

*Full Length Research Paper*

# Product development and organizational performance

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**Product development is an important element of the marketing arsenal of any organization. Unfortunately many firms do not seem to realize it. Consequently, they develop strong arteries to innovation which rubs their performance really rough. This study, therefore, examined product development and corporate performance in the Nigerian brewing industry. Data were gathered from 32 officials drawn from marketing, R&D and production departments in four breweries in the south-south and south east geographical regions of Nigeria through the use of questionnaire. The data were analyzed using appropriate statistical tool (spearman rank order correlation co-efficient). The data revealed among other things that product development facets of product quality and product lines/product mix were positively and significantly correlated with the corporate performance facets of profitability, sales volume and customer loyalty. The study also revealed that the relationship between product size, product design and profitability, sales volume and customer loyalty was not significant. The study concludes that a positive and significant relationship exists between product quality product lines/product mix and profitability, sales volume and customer loyalty. To this end, it was recommended among other things that high product quality should be maintained and that the breweries should continuously develop new market segments and develop appropriate product accordingly.**

**Key words:** Product, development, organization, performance, Nigeria.

## INTRODUCTION

From the marketing standpoint, the socio-economic justification for the existence of any business organization is the satisfaction of customers' needs and wants. The organizational survival over-time depends on its ability to create loyal customers because its products match the needs of the buyers. Thus, the organization meets its basic responsibility to the society through its product offerings. For a firm to compete effectively in the dynamic and competitive business environment and achieve set goals in terms of profitability, high sales volume, and large market share, it must continuously develop products and product lines to satisfy the constantly changing desires and needs of customers (Grundiche, 2004:168). These Organizational adjustments in response to new customer preferences even make it necessary to modify

existing products, introduce new ones or eliminate products that are unsuccessful. Product development is a broad field of endeavour dealing with design, creation and marketing of new product, (Yanelle, 2005:92).

It encompasses product planning as well the technical activities of product research, engineering design, etc to take advantage of potential opportunities facing a company's product idea in a market. Product development is very critical to organizational performance because the product is the cornerstone of the firm's marketing mix: every other element rests on the product. Product is not used to mean only tangible 'things', but includes services (the intangibles) as well as things that can be touched and seen and tasted. This explains why Kotler (1994:434) sees it as a bundle of physical, service, and symbolic particulars expected to yield satisfaction or benefits to the buyer.

Since the purpose of product development is to provide satisfaction for customers and to face competitive threat, every marketing organization such as the breweries is in a

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highly dynamic situation. This is because customers' needs are constantly changing. Their incomes, lifestyles, level of education, sophistication and technology are dynamic and not static. Therefore, their marketing policies have been dynamic, not static, and the products offered to the market have come constantly under review and frequent changes. Market analysis has shown that many breweries in Nigeria have introduced many innovations in their product development strategy (Etuk, 2003:88). Products are packaged in big and small bottles, cans with many lines and depth.

A close observation of the Nigerian beer industry shows that the post mergers acquisition era in the sector has witnessed phenomenal growth as typified by the performance of big breweries such as Guinness, Nigerian breweries and consolidated breweries Plc made possible by product development (Ojo, 2000:92). However, other breweries have not been able to operate optimally. This, therefore, suggests that organizational performance, which refers to how well an organization is doing in relation to intended purpose and competition, might depend to a large extent on product development. But this has not yet been ascertained, as the situation in the Nigerian beer industry appears not to have stimulated interest among researchers and academics in the Nigerian intelligentsia. This might have been informed in part by the apathy, levity and jaundiced perception with which many scholars treat the beer industry in Nigeria. Undeniably, the industry has made meaningful contributions to our gross domestic product (GDP), employment generation, sport sponsorship and promotion of Nigerian music and artistes (Mousend and Thompson, 2002:283).

In the light of the achievement of few breweries and the dismal performance of others which are still struggling to find their feet and rhythm in the Nigerian business environment turbo-charged by competition, volatility and unpredictability, it is necessary to direct empirical search light on this Industry, which can provide information on product development and organization performance in the sector, thereby enriching existing literature. In Nigeria, apart from the perceived high performance recorded by the Nigerian breweries Plc and Guinness Nig. Plc, other breweries have not been able to operate profitably, example, Pabod breweries, which has been reactivated recently.

This tends to imply that the successful breweries might have used effective product development strategy to achieve corporate goals and objectives. It equally implies that product failure in other breweries might have been informed by ineffective product development. However, these beliefs, hunches and conjectures have not been clearly substantiated by a concerted empirical effort, thus creating a yawning gap in existing literature which needs to be bridged.

In the light of the above, this study is undertaken to examine the probable link between product development and organizational performance in the Nigerian breweries industry, drawing our empirical analysis from breweries in the South-Eastern states of Nigeria.

We therefore hypothesize thus:

H0<sub>1</sub>: There is no significant relationship between product quality and profitability in the beer industry.

H0<sub>2</sub>: There is no significant relationship between product quality and sales volume in the breweries.

H0<sub>3</sub>: There is no significant relationship between product quality and customer loyalty.

H0<sub>4</sub>: There is no significant relationship between product size and profitability in the breweries in Nigeria.

