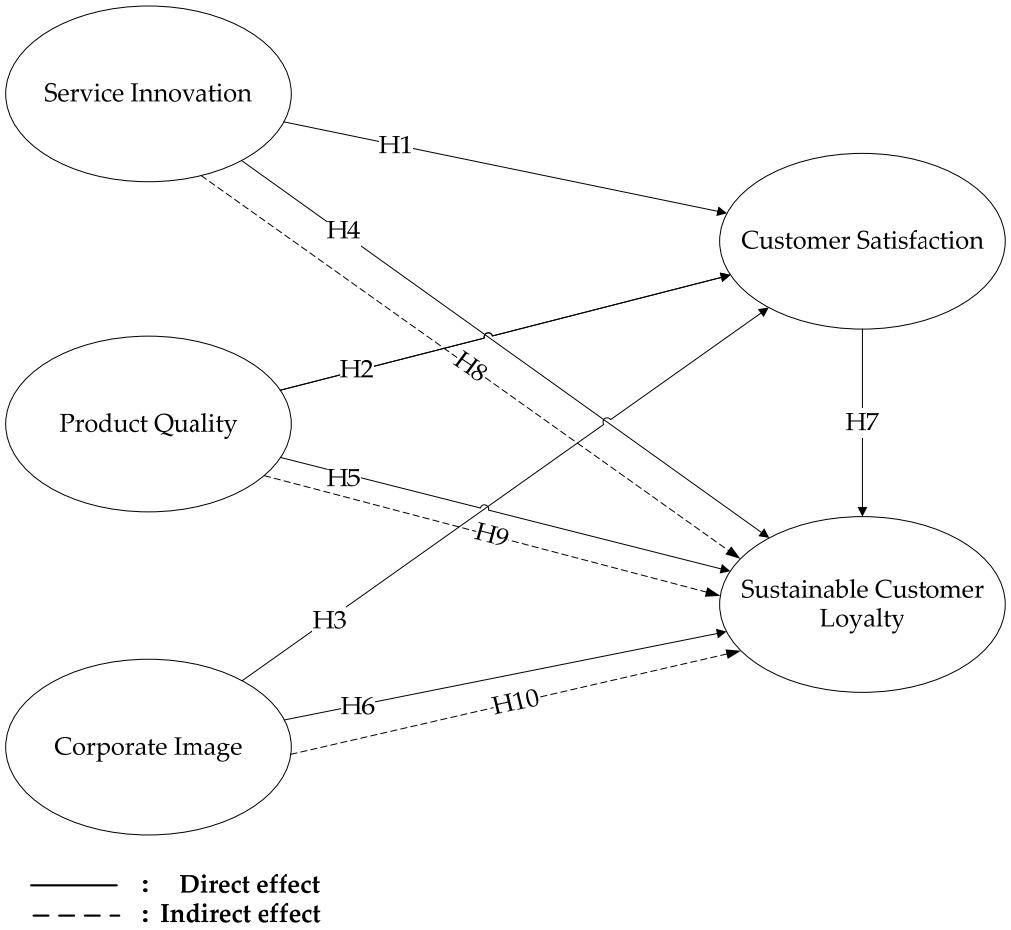

Figure 1. Research hypothesis model.

3. Methods

3.1. Measurement of Research Variables

In this study, the construction steps of previous research have been adjusted to meet the research needs. All variables in this study are measured using a five-point Likert scale. The variables used in this study include service innovation, product quality, corporate image, customer satisfaction, and sustainable customer loyalty. The measurement of each research variable was adopted from several previous studies that listed these research variables, which are summarized in detail in Table 1.

Although the questionnaire items were derived from well-established sources, a pilot test was conducted with 30 randomly selected participants before proceeding with the main study. This was carried out to revise and refine the questionnaire items, ensuring their content validity and reliability. Based on the results of the pilot test, several items were reviewed and adjusted accordingly.

Table 1. Summary of research variable measurements from previous studies.

Variable	Indicators	Items	Sources
Service Innovation (SI)	Interactive Service Innovation (SI1)	(a) The company frequently interacts with customers to understand their needs. (b) Services provided by the company are tailored to the marketing region. (c) The company interacts with customers through distributors to ensure service satisfaction.	[31,72]
	Supportive Service Innovation (SI2)	(a) Service procedures at the company meet customer needs. (b) The company routinely evaluates its services to improve quality. (c) The company provides services quickly. (d) The company handles customer complaints well.	
	Digital Innovation (SI3)	(a) The company provides services that can be accessed through mobile devices. (b) The digital services provided by the company are easy to use. (c) The company provides service feedback quickly through digital platforms.	
Product Quality (PQ)	Product Durability (PQ1)	(a) Good durability in long-term use. (b) Good durability in long-term storage. (c) Function remains good in extreme conditions.	[13,73,74]
	Product Characteristics (PQ2)	(a) Information about the company's petrochemical products is easily accessible and available. (b) The company's petrochemical products meet the promised standard specifications. (c) The company's final petrochemical products have good quality.	
	Product Reliability (PQ3)	(a) The company's petrochemical products are always available when needed. (b) The company's petrochemical products are reliable for the desired end applications. (c) The quality of the company's petrochemical products is consistent over time. (d) The quantity of petrochemical products ordered always matches what is received.	
Corporate Image (CI)	Reputation (CI1)	(a) The company receives positive recognition from third parties. (b) The company is widely known by the public and customers. (c) The company has a good reputation in the eyes of customers.	[75,76]
	Credibility (CI2)	(a) Customers have trust in the information provided by the company. (b) The company demonstrates high integrity in all its activities. (c) The company is transparent in conveying information to customers. (d) The company's employees show professionalism in serving customers.	

