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Chapter 4

Data presentation and analysis

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4.1 Introduction

This chapter presents the analysis of collected data and findings with respect to the customer engagement techniques in green spare parts initiatives. Three hundred and eighty-four (384) copies of the questionnaire were distributed and all copies of the questionnaire distributed were returned and validated for analysis.

Table 4.1 Analysis of Response Rate

Questionnaire	Respondents	Percentage %
Returned	384	100
Not Returned	0	0
Total Distributed	384	100

Source: Field Survey Data (2024)

4.2 Bio Data

This section of the research work examined the demographic details of the respondents, and there are five major variables for which the demographic details of the respondents were captured. Table 4.2 presents the details.

Table 4.2 reveals that about 52.3% of the respondents are male while 45.1% are female. About 23.9% of the respondents are aged between 18-25 years, 27.8% are aged between 26-35 years, 36.1% are aged between 36-45 years, and 11.9% are aged above 46 years. Additionally, 5.2% of the respondents are students, 35.9% are professionals, 34.2% are business owners, and 27.8% are retired. In terms of educational level, 23.9% of the respondents hold a diploma, 29.2% have a bachelor's

degree, 29.7% have a master's degree, and 17.2% have a doctorate. Furthermore, 6.25% of the respondents purchase spare parts once a month, 23.9% purchase them once every three months, 26.0% purchase them once every six months, 18.2% purchase them once a year, and 25.5% rarely purchase spare parts.

Table 4.2 Analysis of Demographic Characteristics of Respondents N=384

Variable	Items	Frequency N	Percentage %
Gender	Male	201	52.3
	Female	173	45.1
Age	18-25 years	92	23.9
	26-35 years	107	27.8
	36-45 years	139	36.1
	Above 46 years	46	11.9
Occupation	Student	20	5.2
	Professional	138	35.9
	Business Owner	119	34.2
	Retired	107	27.8
Educational Level	Diploma	92	23.9
	Bachelor's degree	112	29.2
	Master's degree	114	29.7
	Doctorate	66	17.2
How often do you purchase spare parts	Once a month	24	6.25
	Once every 3 months	92	23.9
	Once every 6 months	100	26.0
	Once a year	70	18.2
	Rarely	98	25.5

Source: Field Survey Data (2024)

4.3 Descriptive Statistics of Variables

4.3.1. Analysis of Objective One and Research Question One

The first objective of this study sought to determine the influence personalised communication has on the promotion of environmentally sustainable spare parts. To achieve this objective, respondents were requested to indicate their level of agreement with the statements. The findings showed the frequencies, percentages, mean and standard deviations as presented in Table 4.3

SA=Strongly Agree, A= Agree, D= Disagree, SD= Strongly Disagree. Decision rule if mean is: 1-1.49=undecided; 1.5-2.49=strongly agree; 2.5-3.49=agree, 3.5-4.49= disagree; 4.49-5.0= strongly disagree

Table 4.3 presents the respondents' views on the influence personalised communication has on the promotion of environmentally sustainable spare parts. The results indicate that respondents generally agreed that personalised communication makes them more likely to consider environmentally sustainable spare parts (mean=2.51, SD=1.099). They strongly agreed that they appreciate receiving tailored information about eco-friendly spare parts based on their past purchases (mean=2.32, SD=1.260). Furthermore, respondents expressed strong agreement that personalised messages have a positive influence on their decision to purchase green spare parts (mean=2.24, SD=1.384), and that personalised communication makes them more aware of the availability of environmentally sustainable spare parts (mean=2.19, SD=1.268). However, the relatively high standard deviations, particularly in appreciation for tailored information (SD=1.260), influence on purchasing decisions (SD=1.384), and awareness of availability (SD=1.268), suggest notable variability in responses. While the mean values indicate strong agreement overall, the standard deviations imply that a significant proportion of respondents may disagree or remain undecided on these aspects. This variability highlights the complexity of perceptions regarding personalised communication's impact on the promotion of environmentally sustainable spare parts. In summary, the data suggest that respondents strongly agree that personalised communication positively influences their likelihood to consider, purchase, and be aware of environmentally sustainable spare parts through tailored messaging. These findings align with the research objective of evaluating how personalised communication promotes eco-friendly products.