H0<sub>5</sub>: There is no significant relationship between product size and sales volume.

H0<sub>6</sub>: There is no significant relationship between product size and customer loyalty in the Nigerian beer industry.

H0<sub>7</sub>: There is no significant relationship between product lines and profitability in the breweries.

H0<sub>8</sub>: There is no significant relationship between product lines and sales volume in the beer industry.

H0<sub>9</sub>: There is no significant relationship between product lines and customer loyalty in the breweries.

H0<sub>10</sub>: There is no significant relationship between product design and Profitability in the breweries.

H0<sub>11</sub>: There is no significant relationship between product design and sales volume in the beer industry.

H0<sub>12</sub>: There is no significant relationship between product design and customer loyalty in the beer industry.

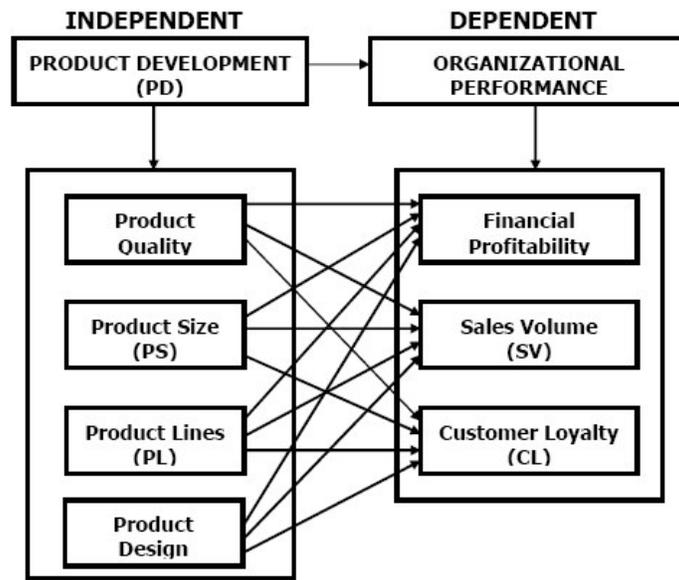
## THE EMPIRICAL STUDY

This correlational study adopted the survey method of the quasi experimental research design of a cross section of all top marketing and management executives in the Nigerian brewery industry in the collection and analysis of data. This design was appropriate because the researcher wished to examine the product development and organizational performance situation in more than one brewery. The target population for this study consisted of all the breweries in Nigeria. However, the accessible population was made up of the breweries in the South-East and South-South states of Nigeria. The choice of the two geopolitical zones was informed by the presence of some breweries which could provide the much needed data for the study.

The simple sampling method was used to select the sample element from the accessible population. Thus, all the top marketing and management executives associated with product development were sampled. In all, a total of 39 officials in such units as marketing, sales, public affairs, production and top management were selected. From the above, it is clear that the sample size of this study consisted of the five (5) breweries located in the south-east and south-south regions of Nigeria.

## CONCEPTUAL FRAMEWORK

The major variables of this study were product development (independent variable) and organizational performance (dependent variable) Figure 1. Product development is denoted by (PD) while Organizational Performance is symbolized by (OP). The focus of this study was Nigerian Beer Industry which in recent years has been characterized by many innovative products in the forms of design and sizes. Thus, the researcher operationalized product development in terms of product quality, product design, product lines and product size. It should be emphasized at this juncture that there are other



**Figure 1.** The Relationship between Product Development and Organizational Performance.

criteria or variables that may be used to measure product development. Since the focus is the beer industry, the researcher limited himself to the afore-mentioned criteria. Organizational Performance in this study is measured in terms of financial profitability, sales volume and customer loyalty. The link between product development (PD) and Organizational Performance (OP) is illustrated in the diagram below.

**FINDINGS**

**Test of hypotheses**

Ho<sub>1</sub>: There is no significant relationship between product quality and profitability in the brewing industry in Nigeria.

$$r_s = 1 - \frac{6\sum d^2}{n(n^2 - 1)} = 1 - \frac{6 \times 2.940}{32(32^2 - 1)} = 0.539$$

rs = 0.530 (This implies that is a perfect correlation between X and Y variables).

To test for the significance of relationship for a large sample and a two tailed test, z- test was used

$$Z = r_s \sqrt{n-1}$$

Where:

rs = spearman rank correlation co-efficient.

n = number of subjects ranked.

$$Z = 0.539 \sqrt{32-1} = 0.539 \times 5.57 = 3.00$$

$$Z_{cal} = 3.00$$

$$Z_{tab, 0.05} = \pm 1.96$$

Decision: We reject the null hypothesis since zcal = 3.00 > ±1.96 (the critical value) and conclude that there is a positive and significant relationship between product quality and profitability in the breweries.

Ho<sub>2</sub>: There is no significant relationship between product quality and sales volume in the breweries.

$$r_s = 1 - \frac{6\sum d^2}{n(n^2 - 1)} = 1 - \frac{6 \times 2.826}{32(32^2 - 1)} = 1 - \frac{16956}{32736} = 0.518$$

rs = 0.518 (This suggest that a correlation exists between the two variables).