Table 1. *Cont.*

Variable	Indicators	Items	Sources
Customer Satisfaction (CS)	Fulfillment of Expectations Level (CS1)	(a) The transaction procedures with the company are very efficient. (b) The sales staff of the company are very knowledgeable about the technical aspects of the petrochemical products offered. (c) The price of the company's petrochemical products is very competitive compared to competitor petrochemical products. (d) The services provided by the company are better compared to those of competitor companies.	[77,78]
	Complaint Resolution Level (CS2)	(a) The company is effective in prioritizing the resolution of customer complaints. (b) The company quickly resolves customer complaints. (c) The company's sales staff have good capabilities in resolving customer complaints.	
Sustainable Customer Loyalty (SCL)	Repurchase (SCL1)	(a) Customers are very likely to repurchase petrochemical products from the company. (b) Previous experiences with the company's petrochemical products influence customers' decisions to repurchase. (c) Customers have a positive perception of the company's petrochemical products, which makes them want to repurchase. (d) The service provided by the company encourages customers to repurchase. (e) The price of the company's petrochemical products matches the value customers receive, making them want to repurchase.	[70,79,80]
	Recommendation (SCL2)	(a) Customers are very likely to recommend the company's petrochemical products to others. (b) Customers' experiences with the company's products influence their decision to recommend these petrochemical products to others. (c) Customers have a positive perception of the company's products, which makes them want to recommend them. (d) The service provided by the company encourages customers to recommend these petrochemical products to others. (e) The price of the company's products matches the value customers receive, making them want to recommend them to others.	
	Customer retention (SCL3)	(a) Customers frequently purchase petrochemical products from the company. (b) Customers have been with the company for a long time. (c) Customers rarely switch to other products besides the company's petrochemical products.	

3.2. Data Collection and Sampling

The population used in this study includes 120 companies that have been corporate clients of Pertamina Patra Niaga in terms of energy provision. Due to the small size of the existing population and all companies being eligible for study, the suitable sampling technique to be used is saturated sampling. The use of this sampling technique involves the entire population to be the research sample, so n = N = 120 companies. In an effort to obtain more focused and in-depth insights, the respondents in this study are one to two individuals representing each corporate customer company, thus targeting 240 respondents.

This study collected data through an online questionnaire survey to test the proposed hypotheses. In the data collection process, email invitations containing links to the survey questionnaire were sent to each company's leaders—specifically, the leader/owner/CEO/director or at least the procurement manager who can understand and provide an assessment/perception of the variables used in the research. To ensure ethical compliance in this online study, we implemented measures to guarantee respondent confidentiality and secure informed consent digitally. Respondents were informed that their data would be kept confidential through an introductory statement at the start of the online survey. Personal identifiers were not collected; instead, unique identification codes were used to maintain anonymity, and the data were securely stored in a password-protected database, accessible only to the research team. Before participating, the respondents were required to read an informed consent statement displayed on the first page of the online survey, which outlined the study's purpose, procedures, potential risks and benefits, and the voluntary nature of participation. Consent was obtained through an "I agree" button, allowing respondents to proceed with the survey, while those who did not consent were directed out of the survey.

The questionnaire provided detailed information about the study and how to fill out the research questionnaire. Out of the targeted 240 respondents, a total of 200 responses/questionnaires were successfully collected and used for analysis. Among the 200 responses obtained, there were no questionnaire responses discarded due to incomplete answers. Finally, 200 questionnaires were deemed valid for this study, with a valid response rate of 83.3%.

In determining the appropriate sample size for our PLS-SEM analysis, we conducted a power analysis using G*Power (Department of Psychology at the University of Düsseldorf, Düsseldorf, Germany). With a medium effect size ($f^2 = 0.15$), an alpha level of 0.05, a power of 0.95, and three predictors, the required sample size was calculated to be 89. Given our actual sample size of 200, the power of our study exceeds the minimum required power of 0.95. This larger sample size enhances the precision of our estimates, increases the robustness of our findings, and allows for the detection of smaller effects. By using a sample size of 200 respondents, this study benefits from greater statistical power and reliability, ensuring that the relationships investigated in this study are detected more robustly and accurately.

3.3. Analytical Methodology and Model Validation

Partial Least Squares Structural Equation Modeling (PLS-SEM) analysis will be used to validate these hypotheses to better understand the relationships between variables. This model will help us determine the mediating function of customer satisfaction in the relationship between service innovation, product quality, corporate image, and sustainable customer loyalty. The proposed research model will be tested using Smart PLS 4.0 software. Through two testing steps—measurement model assessment and structural model evaluation (PLS-SEM)—the proposed research model and hypotheses will be thoroughly examined [81].

4. Results

4.1. Demographic Profile of Respondents

The respondents in this study, drawn from 120 companies that are corporate clients of Pertamina Patra Niaga, provided 200 valid responses, with an 83.3% response rate. They include Leaders or Owners (24.5%), CEOs (29.5%), Directors (26%), and Procurement Managers (20%), offering comprehensive insights into strategic and operational aspects. Experience levels range from 1–5 years (14.5%) to over 20 years (5%), ensuring a well-rounded perspective. Educational backgrounds are diverse, with 48.5% holding Bachelor's degrees, 41% Master's degrees, and 10.5% Doctorate degrees. In terms of company size, 59% of respondents come from medium-sized companies (51–200 employees), 31% come from large companies (201–500 employees), and 10% come from very large companies

(501+ employees). This demographic profile provides a solid foundation for analyzing procurement practices and decision-making in the oil and gas industry.

4.2. Measurement Model Assessment

Following the approach outlined by [82], this study utilized a two-step procedure to evaluate the relationships between factors in the proposed model. Initially, the measurement model was examined to determine the reliability and validity of the instrument before proceeding to test the research hypotheses in the structural model.

