Int Journal of Social Sciences Management and Entrepreneurship 7(2): 1084-1097, 2023

ISSN 2411-7323

www.sagepublishers.com

PRODUCT DEVELOPMENT STRATEGY AND COMPETITIVENESS OF ISO CERTIFIED MANUFACTURING FIRMS IN KENYA

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ABSTRACT

This research looked at product development strategy and competitiveness of ISO-certified manufacturing firms in Kenya to assess how, as one of the organic organizational strategies, it can be applied by firms at the corporate level to achieve competitiveness. The study sought to explore how the explanatory influenced the competitiveness of ISO-certified manufacturing firms in Kenya. The moderating variable, being industry characteristics, was introduced to establish the extent of the effect on the dependent variable. The study performed a descriptive survey targeting forty-one (41) ISO-certified manufacturing firms in Kenya. The primary data source was a self-administered structured questionnaire. A secondary data sheet was employed as a tool for measuring the dependent variable. The procedure for data collection was the 'drop and pick later' method. Data analysis was done using descriptive with mean score and standard deviation used. Inferential statistics was undertaken by applying the Pearson correlation coefficient and multiple regression model to analyze and determine the link between the predictor and the predicted. In testing the research hypothesis, the p- value in the Anova test was used while F-statistics was computed at 95% confidence level to test the possibility of existence of any significant relationship between product development strategy and competitiveness of ISO certified manufacturing firms in Kenya. The study found that firms employed innovation capability to improve productivity, brand recognition and value. In addition, firms employed product improvement to reduce production costs and improve brand recognition. Moreover, firms employed concept development to increase sales and solve design problems in their products/services. The study concluded that manufacturing firms in Kenya should have a product development strategy in place as this enhances firm competitiveness. The study also recommended that in future, scholars and researchers can test the relationship between product development strategy and firm competitiveness to bring rigour and offer platforms for comparison of findings.

Key Words: product development strategy; Innovation theory, competitiveness of ISO certified manufacturing firms; Porters five forces model.

Background of the Study

Corporate growth strategy, according to Pidun (2019) defines a firm's vision & mission and is concerned with questions on strategy development and implementation at the corporate level. Zugay and Zakaria, (2023) in the study on the Ansoff matrix espoused that the model is a tool that can be used by managers in identifying strategies for business growth, ranging from high to low risk. The model helps managers determine risk levels by having them focus products and services on the specific markets targeted by their firm.

The question then arises of what strategic model a firm can use to guarantee sustainable competitiveness. One of the strategic approaches advanced by Ansoff et al. (2019) is the optimization of a firm's strategic portfolio with the aim of achieving competitiveness through corporate strategies. This study sought to establish how product development strategy can be applied at the corporate level by organizations as an avenue for attaining competitiveness in the market(s) they operate in.

Statement of the Problem

The Big four (4) agenda, as pronounced by the then President of Kenya on 12th December 2017, comprised of four pillars namely; - Manufacturing, Affordable Housing, Food and Nutrition Security and Affordable Healthcare. Under the manufacturing pillar, the Big 4 agenda envisioned that the manufacturing sector should contribute at least 20% to GDP to by the year 2022. KAM, in their paper on manufacturing Priority Agenda (MPA) (2019) anticipated a 15% contribution to GDP by the same year, based upon 5 pillars, namely; competitiveness and level playing field; enhanced market access; pro-industry policy and institutional framework; government driven SME development and lastly securing the future of manufacturing industry.

In the period between the years 2015-2019, the manufacturing sector, on average, contributed 8.74% to GDP as outlined in Table 1.1. In the year 2019 alone, the Kenyan manufacturing sector contributed 7.9% to GDP (KNBS, 2023) against the 20% target by Big 4 agenda and 15% by KAM. Comparatively, contribution of the manufacturing sector to GDP for the Republic of South Africa and the Federal republic of Nigeria stood at 14% and 9.77% respectively, while the contribution of China's manufacturing sector to its GDP stood at 26% in the year 2019 (World Bank, 2021).