To test for the significance of the relationship between x and y variables for a large sample Z-test were used:

$$Z = r_s \sqrt{n-1} = 0.518 \sqrt{32-1} = 0.518 \times 5.57 = Z_{cal} = 2.886.$$

$$Z_{tab, 0.05} = \pm 1.96$$

Decision rule: We reject the null hypothesis (Ho<sub>2</sub>) since Zcal = 2.886 > ±1.96 (Z critical value) and conclude that a significant relationship exists between product quality and sales volume in the brewing industry.

Ho<sub>3</sub>: There is no significant relationship between Product Quality and Customer loyalty in the Nigerian Brewing industry.

$$r_s = 1 - \frac{6\sum d^2}{n(n^2-1)} = 1 - \frac{6 \times 2932}{32(32^2-1)} = 1 - \frac{17592}{32736} = 0.537$$

$r_s = 0.537$  (This implies that the sample correlation is good).

To test for the significance of the relationship between product quality and sales volume, we applied

$$Z = r_s \sqrt{n-1}$$

$$Z = 0.537 \sqrt{32-1} = 0.537 \times 5.57 = 2.99$$

$$Z_{cal} = 2.99$$

$$Z_{tab, 0.05} = \pm 1.96$$

Decision rule: We reject the null hypothesis ( $H_{o3}$ ) since  $Z_{cal} = 2.99 > \pm 1.96$  (critical value) and conclude that there is a significant relationship between product quality and customer loyalty in the brewing industry in Nigeria.

$H_{o4}$ : There is no significant relationship between product size and profitability in the brewing industry in Nigeria.

$$r_s = 1 - \frac{6\sum d^2}{n(n^2-1)} = 1 - \frac{6 \times 3540}{32(32^2-1)} = 1 - \frac{21240}{32736} = 0.351$$

$r_s = 0.351$  (This implies a weak correlation between the x and y variables).

To test for the significance of the relationship for a large sample and a two tailed test, Z-test was used:

$$Z = r_s \sqrt{n-1} = 0.351 \sqrt{32-1} = 0.351 \times 5.57$$

$$Z_{cal} = 1.955$$

$$Z_{tab, 0.05} = \pm 1.96$$

Decision rule: We accept the null hypothesis ( $H_{o4}$ ) since the calculated value  $Z = 1.955 < 1.96$  (the critical value) and therefore conclude that the correlation between product size and profitability is not significant.

$H_{o5}$ :- There is no significant relationship between product size and sales volume in the brewing industry.

$$r_s = \frac{1 - 6\sum d^2}{n(n^2-1)}$$

$$= \frac{1 - 6 \times 14}{210} = 0.6$$

$r_s$  co-efficient = 0.6 (This implies good relationship between the two variables).

To test the significance of the relationship, Z-test was

used:

$$Z = r_s \sqrt{n-1} = 0.6 \sqrt{6-1} = 0.6 \sqrt{5} = 0.6 \times 2.24$$

$$Z_{cal} = 1.34$$

$$Z_{tab, 0.05} = \pm 1.96$$

Decision: We accept  $H_o$  since the calculated value of  $Z$   $1.34 < 1.96$  critical value of  $Z$  at 0.05 level of significance and conclude that the relationship between product size and sales volume is not significant in the Nigerian brewing industry.

$H_{o6}$ : There is no significant relationship between product size and customer loyalty in the brewing industry in Nigeria.

$$r_s = \frac{1 - 6\sum d^2}{n(n^2-1)}$$

$$= \frac{1 - 6 \times 8}{210} \left. \right\} = 0.77$$

$r_s$  co-efficient = 0.77 (This implies good correlation between the two variables).

To test for the significance of the relationship for a two tailed test, Z-test was applied:

$$Z = r_s \sqrt{n-1} = 0.77 \sqrt{6-1} = 0.77 \sqrt{5}$$

$$Z = 0.77 \times 2.24 = 1.72$$

$$Z_{cal} = 1.72$$

$$Z_{tab, 0.05} = \pm 1.96$$

Decision: We accept the null hypothesis ( $H_{o6}$ ) since the computed value of  $Z = 1.72 < \pm 1.96$  at 0.05 level of significance, and conclude that the relationship between product size (PS) and customer loyalty (CL) is not significant in the Nigerian brewing industry.

$H_{o7}$ : There is no significant relationship between product lines and profitability in the breweries.

$$r_s = 1 - \frac{6\sum d^2}{n(n^2-1)} = 1 - \frac{6 \times 2998}{32(32^2-1)} = 1 - \frac{17988}{32736} = 0.549$$

$r_s$  co-efficient = 0.549 (This implies an appreciable correlation between the x and y variables).

For the test for significance of the relationship between the independent and dependent variables, we used z-test.

$$Z = r_s \sqrt{n-1} = 0.549 \sqrt{32-1} = 0.549 \sqrt{31}$$

$$Z = 0.549 \times 5.57 = 3.06$$

$$Z_{cal} = 3.06$$

$$Z_{tab, 0.05} = \pm 1.96$$

Decision rule: We reject the null hypothesis ( $H_{07}$ ) since  $Z_{cal} = 3.06 > \pm 1.96$  and conclude that there is a positive and significant relationship between product lines and profitability in the brewing industry in Nigeria.