Confirmatory factor analysis was performed using SmartPLS 4.0 to assess the suitability and validity of the measurement model. Parameter estimation was carried out using the maximum likelihood method, with all analyses conducted on a variance–covariance matrix [83]. Prior to further analysis, it was crucial to check for multicollinearity. As stated by [84], multicollinearity arises when two or more variables are highly correlated. To detect multicollinearity, this study employed the variance inflation factor (VIF). Multicollinearity is not considered a problem if the outer VIF value is below 10 [85]. In this study, all independent constructs had outer VIF values less than 10, indicating no multicollinearity issues.

From Table 2, it can be concluded that product quality, service innovation, customer satisfaction, corporate image, and sustainable customer loyalty are generally rated highly by respondents, as indicated by the consistently high mean scores above 4.0 for all indicators. The reliability levels of each variable, as shown by the Cronbach's α values, are robust, indicating that the survey instruments used in this research are reliable in measuring the desired constructs. Furthermore, all indicators have strong loading factors, suggesting they are valid representations of the variables they measure. The absence of serious multicollinearity issues, as indicated by the VIF values below 10 for all indicators, demonstrates that the measurement model has good statistical stability. This confirms that the variables in the model have independent relationships with each other, allowing for clear interpretations of each's influence on broader research constructs.

Table 2. Descriptive statistics, loading factor, reliability, and multicollinearity testing for research variables.

Variable	Indicator	SD	Mean	Loading Factor	Cronbach's α	Outer VIF
SI	SI1	0.760697	4.03	0.733	0.748	1.408
	SI2	0.753262	4.056667	0.778		1.146
	SI3	0.559283	4.276667	0.773		1.472
PQ	PQ1	0.471357	4.173333	0.876	0.858	2.084
	PQ2	0.466451	4.153333	0.900		2.278
	PQ3	0.451859	4.153333	0.872		2.120
CI	CI1	0.518297	4.04	0.914	0.877	2.559
	CI2	0.468472	4.0775	0.967		2.559
CS	CS1	0.381291	4.388	0.968	0.914	3.412
	CS2	0.431759	4.346	0.949		3.412
SCL	SCL1	0.552937	4.203333	0.917	0.841	4.201
	SCL2	0.545677	4.285	0.921		4.129
	SCL3	0.620468	4.216667	0.775		1.417

Subsequently, several goodness-of-fit indices were used to evaluate the model's adequacy [86]. Although the minimum fit function χ^2 was calculated, it was found to be overly sensitive to sample size and not always the best measure of model fit [87]. Instead, the ratio of χ^2 to its degrees of freedom (χ^2/df) was utilized, with values less than three indicating a good fit [88]. Additional fit indices recommended by [87] were also considered, including the normed fit index (NFI) and root mean square residual (RMSR).

The fit summary in Table 3 provides a comprehensive evaluation of our model's alignment with the observed data, underscored by several key fit indices. The chi-square value

of 489.712, with a *p*-value less than 0.05, initially suggests a significant result, which often points to some degree of misfit. However, considering the chi-square's notorious sensitivity to sample size, especially in large datasets, this metric alone does not paint the full picture. Instead, we delve deeper into other fit indices for a more nuanced understanding of the model's performance.

Table 3. Model fit summary and recommended values.

Fit Summary	Recommended Value	Estimated Model
Chi-square	*p*-value < 0.05	489.712
df	n/a	246
Ratio of chi-square on df	Preferable < 3	1.987
NFI	>0.90	0.972
RMSR	<0.08	0.049

Operating with 246 degrees of freedom, our model strikes a balance between complexity and parsimony. This balance is further reflected in the ratio of chi-square to degrees of freedom, which stands at 1.987. Falling comfortably below the recommended threshold of three, this ratio indicates that our model manages to capture the data's underlying structure without overfitting, suggesting a good fit. The NFI provides additional reassurance, clocking in at an impressive 0.972. This metric compares the fit of our proposed model against a null model, with values above 0.90 typically signaling a robust fit. An NFI of 0.972 not only underscores the model's superior performance relative to the null but also highlights its overall strength in mirroring the data. Adding to this, the RMSR is 0.049, which is below the 0.08 threshold, suggesting minimal discrepancies between observed and predicted values. The low RMSR value indicates that the residuals, or the differences between the observed and model-predicted values, are minimal, further affirming the model's adequacy. In conclusion, the model demonstrates excellent fit across multiple indices. The favorable chi-square ratio, high NFI, and low RMSR collectively indicate that our model effectively captures the underlying structure of the data.

Convergent validity was evaluated to confirm that each construct is accurately represented by its own indicators [89], ensuring the unidimensionality of the constructs and eliminating unreliable indicators [90]. Discriminant validity was assessed to ensure that measures of different constructs are statistically distinct [89]. According to [83], reliability, convergent validity, and discriminant validity were evaluated using the composite reliability (CR), average variance extracted (AVE), and heterotrait–monotrait ratio (HTMT). Reliability is established when CR values are at least 0.6 and preferably above 0.7. Convergent validity is demonstrated when AVE values are at least 0.5 and CR values are greater than AVE values. Discriminant validity is confirmed when the HTMT is less than 0.90 [91].

In Table 4, the CR values for all constructs ranged from 0.805 to 0.958, surpassing the threshold of 0.7. This indicates strong internal consistency reliability across all latent constructs. Additionally, the AVE values varied from 0.580 to 0.919, all exceeding the minimum requirement of 0.5. This confirms the satisfactory convergent validity of the measurement model, as each construct captures a substantial amount of variance relative to the measurement error. Moreover, the HTMT values provide insights into discriminant validity. HTMT values below 0.9 suggest that the constructs are sufficiently distinct from each other, supporting adequate discriminant validity.