Failure by the manufacturing sector to achieve its potential as envisaged in the Big 4 Agenda and KAM could be an indication that manufacturing firms in Kenya have not been able to successively conceptualize competitiveness and/or adopt/develop appropriate models for competitiveness (KAM, 2018). This, as Were (2016) points out, could be as a result of a number of factors such as; (1) inadequacy of R&D by manufacturing firms in Kenya; (2) weakness in the link between Kenyan university's R&D and industry needs and (3) features that prevent think tanks and research institutes from providing applicable R&D to the sector.

Other challenges include formulation and poor implementation of overlapping policies and strategies that do not have clear operating mandates; and conflicting priorities in the different policies and strategies, bringing about a lack of prioritizing more so when choosing what and when to implement. Efforts have been made to revitalize the manufacturing sector. These efforts include creation of industrial parks, provision of credit loans, relaxation of stringent registration and operational rules and the enhanced fight against illicit trade (KAM, 2018).

Despite these efforts, the root cause of some of the problems afflicting the sector may not have been fully addressed. This is evidenced by the fact that growth in the manufacturing sector has averaged at 2.72% during the 5-year period between the years 2015-2019. Additionally, the

average contribution of the manufacturing sector to GPD has averaged at 8.74% during the same period (KNBS, 2023); well below the Big 4 agenda target of 20% and KAM target of 15%. Lastly, the average growth rate of Kenya's economy over the same period has been 5.56%, again below the targeted average GDP growth rate of 10% annually as envisaged under the economic pillar of Kenya's Vision 2030 blueprint.

Increased contribution of the manufacturing sector to GPD would greatly influence achievement of average GDP growth rate of 10%. Sustainable economic growth and development would lead to job creation, poverty alleviation and socio-economic development, measured by indicators such as GDP, life expectancy and literacy levels. It remains unclear whether the Kenyan manufacturing sector, at its current state, has correctly conceptualized competitiveness, whether it is sustainably competitive or whether it can meaningfully contribute towards sustainable social economic development of Kenya.

Zugay and Zakaria, (2023) in the study on Ansoff matrix espoused that the model is a tool that can be used by managers in identifying strategies for business growth, ranging from high to low risk. The model helps managers determine risk levels by having them focus products and services on the specific markets targeted by the firm. This formed the basis upon which this study raised the research question of whether manufacturing firms can employ the model, at corporate level to achieve competitiveness.

Objectives of the Study

i. To determine the influence of product development strategy on competitiveness of ISO-certified manufacturing firms in Kenya.
ii. To explore the moderating influence of Industry characteristics on product development strategy competitiveness of ISO Certified manufacturing firms in Kenya.

Research Hypothesis

The study hypothesized that:
H01: Product development strategy had no significant influence on competitiveness of ISO Certified Manufacturing firms in Kenya.

H02: Industry characteristics had no significant moderating influence on product development strategy and competitiveness of ISO Certified Manufacturing firms in Kenya.

Theoretical Framework

Innovation theory

Innovation Theory is attributed to the work of Joseph Alois Schumpeter in the first half of the twentieth century (Schumpeter, 1934). This supposition emphasized on the role of innovation in economic growth. Schumpeter (1934) believed that innovation was an essential driver of economic growth and therefore any industry looking for profitability must innovate. Innovation theory was used to anchor in product development theory into the study.

Porter's Competitive Theory

Porter's Competitive theory opines that a firm, before venturing into a business; must know its competitive scope in terms of how wide its target market is, the variety of products/services it wishes to produce, the distribution channels it wishes to use, the composition of buyers and geographic areas it wants to serve etc. The origin of competitive theory dates back to Porter (1980) who suggested that a firm draws its value from the competitive situation characterizing its end-product strategic position. Porter's theory was used to anchor industry characteristic as a moderator to the study.