$H_{08}$ : There is no significant relationship between product lines and sales volume in the breweries.

$$r_s = 1 - \frac{6 \times 2}{6(6^2 - 1)} = \frac{1 - 12}{210} = 0.94$$

$$r_s \text{ co-efficient} = 0.94$$

To test the significance of the relationship for a two-tailed test, we applied Z-test.

$$Z = r_s \sqrt{n-1} = 0.94 \sqrt{6-1}$$

$$Z = 0.94 \sqrt{5} = 0.94 \times 2.24$$

$$Z_{cal} = 2.11$$

$$Z_{tab, 0.05} = \pm 1.96$$

Decision: We reject the null hypothesis ( $H_{08}$ ) since the calculated value = 2.11 > 1.96 the critical value (1.96). Thus, we conclude that a significant correlation exists between product lines and sales volume in the Nigeria brewing industry.

$H_{09}$ : There is no significant relationship between product lines and customer loyalty in the Nigerian brewing industry.

$$r_s = \frac{1 - 6 \times 4}{6(6^2 - 1)} = \frac{1 - 24}{210} = \frac{1 - 24}{210}$$

$r_s$  co-efficient = 0.89 (this implies the sample correlation of x and variables is high)

For the test of significance between the two variables, we used Z-test,

$$Z = r_s \sqrt{n-1}$$

$$Z = 0.89 \sqrt{6-1} = 0.89 \sqrt{5} = 0.89 \times 2.24$$

$$Z_{cal} = 1.99$$

$$Z_{tab, 0.05} = \pm 1.96$$

Decision: We reject the null hypothesis ( $H_{09}$ ) since the calculated value = 1.99 > 1.96 the critical value and

conclude that product lines and customer loyalty are significantly correlated in the breweries.

$H_{010}$ : There is no significant relationship between product design and profitability in the Nigerian brewing sector.

$$r_s = \frac{1 - 6 \sum d^2}{n(n^2 - 1)} = \frac{1 - 6 \times 12}{210} = 0.66$$

$r_s$  co-efficient = 0.66 (This suggests that a considerable degree of correlation exists between product design and profitability in the Nigerian brewing industry). For a test of significance of the relationship between the two variables, we adopted z-test:

$$Z = r_s \sqrt{n-1} = 0.66 \sqrt{6-1} = 0.66 \sqrt{5} = 0.66 \times 2.24$$

$$Z = 1.48$$

$$Z_{cal} = 1.48$$

$$Z_{tab, 0.05} = \pm 1.96$$

Decision: We accept the null hypothesis  $H_{010}$  since the calculated value of Z ( $z_{cal}$ ) = 1.48 <  $\pm 1.96$  and design and conclude that the relationship between product design and profitability is not significant in the brewing industry.

$H_{011}$ : There is no significant relationship between product design and sales volume in the breweries.

$$r_s = \frac{1 - 6 \sum d^2}{n(n^2 - 1)} = \frac{1 - 6 \times 6}{210} = \frac{1 - 36}{210} = 0.82$$

$r_s$  co-efficient = 0.82 (This implies, a perfect correlation between variables x and y).

To test the significance of the relationship between product design (PD) and sales volume (SV), Z-test was used:

$$Z = r_s \sqrt{n-1} = 0.82 \sqrt{6-1} = 0.82 \sqrt{5} = 0.82 \times 2.24$$

$$Z_{cal} = 1.84$$

$$Z_{tab, 0.05} = \pm 1.96$$

Decision: The test result shows that the calculated z value = 1.84 < 1.96 (the critical value). Thus we accept

the null hypothesis ( $H_{01}$ ) and conclude that the correlation between product design and sales volume is not significant.

$H_{012}$ : There is no significant relationship between product design and customer loyalty in the brewing industry.

$$r_s = \frac{1 - 6 \times 18}{6(6^2 - 1)} = \frac{1 - 6 \times 18}{210} = 0.49$$

$r_s$  co-efficient = 0.49 (This implies a weak correlation between  $x$  and  $y$  variables.)

To test the significance of the relationship for a two-tailed test, Z-test was adopted:

$$Z = r_s \sqrt{n - 1}$$

$$Z = 0.49 \sqrt{6 - 1} = 0.49 \sqrt{5} = 0.49 \times 2.24$$

$$Z_{cal} = 1.09$$

$$Z_{tab, 0.05} = \pm 1.96$$

Decision: We accept the null hypothesis ( $H_{012}$ ) since the calculated value of  $z = 1.09 < \pm 1.96$  and conclude that the correlation between product design and customer loyalty is not significant in the Nigerian brewing industry.

## DISCUSSION OF FINDINGS

This study examined the impact of product development on corporate performance in the Nigerian brewing Industry. The study has made salient revelation regarding product development in the areas of product quality, product size, product lines and product design and the extent to which they impacted on corporate performance such as profitability, sales volume and customer loyalty. As regards the extent to which the brewing companies used product development as a strategy for improved corporate performance, most of the respondents revealed that their organizations considered continuous product development as a strategy for improved corporate performance in the dynamic and competitive brewing environment in Nigeria. The reason for this may not be unconnected with the innovation in the brewing and characterized by intense local and foreign competition.