Table 5, showing inner VIF values for common method bias detection, provides important insights into the measurement model used in the research [92]. The VIF values are notably low, all staying well under the commonly accepted threshold. This suggests that each construct within the model maintains distinctiveness from one another, supporting the discriminant validity of the model. The low risk of common method bias, as indicated by these VIF values, ensures that the relationships observed between constructs are likely to be due to their theoretical connections rather than a byproduct of the measurement method itself. Consequently, the study's findings on the relationships between these constructs can

be considered reliable and indicative of true effects, making the research conclusions both valid and actionable.

Table 4. Convergent validity, discriminant validity, and composite reliability.

Factor	AVE	CR	SI	PQ	CI	CS
SI	0.580	0.805				
PQ	0.778	0.913	0.352			
CI	0.885	0.939	0.184	0.230		
CS	0.919	0.958	0.202	0.186	0.084	
SCL	0.763	0.906	0.474	0.455	0.296	0.456

Table 5. Inner VIF for common method bias detection.

	CS	SCL
SI	1.093	1.108
PQ	1.118	1.138
CI	1.050	1.051
CS		1.046

4.3. Structural Model Assessment

As can be shown in Table 6, the SEM analysis results reveal significant insights into the relationships between key variables in the research model. First, while Service Innovation (SI) and Corporate Image (CI) show positive associations with Customer Satisfaction (CS), these relationships are not statistically significant, as indicated by their respective *p*-values of 0.149 and 0.824. Conversely, Product Quality (PQ) demonstrates a significant positive impact on CS, supported by a low *p*-value of 0.034. Furthermore, the analysis underscores the crucial role of these factors in shaping Sustainable Customer Loyalty (SCL). Both SI and PQ exhibit strong positive influences on SCL, with path coefficients of 0.217 and 0.240, respectively, both supported by highly significant *p*-values of 0.001. Similarly, CI also demonstrates a significant positive relationship with SCL, albeit with a slightly lower path coefficient of 0.170 and a *p*-value of 0.003. Additionally, the robust relationship between SCL and CS is highlighted, with a substantial path coefficient of 0.315 and a highly significant *p*-value of 0.000, suggesting that higher levels of SCL are associated with increased CS. These findings collectively emphasize the critical role of product quality and service innovation in driving both customer satisfaction and loyalty within the studied context, underscoring their significance for businesses aiming to enhance customer relationships and retention strategies.

Table 6. SEM analysis results.

Hypothesis	Path	Path Coefficient	*p*-Values	Results
Direct Effect				
H1	SI → CS	0.120	0.149	Not significant
H2	PQ → CS	0.136	0.034	Significant
H3	CI → CS	0.015	0.824	Not significant
H4	SI → SCL	0.217	0.001	Significant
H5	PQ → SCL	0.240	0.001	Significant
H6	CI → SCL	0.170	0.003	Significant
H7	SCL → CS	0.315	0.000	Significant
Indirect Effect				
	SI → CS → SCL	0.038	0.154	Not significant
	PQ → CS → SCL	0.043	0.041	Significant
	CI → CS → SCL	0.005	0.829	Not significant

The regression analysis for CS and SCL indicates varied predictive capabilities within the model. For CS, the low R^2 value of 0.044 (adjusted R^2 = 0.029) implies that the model only explains a minimal 4.4% of the variance, suggesting limited predictive effectiveness for this variable. Conversely, SCL displays a considerably stronger relationship with the model, with an R^2 value of 0.344 (adjusted R^2 = 0.330), indicating that about 34.4% of its variance is accounted for by the model. This demonstrates a moderate predictive power, considerably better than that for CS. Additionally, the overall Q^2 value of 0.372704 further substantiates that the model possesses moderate predictive relevance, particularly highlighting its capability to forecast outcomes related to SCL more effectively than CS.

5. Discussions

5.1. Service Innovation and Customer Satisfaction

The study results indicate that service innovation (SI) does not have a significant impact on customer satisfaction, with a *p*-value of 0.149. This finding contrasts with the extensive body of literature suggesting that service innovation directly enhances customer satisfaction. For instance, Ref. [28] argue that the implementation of cutting-edge technology, new business models, and personalized services creates unique and efficient experiences that meet the evolving needs of customers. Ref. [29] further emphasize that innovative technological solutions streamline processes, reduce waiting times, and provide faster access, thereby enhancing customer perceptions of service quality. Additionally, Ref. [30] highlight that differentiation through service innovation in competitive markets can enhance a company's competitive advantage. Ref. [31] also stress that a deep understanding of customer preferences enables more personalized and relevant service strategies, which strengthen customer relationships and build loyalty.

However, in the context of the petrochemical industry, the study's results suggest that customers may not perceive immediate benefits from service innovation in the same way. This industry is characterized by its complex and technical nature, where the primary concerns of customers are often related to the operational efficiency, safety, and reliability of products and services. While service innovations like advanced technologies and new business models are crucial, their impact on customer satisfaction might not be immediately evident.

Several factors could explain this discrepancy. First, the petrochemical industry operates on long-term contracts and relationships, meaning that the benefits of service innovations may take time to manifest in terms of customer satisfaction. Customers in this sector likely prioritize innovations that lead to long-term operational improvements, such as enhanced safety protocols, reduced downtime, and more efficient processes, over innovations that provide immediate but less substantial benefits. Second, the tangible benefits of service innovation, such as reduced waiting times and faster access, may be less impactful in this industry, where the emphasis is on the reliability and safety of the products. While technological advancements and new service models are undoubtedly important, their primary value may lie in their ability to support these core concerns rather than in directly enhancing immediate customer satisfaction. Furthermore, the study suggests that corporate customers in the petrochemical industry may place a higher value on the functional and operational aspects of service innovations, such as improved efficiency and cost reduction, rather than on the immediate experience enhancements that these innovations might provide. This aligns with the industry's focus on minimizing operational risks and ensuring consistent product performance.