Conceptual Framework

Varpio et al. (2020) defined the conceptual framework as an abstract or general idea inferred or derived from specific instances. It could be a word or phrase that symbolizes several interrelated ideas. Conceptualizing, according to Varpio et al. (2020) is inventing or contriving an idea or explanation and formulating it mentally. The conceptual framework outlined in figure 1.1 assisted the researcher in developing an understanding of the phenomena under scrutiny. It also assisted the researcher in drawing meaning and conclusion from the result findings.

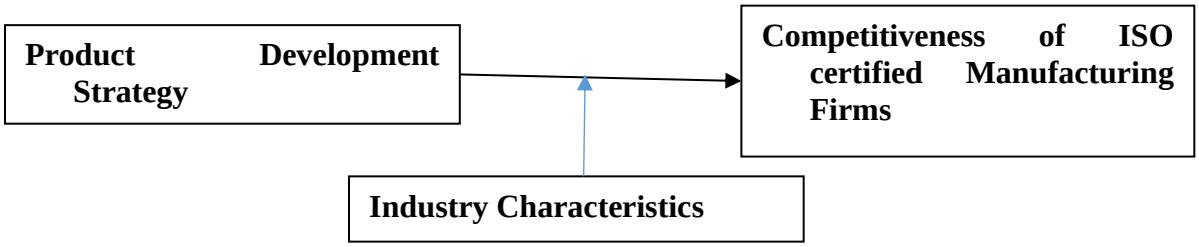

Figure 1. 1: Conceptual Framework

Product Development Strategy

Ansoff et al. (2019) defines product development as a strategy where a firm remains in its existing market but develops new products. Another definition advanced by Cimatti and Campana (2016) was that product development is a strategy of taking a company outside its existing business- the focus being to address the needs of the existing customers and the wider customer markets with new product lines.

Industry characteristics

Porter viewed the industry as a group of organizations performing related business activities in the form of products produced and sold (Bruijl, 2018). These industries can further be classified into larger categories which would be referred to as sectors. Another definition of industry was advanced by Fisk (2016) who argued that it is a sector of an economy that produces goods or services that are similar. A key feature of an industry is the major source of revenue for the producing organization. A typical example of an industry according to Ketels and Porter (2021) is the automobile industry.

Empirical Review

Product Development Strategy

Rose`n and Teskera (2017) carried out a study on the digitization of the product development process at Scania engine assembly Scania CV AB. The aim of the study was to help identify how segments of the product development process could be more digitalized. This entailed identifying the gaps that would occur between the current work process as well as finding solutions for the gaps pointed out. Data was collected within Scania company through archive analyses, interviews and observations. The study established gaps in the current operating environment and recommended automation through digitization of the product development process. The study also suggested that atomization of the product development process leads to benefits such as cost savings, quality improvements, shorter lead times and ergonomic workplaces.

Industry characteristics

Hermundsdottir and Aspelund (2021) did a study on sustainability and firm competitiveness in order to identify factors that mediate/moderate the interconnection. The study established that there exists a positive relationship between sustainable innovation and competitiveness. The study established that industry characteristics can moderate the relationship between sustainability innovation and competitiveness. The study also found out that this relationship was

complex and therefore contributed with the finding that national market, industry and firm-level factors have a moderating effect on the relationship. In conclusion, the study established that industry characteristics can moderate the relationship between sustainability innovation and competitiveness.

Iyer et Al. (2020) conducted a meta-analytic review of impulse buying. The research attempted to understand the relationship between impulse buying and its determinants with industry characteristics as a contextual moderator to the study. These determinants, the study established, were both internal and external e.g. traits, motives, consumer resources and marketing stimuli which emerged as key triggers of impulse buying. Based on the studies, Iyer et Al. (2020) established that indeed industry characteristics were a moderator to the study.