Today, the brewing industry is a successful sub-sector in the Nigerian manufacturing industry. The acceptance and public goodwill the brewing sector is enjoying is in part a function of social responsibility and innovative products and services, which now appeal to much wider audience than in the past. This finding is supported by Drucker (1997) who found that organizations adopted product development as a strategy of growth, competitive edge and survival. It was also found in the study that the quality of both the alcoholic and non-alcoholic products

offered by breweries to customers had a great impact on the profitability, sales volume and customer loyalty of the brewing organizations. This is factual because this revelation represented the position or views of most of the respondents as expressed by the means scores of 4.5, 4.2 and 4.7 in our analysis. This was further validated and confirmed by hypothesis testing in Table 1. The finding corroborates the views expressed by Duncan and Earl (2004:18) that the quality of products service offerings to a large extent determined the profitability and market position of the organizations sampled. The finding is also in line with Stanton (1996) who asserted that product quality is the core element upon which the other marketing elements mix rest. Product was a veritable weapon in the firms' marketing arsenal sampled. Thus, a brewery whose quality of product is poor or perceived by customers as been unsatisfying can be sure to court or record low sales, which can hurt profit greatly. Similarly, products that do not relate or meet the real needs of customers cannot generate revenue for the breweries. Returns on investment and market share can be negatively impacted by poor and shoddy products. The profitability and sales volumes of such big breweries such as Nigerian breweries plc and Guinness depends largely on the quality of their products. The study further revealed that product size was positively correlated with profitability, sales volume and customer loyalty. This is confirmed by the results by the hypotheses tests in Tables 2, 3 and 4 which established a positive correlation between the variables. However, the correlation was not significant.

Today, breweries package their alcoholic and non-alcoholic drinks in various sizes (big and small). These appeal to and meet the needs of their customers, thereby helping the firm to make more profit, experience an increase in sales volume through continued customer loyalty. The insignificance of the correlation between product size and the corporate performance facets of profit ability, sales volume and customer loyalty may be explained the fact that although size is an important element of the product development strategy in the brewing industry, it cannot be concluded that it is a very strong factor. The product must be of high quality and satisfy the real need of customers in terms of taste and other benefits. Product size alone cannot assure profitability, sales volume or make customers to remain with their brands.

The next issue examined in the study was the linkage between product lines and corporate performance. It was found in the study that a positive and significant relationship exists between product lines, sales volume and customer loyalty in the Nigerian brewing industry as brands like Star, Gulder Harp, and Smirnoff Ice etc. It non alcoholic brands include maltina and fayrouz. Guinness (Nig) Plc manufactures great brands such as extra-stout, extra-smooth, etc. Thus, the high sales volume and profit reported by these firms derives to a considerable extent

**Table 1.** Spearman Rank Order Test of Correlation between Product Quality (PQ) and Profitability (P).

Responses	PQ	P	Rank x	Rank y	D	d <sup>2</sup>
	x	Y			R <sub>x</sub> – R <sub>y</sub>	
01	1.15	1.79	3	5	-2.0	4
02	1.89	2.90	8	17	-9.0	81
03	2.02	4.79	10	32	-22.0	484
04	2.37	4.72	13	30	-17.0	289
05	2.78	2.82	17	15	2.0	4
06	4.69	3.96	26	22	4.0	16
07	4.71	4.26	27	24	3.0	9
08	1.08	2.63	2	13	-11.0	121
09	3.88	2.47	24	12	12.0	144
10	3.95	3.53	25	20	5.0	25
11	4.89	3.42	30	18	12.0	144
12	3.05	2.67	21	14	7.0	49
13	2.72	2.83	16	16	0.0	0
14	2.96	3.77	18	21	-3.0	9
15	2.21	2.27	11	9	2.0	4
16	3.84	1.98	22	7	15.0	225
17	2.31	3.48	12	19	-7.0	49
18	2.99	4.71	19	29	-10.0	100
19	2.46	4.68	14	28	-14.0	196
20	4.94	4.75	32	31	1.0	1
21	4.80	4.63	29	27	2.0	4
22	1.07	1.00	1	1	0.0	0
23	1.95	1.08	9	2	7.0	49
24	1.40	1.90	5	6	-1.0	1
25	1.61	2.28	6	10	-4.0	16
26	1.88	2.35	7	11	-4.0	16
27	3.02	1.58	20	3	17.0	289
28	4.90	2.25	31	8	23.0	529
29	1.29	1.75	4	4	0.0	0
30	3.85	4.48	23	26	-3.0	9
31	4.76	4.36	28	25	3.0	9
32	2.57	4.15	15	23	-8.0	64
Sum					0	Σd <sup>2</sup> = 2,940

validated and confirmed by the results of the hypotheses tests in analysis in Tables 5, 6 and 7. This implies that breweries with many product lines or mixes can make more profit, record high sales volume and customer loyalty than those with few product lines or few product mixes. The Nigerian Breweries Plc and Guinness Plc are a few of the breweries that appear to place high premium on product lines and mix in their product development arsenal. Nigerian Breweries Plc Manufactures alcoholic and non-alcoholic products such as beer of assorted from having many product lines and product mixes. This finding corroborates the work of Tunji (2004) in the financial sector that banks that had more product/services

lines and mix recorded higher profit and market share than those with few service scopes.