In light of these findings, it becomes apparent that while service innovation is vital for maintaining competitive advantages and long-term customer engagement in the petrochemical industry, its immediate impact on customer satisfaction may not be as pronounced as in other sectors. Companies like Pertamina Patra Niaga might need to focus on demonstrating the long-term operational benefits of their service innovations to their customers, emphasizing how these innovations contribute to enhanced reliability, safety, and efficiency over time. This approach would help align the company's innovation strategies with

the specific needs and priorities of its customers in the petrochemical sector, ultimately supporting sustained customer satisfaction and loyalty.

5.2. Product Quality and Customer Satisfaction

Product quality has a significant impact on customer satisfaction, with a *p*-value of 0.034. This finding aligns with the extensive literature indicating that high-quality products are critical for achieving high levels of customer satisfaction. Ref. [35] emphasize that high-quality products, which include attributes such as reliability, durability, and features that meet or exceed customer expectations, create positive experiences and enhance trust, leading to sustainable satisfaction. In the petrochemical industry, the importance of product quality is magnified due to its direct impact on safety, reliability, and efficiency in various applications.

The petrochemical industry is inherently complex and technically demanding, where the reliability and performance of products are crucial. High-quality products in this sector are essential because any failure or defect can have significant repercussions, including operational disruptions, safety hazards, and substantial financial losses. Therefore, maintaining high standards of product quality is not just a business imperative but a critical aspect of ensuring customer satisfaction and trust.

According to Ref. [36], dissatisfaction with product quality can severely damage a company's image and erode customer trust. In the context of Pertamina Patra Niaga, ensuring that their products consistently meet high-quality standards is crucial for building and maintaining strong relationships with their corporate customers. High-quality products help in minimizing operational risks, ensuring safety, and enhancing the overall efficiency of customer operations. This reliability is particularly valued in the petrochemical industry, where the stakes are high and the cost of failure is substantial.

Moreover, the study's findings highlight that customers in the petrochemical industry place a high value on product quality because it directly influences their operational success and safety. Products that are reliable and durable reduce the likelihood of unexpected failures and maintenance issues, which can disrupt operations and incur additional costs. By providing high-quality products, Pertamina Patra Niaga can enhance customer satisfaction by ensuring that their products perform consistently and reliably in demanding industrial environments.

The emphasis on high-quality products also reinforces long-term customer relationships and loyalty. When customers receive products that meet or exceed their expectations, they develop a sense of trust and confidence in the supplier. This trust is crucial for fostering long-term business relationships, as satisfied customers are more likely to remain loyal and continue their business with the company. Furthermore, high-quality products contribute to a positive brand image, which can differentiate the company from its competitors and attract new customers.

5.3. Corporate Image and Customer Satisfaction

The study results show that corporate image does not have a significant impact on customer satisfaction, with a *p*-value of 0.824. This contrasts with extensive literature suggesting that a positive corporate image plays a crucial role in shaping customer satisfaction. Ref. [22] highlight that a positive corporate image reflects a good reputation and fosters trust and loyalty. Furthermore, aspects such as business ethics, social responsibility, and company values help differentiate the company from its competitors, providing a sense of security and enhancing perceptions of quality, reliability, and integrity [39]. Ref. [40] also suggest that a strong corporate image raises customer expectations, strengthens long-term relationships, and makes customers less vulnerable to competition.

In the petrochemical industry, the environmental and social implications of the company's operations make a positive corporate image particularly vital. A strong corporate image can demonstrate a company's commitment to environmental stewardship, social responsibility, and ethical business practices, which are increasingly important to stakehold-

ers. However, the study's findings indicate that in the context of Pertamina Patra Niaga, corporate image does not significantly influence customer satisfaction. This discrepancy may be attributed to several factors inherent in the industry.

Firstly, customers in the petrochemical industry may prioritize tangible aspects such as product quality and service innovation over the corporate image. Given the technical and operational demands of this industry, customers might focus more on the functional benefits they receive from the products and services. High product reliability, efficiency, and innovation may be more immediate and critical concerns for these customers than the broader, more abstract concept of corporate image. Second, while a positive corporate image can enhance overall perceptions and trust, its impact on immediate satisfaction might be overshadowed by the more direct and measurable outcomes of product performance and service quality. In industries where safety, operational continuity, and compliance with stringent regulations are paramount, the direct contributions of high-quality products and innovative services to operational success may have a more pronounced effect on customer satisfaction.

Furthermore, the established trust in a company's capability to deliver reliable and high-quality products may mitigate the immediate impact of corporate image on satisfaction. Customers might already assume a certain level of integrity and ethical conduct from well-established companies in this sector, making additional corporate image enhancements less impactful in terms of altering customer satisfaction levels. However, it is essential to recognize that while corporate image might not significantly influence immediate customer satisfaction, it still plays a crucial role in long-term customer loyalty and overall reputation. A strong corporate image helps in differentiating the company in a competitive market, attracting new customers, and retaining existing ones by reinforcing trust and loyalty over time. It contributes to building a resilient brand that can withstand market fluctuations and competitive pressures.

5.4. Service Innovation and Sustainable Customer Loyalty

The study results indicate that service innovation has a significant impact on sustainable customer loyalty, with a *p*-value of 0.001. This finding aligns with the literature suggesting that service innovation plays a crucial role in fostering long-term customer loyalty. Ref. [43] emphasize that service innovation creates unique and satisfying experiences for customers, which encourages them to remain loyal to a brand or company. In the context of the petrochemical industry, service innovation is particularly vital due to the complex and technical nature of the products and services offered.