Research Methodology

This study adopted positivism philosophy based on qualitative and quantitative data. The study adopted a descriptive survey design targeting 41 Kenyan-based ISO-certified manufacturing firms were forty-one (41) in number, the majority of them located in Nairobi with a target population constituting 82 respondents (a representative of the top management & a representative of the board) for each of the 41 ISO-certified manufacturing firms. Key instruments for collecting primary data in this study were structured questionnaires. A secondary data sheet was employed as a framework for measuring the dependent variable. The data sheet formed part of the questionnaire. Out of the initial sample size of 54 subjects, the study targeted 6 subjects for the pretest. Opinion from Lawoko (2019) suggested that a questionnaire pre-test is done to observe respondents' reactions and attitudes and clear any ambiguities in the questions. The questionnaire is revised before administering to the target group in case some ambiguities are noted at the pre-test stage.

Quantitative analysis was used to convert data into information. This involved data processing, presentation, and interpretation. Data analysis involved statistical analysis of the closed-ended items in the questionnaire. Statistical Package for the Social Sciences (SPSS) was used to help in data analysis as well as in generating descriptive and inferential statistics. The descriptive statistical techniques encompassed distribution tables and percentages. Measures of central tendency i.e. mean and standard deviations were used. Inferential statistics was done using Pearson's correlation analysis and multiple standard regression to show the relationships between variables. The estimated multiple linear regression model was defined based on the model specification.

Model specification

A multiple linear regression model was used in this study in the form:

Equation 1: $Y= \beta_0 + \beta_1 X_1 + e$ (Without moderator)

Equation 2: $Y= \beta_0 + \beta_1 X_1 * Z + e$ (With moderator)

Whereby:

Y = Firm Competitiveness;

$\beta 0$= Constant associated with the regression model

β_1= Parameter;

X_1= Product development Strategy (PDS)

Z= Industry characteristics (IC)

e = Error Term

Final Moderated Model: $Y= \beta_0 + \beta_1 X_1 * Z + Z * Z + e$

Descriptive Analysis of the Findings

Through descriptive statistics, the researcher is able to show the extent to which research findings have answered the research questions (Mishra et al., 2019). A descriptive analysis was carried out where the respondents' views of the research questions were reported as they were. The main statistics included the standard deviation, means and percentages. Analysis was done systematically based on the research objectives of the study.

Product Development Strategy

The respondents were asked to indicate their level of agreement or disagreement with key statements in the questionnaire. A 5-points Likert's scale was used where 1 indicated strongly disagreement, 2 = disagree, 3- neutral, 4= agree and 5= strongly agree. The findings are as shown in Table 1.2.

Table 1.2: Descriptive Analysis for Product Development Strategy

Statements	SD	D	N	A	SA	Mean	Std. Dev.
Our firm employs innovation capability to improve productivity.	7.7%	4.3%	20.4%	55.6%	12.0%	3.59	1.00
Our firm adopts innovation capability to improve brand recognition and value	3.4%	5.1%	27.9%	46.8%	16.8%	3.58	.82
Our firm employs product improvement to reduce production costs.	2.6%	16.2%	7.7%	24.8%	48.7%	4.00	1.20
Our firm adopts product improvement for improvement and recognition of product brand.	7.7%	3.4%	9.4%	12.0%	67.5%	4.28	1.23
Our firm employs concept development to increase sales.	5.1%	4.3%	6.0%	72.6%	12.0%	3.82	.88
Our firm utilizes concept development to solve design problems in our product/ service offering.	13.7%	3.4%	6.8%	65.0%	11.1%	3.56	1.16

Key: *SD= Strongly Disagree; D= Disagree; N= Neutral; A= Agree; SA= Strongly Agree*

As the findings portray, majority of the respondents agreed that their firms employed innovation capability to improve productivity (Strongly Agree = 12.0%; Agree = 55.6%, Mean = 3.59, standard deviation = 1.00). The measure of dispersion around the mean of the statements was 1.00 indicating the responses were varied. In addition, majority of the respondents agreed that their firms adopted innovation capability to improve brand recognition and value (Strongly Agree = 16.8.5%; Agree = 46.8%, Mean = 3.58, standard deviation = 0.82). The measure of dispersion around the mean of the statements was 3.58 indicating that the responses were varied. Findings also portrayed that majority of the respondents agreed that their firms employed product improvement to reduce production costs. (Strongly Agree = 48.7%; Agree = 24.8%, Mean = 4.00, standard deviation = 1.20). The measure of dispersion around the mean of the statements was 1.20 indicating the responses were varied