The study further revealed that product design was positively correlated with profitability, sales volume and customer loyalty. However this correlation was not significant as reflected by result of the hypotheses tests in our analysis in Table 8, 9 and 10. Product design finds expression in the shape of the container (can or bottle) which unarguably has some aesthetic values. The insignificance of the relationship between product design and the corporate performance facets of profitability, sales volume and customer loyalty in the Nigerian brewing Industry tends to suggest that the content is more

**Table 2.** Relationship between Product Quality (PQ) and Sales Volume (SV).

Responses	PQ	SV	Rank x	Rank y	d	d <sup>2</sup>
	x	Y			Rx - Ry	
01	1.3	1.4	3	4	-1.0	1
02	3.5	1.8	15	9	6.0	36
03	2.5	1.0	9	2	7.0	49
04	4.8	2.5	24	16	8.0	64
05	2.9	2.7	12	18	-6.0	36
06	4.9	4.1	31	28	3.0	9
07	4.3	3.6	20	22	-2.0	4
08	3.7	1.2	18	3	15.0	225
09	5.0	5.0	32	32	0.0	0
10	3.1	1.8	13	7	6.0	36
11	1.8	2.1	6	12	-6.0	36
12	4.7	3.9	22	26	-4.0	16
13	2.4	2.4	7	15	-8.0	64
14	4.9	3.0	29	20	9.0	81
15	4.6	2.2	21	14	7.0	49
16	4.7	3.8	23	25	-2.0	4
17	1.2	4.1	2	27	-25.0	625
18	4.8	4.9	26	31	-5.0	25
19	4.9	2.5	30	17	13.0	169
20	1.3	3.0	4	19	-15.0	225
21	3.7	4.9	19	30	-11.0	121
22	3.7	3.7	17	23	-6.0	36
23	2.8	2.2	11	13	-2.0	4
24	2.6	1.9	10	11	-1.0	1
25	3.1	1.8	14	8	6.0	36
26	4.9	1.4	28	5	23.0	529
27	1.2	1.0	1	1	0.0	0
28	2.4	3.7	8	24	-16.0	256
29	1.5	1.7	5	6	-1.0	1
30	4.8	3.1	27	21	6.0	36
31	3.6	1.8	16	10	6.0	36
32	4.8	4.5	25	29	-4.0	16
Sum					0	Σd <sup>2</sup> = 2,826

important than the container. Although the shape or colour of the product (alcohol and non-alcoholic) may appeal to the consumer at first sight or entice him to have a trial of the product, his repeat purchase, however, will depend on the satisfaction derived from consumption. His loyalty or disloyalty to the brand determines the level of sales and profitability of the firm. This is because corporate profitability and increased sales volume derives largely from customer patronage (Table 11).

### Summary

In the preceding section, the data gathered from the study were presented and analyzed using appropriate

statistical tools and packages. Discussion of findings was also presented based on the analyzed data. The findings of our study on product development and corporate performance in the Nigerian brewing sector are summarized as follows:

- The quality of the product by the breweries greatly affects their profitability depending on customer's acceptance or rejection of their products.
- A positive and significant correlation exists between the quality of products manufactured by the breweries and their sales volume.
- The degree of quality of products offered for sale by the breweries significantly influences the level of customer

**Table 3.** Test of Relationship between Product Quality (PQ) and Customer Loyalty (CL).

Responses	PQ	CL	Rank x	Rank y	d	d <sup>2</sup>
	x	Y			Rx - Ry	
01	3.6	3.0	20	13	7.0	49
02	4.1	4.2	23	26	-3.0	9
03	2.2	3.2	11	15	-4.0	16
04	3.5	3.4	19	19	0.0	0
05	4.5	4.2	29	28	1.0	1
06	4.5	2.8	30	12	18.0	324
07	1.7	4.5	5	29	-24.0	576
08	3.2	2.1	18	7	11.0	121
09	1.3	1.3	2	1	1.0	1
10	3.0	4.1	16	24	-8.0	64
11	2.1	4.0	10	22	-12.0	144
12	4.4	3.3	28	17	11.0	121
13	4.3	4.9	27	32	-5.0	25
14	2.6	4.2	14	27	-13.0	169
15	4.8	4.7	31	31	0.0	0
16	2.1	2.1	9	6	3.0	9
17	3.1	4.0	17	23	-6.0	36
18	2.9	3.6	15	21	-6.0	36
19	2.5	4.2	13	25	-12.0	144
20	4.3	3.4	26	18	8.0	64
21	2.0	2.0	8	4	4.0	16
22	4.2	3.5	25	20	5.0	25
23	5.0	4.6	32	30	2.0	4
24	1.8	2.6	7	10	-3.0	9
25	3.6	2.0	21	5	16.0	256
26	4.0	2.6	22	11	11.0	121
27	1.4	2.2	4	8	-4.0	16
28	1.1	3.1	1	14	-13.0	169
29	4.1	2.2	24	9	15.0	225
30	1.4	1.4	3	2	1.0	1
31	1.8	3.3	6	16	-10.0	100
32	2.3	1.4	12	3	9.0	81
Sum					0	$\Sigma d^2=2,932$

loyalty in the brewing industry in Nigeria.