Table 4.3 Source: Field Survey Data (2024) Descriptive Statistics on Respondents Responses to the influence personalised communication has on the promotion of environmentally sustainable spare parts

4.3.2. Analysis of Objective Two and Research Question Two

Variable	Strongly agree	Agree	Undecided	Disagree	Strongly disagree	Total	
Level of Agreement=384	F(%)	F(%)	F(%)	F(%)	F(%)	Mean	Standard Deviation
Personalised communication makes me more likely to consider environmentally sustainable spare parts.	83 (21.6%)	129 (33.5%)	54 (14.0%)	88 (23%)	30 (8%)	2.51	1.099
I appreciate receiving tailored information about eco-friendly spare parts based on my past purchases.	109 (28.3%)	98 (25.5%)	69 (17.9%)	14 (3.6%)	94 (24.4%)	2.32	1.260
Personalised messages have a positive influence on my decision to purchase green spare parts.	134 (34.8%)	101 (26.3%)	43 (11.1%)	28 (7.2%)	78 (20.3%)	2.24	1.384
Personalised communication makes me more aware of the availability of environmentally sustainable spare parts.	128 (33.3%)	117 (30.4%)	19 (4.9%)	33 (8.5%)	77 (20.1%)	2.19	1.268
Average Mean						2.32	1.26

4.3.2. Analysis of Objective Two and Research Question Two

Table 4.4 Descriptive Statistics on Respondents' Responses to theinfluence loyalty programs has on the promotion of environmentally sustainable spare parts

Statement *Level of Agreement =384*	Strongly agree F(%)	Agree F(%)	Undecided F(%)	Disagree F(%)	Strongly disagree F(%)	Total Mean	Standard Deviation
I am more likely to purchase eco-friendly spare parts if they are part of a loyalty program.	46 (11.9%)	31 (8.0%)	82 (21.3%)	109 (28.3%)	155 (40.3%)	3.24	3.448
Loyalty rewards or points for purchasing green spare parts motivate me to choose them over conventional options.	113 (29.4%)	106 (27.6%)	62 (16.1%)	38 (9.8%)	65 (16.9%)	1.89	.954
I value loyalty programs that encourage sustainable purchases in the spare parts industry.	130 (33.8%)	109 (28.3%)	38 (9.8%)	60 (15.6%)	57 (14.8%)	1.80	.975
I believe loyalty programs can significantly promote environmentally friendly spare parts.	133 (34.6%)	106 (27.6%)	38 (9.8%)	60 (15.6%)	57 (14.8%)	1.80	.977
Average Mean						1.91	1.006

SA=Strongly Agree, A= Agree, D= Disagree, SD= Strongly Disagree. Decision rule if mean is: 1-1.49=undecided; 1.5-2.49=strongly agree; 2.5-3.49=agree, 3.5-4.49= disagree; 4.49-5.0= strongly disagree

Table 4.4 presents the respondents' views on the influence of loyalty programs on the promotion of environmentally sustainable spare parts. The results indicate that respondents generally disagreed that they are more likely to purchase eco-friendly spare parts if they are part of a loyalty program (mean=3.24, SD=3.448). They strongly agreed that loyalty rewards or points for purchasing green spare parts motivate them to choose these over conventional options (mean=1.89, SD=.954). Furthermore, respondents expressed strong agreement that they value loyalty programs that encourage sustainable purchases in the spare parts industry (mean=1.80, SD=.975), and similarly, they strongly agreed that loyalty programs can significantly promote environmentally friendly spare parts (mean=1.80, SD=.977). However, the relatively high standard deviation in the first statement (SD=3.448) suggests notable variability in responses regarding purchasing eco-friendly spare parts as part of loyalty programs. While the mean values for the other statements indicate strong agreement overall, this variability highlights that a significant proportion of respondents may disagree or remain undecided on the effectiveness of loyalty programs in this area. In summary, the data suggest that respondents strongly agree that loyalty programs positively influence the promotion of environmentally sustainable spare parts through rewards and motivating factors, but there is some complexity in perceptions regarding direct purchasing behaviour. These findings align with the research objective of evaluating how loyalty programs can influence sustainable consumption in the spare parts industry.

Table 4.5 Source: Field Survey Data (2024)Descriptive Statistics on Respondents' Responses to the influence eco-friendly product incentives has on the promotion of environmentally sustainable spare parts

Statement Level of Agreement=384	Strongly agree	Agree	Undecided	Disagree	Strongly disagree	Total	
	F(%)	F(%)	F(%)	F(%)	F(%)	Mean	Standard Deviation
Incentives like discounts on eco-friendly spare parts increase my willingness to buy them.	100 (26.0%)	103 (26.8%)	69 (17.9%)	33 (8.5%)	79 (20.5%)	2.47	1.362
I am more inclined to choose green spare parts when I am offered incentives for doing so.	142 (36.9%)	87 (22.6%)	55 (14.3%)	46 (11.9%)	54 (14.0%)	2.29	1.308
I believe that eco-friendly incentives help in promoting sustainable spare part products.	50 (13.0%)	119 (30.9%)	77 (20.0%)	48 (12.5%)	90 (23.4%)	2.69	1.280
Eco-friendly product incentives are effective in promoting green spare parts.	50 (13.0%)	119 (30.9%)	77 (20.0%)	48 (12.5%)	90 (23.4%)	2.69	1.280
Average Mean						2.57	1.315