In addition, majority of the respondents agreed that their firms adopt product improvement for improvement and recognition of product brand (Strongly Agree = 67.5%; Agree = 12.0%, Mean = 4.28, standard deviation = 1.23). The measure of dispersion around the mean of the statements was 1.23 indicating the responses were varied. Further, majority of the respondents agreed that their firm employs concept development to increase sales (Strongly Agree = 12%; Agree = 72.6%, Mean = 3.82, standard deviation = 0.88). The measure of dispersion around the mean of the statements was 0.88 indicating the responses were varied. Lastly, from the results, majority of the respondents agreed that their firms utilize concept development to solve design problems in their product/ service offering. (Strongly Agree = 11.10%; Agree = 65.0%, Mean = 3.56, standard deviation =

1.16). The measure of dispersion around the mean of the statements was 1.16 indicating the responses were varied.

The findings implied that product development strategy is a key aspect of strategies adopted by ISO certified manufacturing firms in Kenya and that the strategy is essential in enhancing growth thus leading to competitiveness. These findings agreed with Al Dulaimi et al. (2022) study on innovation capabilities and human development competitiveness in the education sector in the United Arab Emirates which found that innovation capabilities played a significant role in human development competitiveness. However, Al Dulaimi et al. (2022) noted that the impact between innovation capability and human development competitiveness is dependent on the quality of the innovation's ability.

The findings were also in agreement with Guo et al. (2020) study on Green product development under competition: A study of the fashion apparel industry. The study found that product development affects competitiveness. In a modelled industry that had 1 manufacturer and 2 firms, more competition between the firms led to a lower optimal greenness level (green product development in the fashion apparel industry) in the whole chain. Conversely, joint decisions made in the model industry led to higher optimal greenness levels in the entire channel, created by a situation whereby jointly, retailers charged a higher price for their products (Guo et al., 2020). The researchers concluded by stating that underdevelopment of the green fashion products is a result of features in the fashion industry such as an exceedingly competitive environment.

Industry characteristics

The second objective of the study was to explore the moderating influence of industry characteristics on the product development strategy and competitiveness of ISO Certified manufacturing firms in Kenya. Respondents were asked to indicate their level of agreement or disagreement with specific statements drawn from sub-constructs under industry characteristics which was a moderator to the study. A five-point Likert scale was used where 1 indicated strongly disagree, 2 = disagree, 3- neutral, 4= agree and 5= strongly agree. The findings are shown in Table 1.3.

Table 1.3: Descriptive Analysis for Industry Characteristics

Statement	SD	D	N	A	SA	Mean	Std. Dev.
Suppliers have the power to determine the prices of the goods/services they supply us with.	9.4%	13.7%	11.2%	19.7%	46.0%	3.99	0.97
Buyers have the power to demand higher quality products.	7.7%	12.8%	4.3%	23.9%	51.3%	3.98	1.33
New entrants are competitors to current companies within an industry.	17.9%	6.8%	7.0%	17.9%	50.4%	3.76	1.55
We minimize the threat of substitute products by creating unique product offerings that satisfy specific needs so customers are not easily swayed by substitute products.	3.4%	15.4%	7.7%	57.3%	16.2%	3.67	1.03
We use competitive rivalry as a measure of the extent of competition among firms in the industry. Competitive rivalry impacts on profits, leads to price cutting, increased advertising expenditures, or spending on service/product improvements and innovation.	41.4%	13.0%	7.1%	5.6%	33.0%	3.82	1.01

Key: *SD= Strongly Disagree; D= Disagree; N= Neutral; A= Agree; SA= Strongly Agree*

The findings revealed that most of the respondents agreed that suppliers had the power to determine the prices of the goods/services they supply firms (Strongly agree 46.00%; agree 19.7%; Mean = 3.99; standard deviation = 0.97). The measure of dispersion around the mean of the statements was 0.97 indicating the responses were varied. The respondents also indicated that buyers had the power to demand higher quality products (Strongly agree 51.3%; agree 23.90%; mean of 3.98 and a standard deviation of 1.33. The measure of dispersion around the mean for the statements was 1.33 indicating the responses were varied.