- There is no significant relationship between product size and profitability in the Nigerian brewing industry.
- The relationship between product size and sales volume is not significant in the Nigerian brewing industry.
- The correlation between product size and customer loyalty in the Nigerian brewing industry is not significant because customers' patronage is not solely a function of size of the products.
- There is a significant and positive correlation between product line/mix and profitability since a brewery with more product lines and product mix can make more profit by offering assorted brands of products.

- Product line/product mix and sales volume are positively correlated as the breweries with many product lines/product mixes (assortment) will record higher sales level than those with one product line/little mix.
- A positive and significant relationship exists between product lines/product mix and customer loyalty in the Nigerian brewing sector as a result of the satisfaction derived by customers in the various market segments of the organizations.
- The correlation between product design and profitability is not significant in the Nigerian brewing sector because product shape and colour alone cannot induce customer patronage if the quality of the poor is not favourably

**Table 4.** Test of Relationship between Product Size (PS) and Profitability (P).

Responses	PS	P	d			
	x	Y	Rank x	Rank y	Rx - Ry	d <sup>2</sup>
01	4.2	3.6	25	21	4.0	16
02	1.1	2.3	2	10	-8.0	64
03	1.6	4.3	3	28	-25.0	625
04	2.5	1.3	11	2	9.0	81
05	2.8	1.9	13	7	6.0	36
06	3.8	1.6	22	5	17.0	289
07	3.0	2.5	14	11	3.0	9
08	3.9	2.9	24	15	9.0	81
09	3.5	2.7	20	12	8.0	64
10	4.5	3.5	27	20	7.0	49
11	3.9	2.8	23	14	9.0	81
12	2.0	2.7	6	13	-7.0	49
13	3.2	1.6	17	3	14.0	196
14	4.7	5.0	29	32	-3.0	9
15	1.1	2.1	1	9	-8.0	64
16	3.4	2.0	19	8	11.0	121
17	2.2	4.1	7	25	-18.0	324
18	4.8	3.2	31	17	14.0	196
19	2.3	4.0	8	24	-16.0	256
20	1.8	1.1	4	1	3.0	9
21	4.4	4.8	26	30	-4.0	16
22	3.8	4.8	21	31	-10.0	100
23	2.3	1.6	9	4	5.0	25
24	1.9	3.2	5	18	-13.0	169
25	4.7	3.9	30	23	7.0	49
26	3.1	3.3	15	19	-4.0	16
27	4.9	4.6	32	29	3.0	9
28	2.6	3.8	12	22	-10.0	100
29	3.4	1.8	18	6	12.0	144
30	2.5	4.2	10	27	-17.0	289
31	4.6	4.1	28	26	2.0	4
32	3.1	3.1	16	16	0.0	0
Sum					0	$\Sigma d^2=3,540$

perceived by customer.

- There is no significant relationship between product design and sales volume since customers do not patronize the products because of its shape, size or colour.

- The relationship between product design and customer loyalty is not significant in the Nigerian brewing industry because what keeps the customer loyal to the brand is not necessary the shape, size or colour of the product but the satisfaction he derives from consuming it.

### Recommendations

Based on the findings we strongly recommend as follows:-

- Breweries should always analyze their environment through research in order to identify new market opportunities to develop appropriate products to meet the changing needs and wants of customers.

- Breweries should ensure that the quality of their products meets the expectation of their customers in the local and international markets since their product quality is a strong and significant factor in the firms' marketing strategy and performance.

- Continuous attention should be given to research and development (R&D) so that more innovative products could be manufactured for improved corporate performance.

**Table 5.** Test of Relationship between Product Size (PS) and Profitability (P).

Responses	PS	P	Rank x	Rank y	d	d <sup>2</sup>
	x	Y			Rx - Ry	
01	4.2	3.6	25	21	4.0	16
02	1.1	2.3	2	10	-8.0	64
03	1.6	4.3	3	28	-25.0	625
04	2.5	1.3	11	2	9.0	81
05	2.8	1.9	13	7	6.0	36
06	3.8	1.6	22	5	17.0	289
07	3.0	2.5	14	11	3.0	9
08	3.9	2.9	24	15	9.0	81
09	3.5	2.7	20	12	8.0	64
10	4.5	3.5	27	20	7.0	49
11	3.9	2.8	23	14	9.0	81
12	2.0	2.7	6	13	-7.0	49
13	3.2	1.6	17	3	14.0	196
14	4.7	5.0	29	32	-3.0	9
15	1.1	2.1	1	9	-8.0	64
16	3.4	2.0	19	8	11.0	121
17	2.2	4.1	7	25	-18.0	324
18	4.8	3.2	31	17	14.0	196
19	2.3	4.0	8	24	-16.0	256
20	1.8	1.1	4	1	3.0	9
21	4.4	4.8	26	30	-4.0	16
22	3.8	4.8	21	31	-10.0	100
23	2.3	1.6	9	4	5.0	25
24	1.9	3.2	5	18	-13.0	169
25	4.7	3.9	30	23	7.0	49
26	3.1	3.3	15	19	-4.0	16
27	4.9	4.6	32	29	3.0	9
28	2.6	3.8	12	22	-10.0	100
29	3.4	1.8	18	6	12.0	144
30	2.5	4.2	10	27	-17.0	289
31	4.6	4.1	28	26	2.0	4
32	3.1	3.1	16	16	0.0	0
Sum					0	$\Sigma d^2=3,540$