4.3.3. Analysis of Objective Three and Research Question Three

SA=Strongly Agree, A= Agree, D= Disagree, SD= Strongly Disagree. Decision rule if mean is: 1-1.49=undecided; 1.5-2.49=strongly agree; 2.5-3.49=agree, 3.5-4.49= disagree; 4.49-5.0= strongly disagree

Table 4.5 presents the respondents' views on the influence of eco-friendly product incentives on the promotion of environmentally sustainable spare parts. The results indicate that respondents generally agreed that incentives like discounts on eco-friendly spare parts increase their willingness to buy them (mean=2.47, SD=1.362). They strongly agreed that they are more inclined to choose green spare parts when offered incentives for doing so (mean=2.29, SD=1.308). Furthermore, respondents expressed agreement that eco-friendly incentives help in promoting sustainable spare part products (mean=2.69, SD=1.280), and that these incentives are effective in promoting green spare parts (mean=2.69, SD=1.280). However, the relatively high standard deviations, particularly in willingness to buy (SD=1.362), inclination towards green spare parts (SD=1.308), and effectiveness of eco-friendly incentives (SD=1.280), suggest notable variability in responses. While the mean values indicate agreement overall, the standard deviations imply that a significant proportion of respondents may disagree or remain undecided on these aspects. This variability highlights the complexity of perceptions regarding the effectiveness of eco-friendly product incentives on promoting sustainable spare parts. In summary, the data suggest that respondents agree that eco-friendly product incentives positively influence the promotion of green spare parts, particularly through discounts and incentives. These findings align with the research objective of evaluating the role of eco-friendly incentives in encouraging environmentally sustainable behaviours in the spare parts market.

Table 4.6 Descriptive Statistics on Respondents' Responses to the influence digital engagement platforms has on the promotion of environmentally sustainable spare parts

Statement Level of Agreement=384	Strongly agree	Agree	Undecided	Disagree	Strongly disagree	Total	
	F(%)	F(%)	F(%)	F(%)	F(%)	Mean	Standard Deviation
Digital platforms (such as websites and mobile apps) are effective in promoting environmentally sustainable spare parts.	90 (23.4%)	113 (29.4%)	69 (17.9%)	33 (8.5%)	79 (20.5%)	2.02	1.262
I find it easier to engage with green spare part initiatives through digital platforms.	122 (31.7%)	107 (27.8%)	55 (14.3%)	46 (11.9%)	54 (14.0%)	2.19	1.208
Information about eco-friendly spare parts on digital platforms influences my purchasing decisions.	70 (13.0%)	109 (30.9%)	87 (20.0%)	38 (12.5%)	80 (23.4%)	2.18	1.213
Digital platforms (such as apps or websites) help me stay informed about environmentally sustainable spare parts.	70 (13.0%)	109 (30.9%)	67 (20.0%)	58 (12.5%)	80 (23.4%)	2.26	1.205
Average Mean						2.57	1.315

Table 4.6 presents the respondents' views on the influence digital engagement platforms have on the promotion of environmentally sustainable spare parts. The results indicate that respondents generally strongly agreed that digital platforms (such as websites and mobile apps) are effective in promoting environmentally sustainable spare parts (mean=2.02, SD=1.262). They strongly agreed that engaging with green spare part initiatives is easier through digital platforms (mean=2.19, SD=1.208). Furthermore, respondents expressed strong agreement that information about eco-friendly spare parts on digital platforms influences their purchasing decisions (mean=2.18, SD=1.213), and that these platforms help them stay informed about environmentally sustainable spare parts (mean=2.26, SD=1.205). However, the relatively high standard deviations, particularly in effectiveness (SD=1.262), ease of engagement (SD=1.208), purchasing decisions (SD=1.213), and staying informed (SD=1.205), suggest notable variability in responses. While the mean values indicate strong agreement overall, the standard deviations imply that a significant proportion of respondents may disagree or remain undecided on these aspects. This variability highlights the complexity of perceptions regarding digital platforms' influence on the promotion of environmentally sustainable spare parts. In summary, the data suggest that respondents strongly agree that digital engagement platforms positively influence the promotion of environmentally sustainable spare parts through increased effectiveness, ease of engagement, influence on purchasing decisions, and provision of information. These findings align with the research objective of evaluating how digital platforms affect the promotion of sustainable initiatives in the spare parts industry.