Service innovation differentiates a brand from its competitors, establishing a positive image in the minds of customers. By continuously evolving and incorporating advancements in technology, companies can offer enhanced digital solutions and applications that facilitate better interactions with customers. This is particularly important in the highly technical and competitive petrochemical sector, where efficient communication and service delivery are crucial.

In the petrochemical industry, the implementation of service innovations such as advanced digital platforms, real-time monitoring systems, and customized service offerings can significantly enhance customer experiences. These innovations streamline processes, reduce waiting times, and provide faster and more accurate responses to customer needs. By leveraging technology, companies can create a more efficient and responsive service environment, which is highly valued by customers in this sector. Furthermore, service innovation contributes to building a positive corporate image, which, as noted by [43], enhances customer perceptions and trust. A company that consistently invests in innovative solutions demonstrates a commitment to improving customer experiences and staying ahead of industry trends. This not only strengthens customer loyalty but also attracts new customers who seek reliable and forward-thinking service providers.

The interconnectedness of service innovation, product quality, and corporate image plays a significant role in shaping sustainable customer loyalty. High-quality products

ensure reliability and efficiency, meeting the core operational needs of customers. A strong corporate image built on ethical practices and social responsibility further reinforces trust and loyalty. When combined with innovative service offerings, these elements create a comprehensive value proposition that appeals to customers on multiple levels.

In the petrochemical industry, where the technical demands and stakes are high, service innovation helps companies like Pertamina Patra Niaga maintain a competitive edge. By continuously improving and adapting their services to meet evolving customer needs, these companies can foster long-term relationships and ensure customer loyalty. The ability to provide customized and efficient service solutions not only meets immediate customer needs but also builds a foundation for sustained loyalty. Moreover, as the industry becomes more digitized, the role of service innovation becomes even more critical. Digital solutions such as predictive maintenance tools, IoT-enabled monitoring systems, and advanced customer service platforms enhance operational efficiency and customer satisfaction. These innovations provide customers with valuable insights, proactive support, and a seamless service experience, all of which contribute to their overall loyalty.

5.5. Product Quality and Sustainable Customer Loyalty

Product quality has a significant impact on sustainable customer loyalty, with a *p*-value of 0.001. This finding is consistent with the literature, which underscores the central role of product quality in building long-term customer loyalty. Ref. [49] emphasize that superior products foster trust and satisfaction among customers, which are essential components of sustainable loyalty. In the petrochemical industry, where products have critical applications across various sectors, maintaining high product quality is crucial.

High-quality products in the petrochemical industry ensure operational reliability, safety, and efficiency, which are paramount for customers who rely on these products for their own industrial processes. Any compromise in product quality can lead to significant operational disruptions, safety hazards, and financial losses. Therefore, customers in this industry place a high value on the quality of the products they use, as it directly impacts their operational success and safety. The study's findings align with the notion that high product quality enhances the overall brand image. Satisfied customers are more likely to provide positive testimonials and recommend the brand to others. This word-of-mouth marketing is powerful in the petrochemical industry, where reputation and reliability are key factors in business relationships. When a company consistently delivers high-quality products, it not only meets but often exceeds customer expectations, creating a positive brand perception.

Furthermore, providing products that exceed expectations helps in creating emotional bonds with customers. These emotional connections are crucial for developing strong and sustainable relationships in the long run. Customers who feel valued and satisfied with the product quality are more likely to remain loyal to the brand, even when faced with competitive alternatives. This loyalty is reinforced by the trust that high-quality products inspire, ensuring that customers continue to choose the same brand for their critical needs. In the context of Pertamina Patra Niaga, maintaining rigorous quality control standards and continuously striving to improve product quality are essential strategies for fostering sustainable customer loyalty. The company's commitment to delivering superior products ensures that customers can rely on their products for critical applications, reinforcing trust and satisfaction. This approach not only helps in retaining existing customers but also attracts new ones who seek reliable and high-quality products.

Additionally, high product quality contributes to building a positive corporate image, which further strengthens customer loyalty. As [49] suggest, satisfied customers who receive high-quality products are more likely to develop a strong attachment to the brand, leading to long-term loyalty. This attachment is built on the consistent performance and reliability of the products, which are critical factors in the petrochemical industry.

5.6. Corporate Image and Sustainable Customer Loyalty

Corporate image has a significant impact on sustainable customer loyalty, with a *p*-value of 0.003. This finding aligns with the literature that underscores the importance of corporate image in building long-term customer loyalty. Ref. [53] highlight that a positive corporate image fosters trust, loyalty, and emotional affiliation with the brand, which are essential components of sustainable customer loyalty.

In the petrochemical industry, maintaining a strong and consistent corporate image is crucial due to the environmental and social scrutiny the sector faces. A robust corporate image reassures customers that they will continue to receive positive experiences and added value from the brand. This reassurance is particularly important in an industry where customers are highly concerned with the environmental impact and social responsibilities of the companies they engage with. A positive corporate image is built on several key factors, including a company's commitment to brand values, delivering consistent customer experiences, and transparent communication. Demonstrating a commitment to ethical practices and social responsibility can significantly enhance a company's image. For instance, when a petrochemical company like Pertamina Patra Niaga showcases its efforts in environmental sustainability and social initiatives, it builds trust and strengthens its reputation as a responsible and reliable partner.

Customers in the petrochemical industry are likely to remain loyal to companies that they perceive as trustworthy and aligned with their own values. By consistently delivering high-quality products and innovative services while maintaining a strong corporate image, companies can create a sense of security and reliability among their customers. This emotional affiliation is crucial for fostering long-term loyalty, as customers are more likely to stick with brands they trust and respect. Furthermore, a strong corporate image can differentiate a company from its competitors. In a competitive market, where many companies offer similar products and services, a positive corporate image can be a key differentiator. Customers are more likely to choose and remain loyal to a brand that is not only known for its high-quality offerings but also for its ethical conduct and social responsibility. This differentiation is vital in the petrochemical industry, where the stakes are high and the impact of corporate actions is closely monitored by various stakeholders.