**Table 6.** Test of Relationship between Product Size (PS) and Sales Volume (SV).

Responses	X (PS)	Y (SV)	RX	RY	D(RxRy)	d <sup>2</sup>
Very High Extent	10	6	6	4	2	4
High Extent	7	8	4	5	-1	1
Moderate Extent	8	11	5	6	-1	1
Low Extent	4	1	3	1	2	4
Very Low Extent	3	2	2	2	0	0
None at all	1	4	1	3	-2	4
	32	32			0	$\Sigma d^2=14$

**Table 7.** Test of the Relationship between Product Size (PS) and Customer Loyalty (CL).

Responses	X(PS)	Rx	Y (CL)	Ry	D	d <sup>2</sup>
Very High Extent	6	4	13	6	-2	4
High Extent	9	6	8	5	1	1
Moderate Extent	7	5	5	4	-1	1
Low Extent	5	3	3	3	0	0
Very Low Extent	4	2	1	1	1	1
None at all	1	1	2	2	-1	1
	32		32		0	Σd <sup>2</sup> 8

**Table 8.** Test of Relationship between Product Lines (PL) and Profitability (P).

Responses	PL	P	Rank x	Rank y	d	d <sup>2</sup>
	X	Y			Rx - Ry	
01	4.7	4.2	28	27	1.0	1
02	2.0	1.8	7	9	-2.0	4
03	1.8	2.1	5	14	-9.0	81
04	2.8	1.4	15	4	11.0	121
05	2.2	2.1	10	16	-6.0	36
06	4.7	1.0	26	1	25.0	625
07	5.0	2.2	32	17	15.0	225
08	3.6	2.7	18	21	-3.0	9
09	2.4	2.1	11	15	-4.0	16
10	3.4	1.1	17	2	15.0	225
11	1.7	3.5	3	24	-21.0	441
12	2.2	1.9	9	10	-1.0	1
13	2.2	1.7	8	8	0.0	0
14	4.9	3.4	30	23	7.0	49
15	4.7	4.5	27	29	-2.0	4
16	4.8	4.8	29	32	-3.0	9
17	1.7	1.3	2	3	-1.0	1
18	3.7	1.9	20	11	9.0	81
19	3.8	1.6	22	5	17.0	289
20	3.7	4.5	21	30	-9.0	81
21	4.6	4.8	25	31	-6.0	36
22	1.9	2.8	6	22	-16.0	256
23	1.6	1.7	1	7	-6.0	36
24	3.7	2.6	19	20	-1.0	1
25	2.7	2.3	13	18	-5.0	25
26	2.7	3.9	14	25	-11.0	121
27	1.8	1.6	4	6	-2.0	4
28	4.9	4.2	31	26	5.0	25
29	4.1	1.9	23	12	11.0	121
30	2.7	2.3	12	19	-7.0	49
31	3.0	2.1	16	13	3.0	9
32	4.3	4.4	24	28	-4.0	16
Sum					0	2,998.00

**Table 9.** Spearman Rank Order Correlation Test of Relationship between Product Lines (PL) and sales Volume (SV).

Responses	X(PL)	Y(SV)	RX	RY	d	d <sup>2</sup>
Very High Extent	11	9	6	6	0	0
High Extent	6	8	4	5	-1	1
Moderate Extent	9	6	5	4	1	1
Low Extent	3	5	3	3	0	0
Very Low Extent	2	3	2	2	0	0
None at all	1	1	1	1	0	0
	32	32			0	$\Sigma d^2 = 2$

**Table 10.** Spearman rank Order Correlation test of Relationship between Product Lines (PL) and Customer Loyalty (CL).

Responses	X (PL)	Y (CL)	RX	RY	d	d <sup>2</sup>
Very High Extent	6	8	4	5	-1	1
High Extent	7	6	5	4	1	1
Moderate Extent	4	5	3	3	0	0
Low Extent	11	9	6	6	0	0
Very Low Extent	3	1	2	1	1	1
None at all	1	3	1	2	-1	1
Very High Extent	32	32			0	$\Sigma d^2 = 4$

**Table 11.** Spearman Rank Order Correlation Co-efficient Test of Linkage between Product Design (PD) and Profitability (P).

Responses	X(PD)	Rx	Y (P)	Ry	d	D <sup>2</sup>
Very High Extent	9	5	12	6	- 1	1
High Extent	10	6	7	5	1	1
Moderate Extent	3	3	1	1	2	4
Low Extent	7	4	4	3	1	1
Very Low Extent	2	2	5	4	-2	4
None at all	1	1	3	2	-1	1
	32		32		0	$\Sigma d^2 = 12$

- Breweries should also organize regular and continuous training for marketing managers and R&D personnel so as to update their professional skill and knowledge on product development.
- Product construction, packaging, branding, product positioning and usage testing should be an integral component of product development in the brewing sector.
- Effective information management and communication should be applied in the daily operations of the breweries as it can provide management and staff with data and understanding critical to successful product development.

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