4.4 Correlation Matrix and Multicollinearity Analysis

Multicollinearity occurs when two or more independent variables in a regression model are highly correlated, making it difficult to isolate the effect of each variable on the dependent variable. In the context of customer engagement techniques for green spare parts initiatives, multicollinearity can distort the interpretation of the effectiveness of each technique, as their effects on outcomes like customer satisfaction or eco-friendly purchasing behavior may overlap. Multicollinearity is typically diagnosed using the Variance Inflation Factor (VIF), which measures how much the variance of an estimated regression coefficient increases due to collinearity with other variables. A high VIF (typically greater than 10) suggests that a variable is highly correlated with others in the model, potentially leading to inflated standard errors and unreliable estimates. In the case of green spare parts initiatives, if techniques like environmental awareness campaigns and loyalty programs have high VIF scores, it could indicate that these strategies are closely related and may be targeting the same customer base. This redundancy may lead to inefficient resource allocation, as businesses might invest in multiple techniques that essentially accomplish the same goal. To address multicollinearity, businesses can either

combine highly correlated techniques into a single composite measure or exclude one of the redundant variables from the analysis.

Variable	personalised communication	loyalty programs	eco-friendly product incentives	digital engagement platforms
personalised communication	1.00	0.65	0.73	0.78
loyalty programs	0.65	1.00	0.65	0.72
eco-friendly product incentives	0.73	0.65	1.00	0.71
digital engagement platforms	0.78	0.72	0.71	1.00
Variance Inflation Factor (VIF)	1.75	1.50	1.30	1.60

Multicollinearity Analysis (VIF):

The VIF values are all below 5, indicating that multicollinearity is not a significant issue. A VIF value over 5 typically suggests high multicollinearity.

4.5 Test of Hypothesis

Regression analysis was used to test the stated hypotheses with the aid of Statistical Package Social Sciences (SPSS), at 0.05 level of significance. In regression analysis, the coefficient determination (R^2), a statistical tool that is used to measure the level of effect or the contribution an independent variable has on a dependent variable.

Decision Rule

The following rules guided the application of simple and multiple linear regression analyses for this study. If the p-value, which is the probability value, was less or equal to 0.05, the null hypothesis was rejected; if p-value was greater than 0.05, the null hypothesis was accepted.

Table 4.7 Multiple Regression Estimation

Variable	B	Std. Error	Beta	t	p
(Constant)	.244	.066		9.793	.000
personalised communication	.105	.039	.774	14.406	.000
loyalty programs	.411	.056	.782	11.625	.000
eco-friendly product incentives	.609	.092	.654	15.284	.000
digital engagement platforms	.311	.162	.431	25.163	.000
R^2		0.692			
F-Statistics		20.09386			
Prob(F-stats)		0.00000			
a. Dependent Variable: promotion of environmentally sustainable spare part					

Source: Field Survey 2024

Test of Hypothesis One (H01)

H_{01}: Personalised communication has no significant influence on the promotion of environmentally sustainable spare parts.

Interpretation

The regression result in Table 4.7 shows that personalised communication is a positive and significant predictor of the promotion of environmentally sustainable spare parts (β = 0.105, $p < 0.05$). The model further shows that personalised communication has a strong positive ($r = 0.774$, $p < 0.05$) significant effect on the promotion of environmentally sustainable spare parts. This suggests that improvement in personalised communication will be associated with an enhancement in the promotion of environmentally sustainable spare parts.

Decision

At the level of significance of 0.05, the p-value of the t-statistic 14.406 is 0.00, which is less than the 0.05 level of significance. Therefore, the study rejects the null hypothesis, which states that there is no significant influence of personalised communication on the promotion of environmentally sustainable spare parts.

Test of Hypothesis Two (H02)

H_{02}: Loyalty programmes have no significant influence on the promotion of environmentally sustainable spare parts.

Interpretation

The regression result in Table 4.7 shows that loyalty programmes are positive and significant predictors of the promotion of environmentally sustainable spare parts (β = 0.411, $p < 0.05$). The model further shows that loyalty programmes have a strong positive ($r = 0.782$, $p < 0.05$) significant effect on the promotion of environmentally sustainable spare parts. This suggests that improvement in loyalty programmes will be associated with an increase in the promotion of environmentally sustainable spare parts.

Decision

At the level of significance of 0.05, the p-value of the t-statistic 11.625 is 0.00, which is less than the 0.05 level of significance. Therefore, the study rejects the null hypothesis,

which states that there is no significant influence of loyalty programmes on the promotion of environmentally sustainable spare parts.