The study's findings suggest that Pertamina Patra Niaga can enhance sustainable customer loyalty by continuously promoting and upholding a positive corporate image. This involves not only adhering to high ethical standards and social responsibilities but also effectively communicating these efforts to their customers. Transparency in operations and clear communication about the company's values and initiatives can further solidify the trust and loyalty of their customer base.

5.7. Customer Satisfaction and Sustainable Customer Loyalty

The study results indicate that customer satisfaction has a significant impact on sustainable customer loyalty, with a *p*-value of less than 0.001. This finding aligns with the extensive literature underscoring the importance of customer satisfaction in fostering long-term loyalty. Ref. [57] highlight that customer satisfaction can establish a strong foundation for a long-term relationship between customers and the company. In the context of the petrochemical industry, satisfied customers are more likely to remain loyal and make repeat purchases, as indicated by [59].

Customer satisfaction creates emotional bonds and positive perceptions of the brand, forming a solid basis for loyalty. When customers feel that their needs and expectations are met or even exceeded, they develop a strong affinity towards the company. This is crucial in the highly competitive and technically demanding petrochemical sector, where the ability to deliver high-quality products and services consistently is essential. The positive experiences fostered by high levels of customer satisfaction contribute to a sense of trust, which is a key element in nurturing long-term relationships, as noted by [62].

In the petrochemical industry, where the nature of products and services is inherently complex, customer satisfaction plays a particularly vital role. Satisfied customers tend to

be more tolerant of imperfections or issues that may arise, as they believe that the company will address these complaints effectively. This tolerance is especially important given the potential for operational disruptions and safety concerns associated with petrochemical products. When customers trust that the company will resolve their issues satisfactorily, they are more likely to maintain their loyalty despite occasional problems.

Furthermore, customer satisfaction significantly contributes to a positive brand image. Satisfied customers are inclined to provide positive testimonials, offer good feedback, and recommend the company's products or services to others. Ref. [64] emphasize that recommendations from satisfied customers can be the most effective marketing tool, helping the company attract new customers and expand its customer base. In the petrochemical industry, where trust and reliability are paramount, positive word-of-mouth can significantly enhance the company's reputation and market reach.

Additionally, customer satisfaction reinforces the company's commitment to quality and service excellence. When customers consistently experience high levels of satisfaction, it reflects the company's dedication to meeting their needs and expectations. This not only strengthens existing customer relationships but also builds a robust foundation for attracting new customers who value reliability and high standards. The impact of customer satisfaction on sustainable customer loyalty underscores the importance of a customer-centric approach in the petrochemical industry.

5.8. Customer Satisfaction as a Mediator

The indirect effect of service innovation on sustainable customer loyalty through customer satisfaction shows a path coefficient of 0.038, with a *p*-value of 0.154, which is not significant. This result suggests that customer satisfaction does not significantly mediate the relationship between service innovation and sustainable customer loyalty in the petrochemical sector. This finding does not support the results from [65,66], which indicated that service innovation positively impacts customer satisfaction and, subsequently, customer loyalty. In the petrochemical industry, technical and operational efficiency improvements might be valued more than service innovation. Customers in this sector might prioritize consistent product quality and reliability over new or improved service features. Therefore, while service innovation might enhance customer satisfaction in other sectors, it might not have a significant impact on sustainable customer loyalty in the petrochemical sector.

The indirect effect of product quality on sustainable customer loyalty through customer satisfaction reveals a path coefficient of 0.043 with a *p*-value of 0.041, which is significant. This result indicates that customer satisfaction significantly mediates the relationship between product quality and sustainable customer loyalty. This finding supports the research by [67–69], which highlighted the critical role of product quality in enhancing customer satisfaction and loyalty. In the petrochemical industry, maintaining high product quality is crucial due to stringent technical and safety standards. High-quality products lead to greater customer satisfaction, as they meet or exceed the technical requirements and safety expectations of customers. This satisfaction translates into sustainable loyalty, as customers are likely to remain with a supplier who consistently delivers reliable and high-quality products.

The indirect effect of corporate image on sustainable customer loyalty through customer satisfaction shows a path coefficient of 0.005, with a *p*-value of 0.829, which is not significant. This result shows that customer satisfaction does not significantly mediate the relationship between corporate image and sustainable customer loyalty. This finding does not align with the studies by [53,70,71], which suggested that corporate image positively impacts customer satisfaction and loyalty. In the petrochemical sector, while a strong corporate image can influence initial trust and attract customers, it might not significantly impact ongoing customer satisfaction and loyalty without the support of high product quality and reliable services. Customers in this industry may place more emphasis on the tangible aspects of product performance and operational reliability over corporate image

alone. Therefore, even a strong corporate image may not substantially drive sustainable customer loyalty unless it is coupled with excellent product quality and service reliability.

The analysis reveals that, in the petrochemical sector, customer satisfaction significantly mediates the effect of product quality on sustainable customer loyalty but does not significantly mediate the effects of service innovation and corporate image. These findings suggest that maintaining high product quality is essential for fostering sustainable customer loyalty in this industry. Service innovation and corporate image, while important, might not have as strong an impact on customer loyalty without the foundational assurance of product quality and reliability. This emphasizes the need for petrochemical companies to focus on delivering consistently high-quality products to achieve long-term customer loyalty.

6. Research Implications

Despite the limitations above, the study offers significant theoretical, practical, and social implications that can inform both academic research and managerial practice.