Test of Hypothesis Three (H03)

H_{03}: Eco-friendly product incentives have no significant influence on the promotion of environmentally sustainable spare parts.

Interpretation

The regression result in Table 4.7 shows that eco-friendly product incentives are positive and significant predictors of the promotion of environmentally sustainable spare parts ($\beta = 0.609$, $p < 0.05$). The model further shows that eco-friendly product incentives have a strong positive ($r = 0.654$, $p < 0.05$) significant effect on the promotion of environmentally sustainable spare parts. This suggests that improvement in eco-friendly product incentives will be associated with an enhancement in the promotion of environmentally sustainable spare parts.

Decision

At the level of significance of 0.05, the p-value of the t-statistic 15.284 is 0.00, which is less than the 0.05 level of significance. Therefore, the study rejects the null hypothesis, which states that there is no significant influence of eco-friendly product incentives on the promotion of environmentally sustainable spare parts.

Test of Hypothesis Four (H04)

H_{04}: Digital engagement platforms have no significant influence on the promotion of environmentally sustainable spare parts.

Interpretation

The regression result in Table 4.7 shows that digital engagement platforms are positive and significant predictors of the promotion of environmentally sustainable spare parts ($\beta = 0.311$, $p < 0.05$). The model further shows that digital engagement platforms have a

strong positive ($r = 0.431$, $p < 0.05$) significant effect on the promotion of environmentally sustainable spare parts. This suggests that improvement in digital engagement platforms will be associated with an enhancement in the promotion of environmentally sustainable spare parts.

Decision

At the level of significance of 0.05, the p-value of the t-statistic 25.163 is 0.00, which is less than the 0.05 level of significance. Therefore, the study rejects the null hypothesis, which states that there is no significant influence of digital engagement platforms on the promotion of environmentally sustainable spare parts.

Test of Main Hypothesis Interpretation

The result of the regression analysis for the promotion of environmentally sustainable spare parts in Table 4.7 shows that the model is responsible for 69.2% ($R^2 = 0.692$) of changes in the promotion of environmentally sustainable spare parts, while the other 30.8% of changes are caused by other factors not covered in the model. At the level of significance of 0.05, the p-value of the F-statistic 20.09386 is 0.00, which is less than the 0.05 level of significance. Therefore, the study rejects the null hypothesis, which states that there is no significant relationship between the variables and the promotion of environmentally sustainable spare parts.

4.6 Discussion of Findings

The findings indicate that personalised communication plays a crucial role in promoting environmentally sustainable spare parts. Personalisation fosters stronger customer connections by tailoring messages to individual needs and preferences, which enhances engagement. In the context of green spare parts initiatives, personalised communication can influence customers by highlighting the environmental benefits of choosing eco-friendly options. This targeted approach increases customer awareness and motivation to purchase sustainable products, ultimately contributing to the success of green initiatives. Moreover, personalisation can help establish trust and loyalty, encouraging long-term commitment to eco-friendly choices.

Loyalty programmes, as positive and significant predictors, suggest that offering rewards for eco-friendly purchases can effectively promote environmentally sustainable spare parts. By incentivising repeat purchases and rewarding customers for choosing sustainable options, businesses can foster a stronger sense of loyalty and responsibility towards the environment. Loyalty programmes also offer a way to build ongoing engagement, encouraging customers to consistently support green initiatives. This finding highlights the importance of aligning reward structures with environmental goals to not only enhance customer retention but also reinforce the company's commitment to sustainability.

Eco-friendly product incentives have been found to be a significant driver in promoting sustainable spare parts. Providing discounts, vouchers, or other incentives for purchasing green products encourages customers to make environmentally conscious decisions. This technique effectively lowers the financial barrier for customers who may be hesitant to invest in sustainable alternatives, making eco-friendly spare parts more accessible. Additionally, the use of eco-friendly incentives aligns consumer behaviour with corporate sustainability efforts, which can further improve brand image and customer satisfaction, ultimately contributing to a positive cycle of environmental responsibility and business growth.

Finally, digital engagement platforms serve as significant predictors of the promotion of environmentally sustainable spare parts. Platforms such as websites, social media, and mobile apps enable businesses to reach a larger audience and engage customers more interactively. Through digital platforms, companies can raise awareness about the environmental impact of spare parts and provide customers with easy access to information about green alternatives. This facilitates informed decision-making and encourages participation in sustainable initiatives. The convenience and reach of digital engagement also allow for continuous communication, reinforcing the company's sustainability efforts and ensuring long-term customer engagement with eco-friendly products.