(1) The research makes substantial theoretical contributions by integrating service innovation, product quality, and corporate image into a comprehensive model of sustainable customer loyalty, with customer satisfaction serving as a mediating factor. This integrated approach addresses a notable gap in the literature, particularly within the petrochemical industry, and provides a more holistic understanding of the interplay between these critical variables. The findings underscore the importance of examining multiple factors simultaneously to capture the complexity of sustainable customer loyalty dynamics.

(2) For managers and decision-makers in the petrochemical industry, the findings highlight key areas to focus on to enhance sustainable customer loyalty. Emphasizing continuous improvement in product quality and service innovation is crucial. High-quality products not only meet customer expectations but also foster trust and long-term satisfaction. Service innovation, while not directly linked to immediate satisfaction, plays a significant role in maintaining sustainable customer loyalty through the creation of unique and efficient customer experiences. Managers should also prioritize building and maintaining a positive corporate image, as it significantly influences sustainable customer loyalty. Transparent communication, ethical business practices, and community engagement are vital strategies for enhancing corporate reputation and customer trust.

(3) The insights from this research also can inform strategic planning and decision-making processes within companies. By understanding the critical role of product quality and service innovation, companies can design marketing and customer relationship management strategies that foster sustainable customer loyalty. This involves not only delivering high-quality products and innovative services but also actively managing the corporate image through consistent and transparent communication and engagement with stakeholders.

(4) The research also offers significant social implications by highlighting how the petrochemical sector, often criticized for its environmental and social impact, can benefit greatly from integrating sustainability into its core business strategies. By focusing on service innovation and product quality, companies in this sector can reduce their environmental footprint, promoting a more sustainable approach to production and consumption. Furthermore, enhancing corporate image through ethical business practices and community engagement not only builds customer trust but also fosters stronger community relations and social responsibility. These practices contribute to a broader societal shift towards sustainability, encouraging other industries to adopt similar measures. In doing so, the petrochemical sector can play a pivotal role in driving sustainable development, aligning with global sustainability goals and contributing to a healthier environment and society. Policymakers can leverage these insights to advocate for policies that encourage sustainable practices, ensuring

that the industry's growth does not come at the expense of social and environmental well-being.

7. Limitations and Future Research Directions

While this study offers significant insights into the factors influencing sustainable customer loyalty in the petrochemical industry, several limitations should be acknowledged to provide a comprehensive understanding of its scope and applicability:

(1) The study was conducted using a sample of 120 companies, all corporate clients of Pertamina Patra Niaga. This relatively small sample size limits the generalizability of the findings to other sectors or larger populations. The specific context of a state-owned enterprise within the petrochemical industry may not reflect the broader dynamics of other industries or private sector companies.

(2) The research is context-specific, focusing on the petrochemical sector. The unique characteristics of this context, including the regulatory environment, market dynamics, and the strategic importance of energy provision, may limit the applicability of the findings to other industries or regions. Different industries may have distinct factors influencing sustainable customer loyalty, necessitating tailored approaches. Therefore, future studies should explore similar variables in different sectors to understand industry-specific nuances.

Building on these findings, several future research directions are proposed to further advance the understanding of sustainable customer loyalty dynamics. Future research should expand the research to different industries and geographic regions, which will enhance the generalizability of findings. Comparative studies across sectors can identify industry-specific factors influencing sustainable customer loyalty, providing a broader perspective.

Incorporating objective data and multiple sources, such as customer transaction data, service usage statistics, and independent satisfaction ratings, will also offer a more accurate view of the factors influencing sustainable customer loyalty and minimize biases from self-reported data. Exploring additional variables like digital transformation, corporate social responsibility, and customer experience management can provide a holistic understanding of sustainable customer loyalty, reflecting their increasing relevance in today's business environment.

8. Conclusions

This study comprehensively analyzes the factors influencing corporate sustainable customer loyalty in the petrochemical industry, focusing on service innovation, product quality, and corporate image, with customer satisfaction as a mediating variable. Several key conclusions can be drawn from the findings. Product quality emerges as a critical determinant of both customer satisfaction and loyalty. High-quality products meet or exceed customer expectations, fostering trust and long-term satisfaction. In the context of the petrochemical industry, where operational excellence and reliability are paramount, maintaining high standards of product quality is essential for sustaining customer relationships and mitigating the impacts of market and regulatory fluctuations.

The study reveals that service innovation, while not directly influencing immediate customer satisfaction, significantly impacts sustainable customer loyalty. This suggests that customers value continuous improvements in service as a basis for long-term engagement rather than immediate gratification. In the competitive petrochemical industry, leveraging technological advancements and innovative service delivery can define market leadership and provide a competitive edge. A positive corporate image significantly enhances sustainable customer loyalty, underscoring the importance of maintaining a strong and consistent corporate reputation. Corporate image plays a crucial role in loyalty, possibly due to the company's pivotal role in national energy security and its visibility in public and governmental sectors. Enhancing corporate image through transparent communication, ethical practices, and community engagement can strengthen sustainable customer loyalty.

Author Contributions: O.K.: Conceptualization, methodology, software, validation, formal analysis, investigation, resources, data curation, writing—original draft preparation, writing—review and editing, visualization, supervision, project administration, funding acquisition. K.H.: validation, formal analysis, investigation, resources, data curation, writing—original draft preparation, writing—review and editing, visualization, supervision, project administration. B.H.: formal analysis, investigation, resources, data curation, writing—original draft preparation, writing—review and editing, visualization, supervision, project administration. S.: data curation, writing—original draft preparation, writing—review and editing, visualization, supervision, project administration. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: The study was conducted in accordance with the research protocol, and approved by the Institutional Review Board (or Ethics Committee) of Faculty of Administrative Science, Brawijaya University (01104/UN10.F0301/B/PP/2024 and 27 June 2024).

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The data are available from the authors upon request.

Conflicts of Interest: The authors declare no conflicts of interest.

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