The findings further revealed that new entrants are competitors to current companies within an industry (strongly agree = 50.4%; Agree = 17.9%; mean = 3.76 and standard deviation 1.55). The measure of dispersion around the mean was 1.55 indicating the responses were varied. The findings further revealed that firms mminimize the threat of substitute products by creating unique product offerings that satisfy specific needs so customers are not easily swayed by substitute products. (strongly agree = 16.2%; Agree = 57.3%; Mean = 3.67 and standard deviation of 1.03). The measure of dispersion around the mean of the statements was 1.03 indicating the responses were varied.

It was also established that firms use competitive rivalry as a measure of the extent of competition among firms in the industry. Competitive rivalry impacts on profits, leads to price cutting, increased advertising expenditures, or spending on service/product improvements and innovation ((strongly agree = 33%; Agree = 5.6%; Mean 3.82; standard deviation = 1.01). The measure of dispersion around the was 1.01 indicating the responses were varied.

The study findings agreed with Hermundsdottir and Aspelund (2021) who did research on sustainability and firm competitiveness in order to identify factors that mediate/moderate the interconnection. The study established that national market, industry and firm-level factors have a moderating effect on the relationship. In conclusion, the study established that industry characteristics can moderate the relationship between sustainability innovation and competitiveness.

Additionally, the descriptive statistical findings on industry characteristics agreed with Iyer et Al., (2020) who conducted a meta-analytic review of impulse buying to try to understand the relationship between impulse buying and its determinants. The study sought to examine industry characteristics as a contextual moderator in the study. Based on existing studies, Iyer et Al., (2020) established industry characteristics as a moderator to the study.

Regression Analysis

The research employed multiple regression analysis to determine the linear statistical relationship between the independent and dependent variables. According to Singh et al. (2019), regression analysis helps explain the statistical relationship between variables thus enhancing the ability of a study to make substantive conclusions and recommendations. The statistical objective of regression analysis is to show high R^2 and significant t-values, thus rejecting the null hypothesis of no influence (Singh et al., 2019). Parameters with an absolute t-value greater than 1.96 indicate a significance level of 0.05 (i.e. $p<0.05$).

Product development strategy

The study sought to determine the influence of product development strategy on the competitiveness of ISO-certified manufacturing firms in Kenya. From this objective, the hypothesis of the study was drawn:

H_{O2}: Product development strategy has no significant influence on the competitiveness of ISO Certified Manufacturing firms in Kenya.

Model summary, ANOVA test and regression coefficients were used to display the results on the regression model for the second hypothesis of the study. The model was as follows:

$$\mathbf{Y= \beta_0+ \beta_1 X_1 * Z+ } \boldsymbol{e}$$

The model summary results were as shown in Table 1.4.

Table 1.4: Regression Results on Product Development Strategy

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.600[a]	.360	.354	.73924

a. Predictors: (Constant), product development strategy

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	35.312	1	35.312	27.544	.000[b]
	Residual	62.845	49	1.282		
	Total	98.156	50			

a. Dependent Variable: Competitiveness of ISO-certified manufacturing firms in Kenya.
b. Predictors: (Constant), product development strategy

Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.105	.206		5.361	.000
	Product development strategy	.597	.074	.600	8.038	.000

a. Dependent Variable: Competitiveness of ISO-certified manufacturing firms in Kenya.

The results revealed that the R-square(R^2) for the model was 0.360. This implied that Product development strategy had a 36% impact on the variation on competitiveness of ISO-Certified Manufacturing firms in Kenya.

The ANOVA results on the other hand revealed that the F-statistic was 27.544 at a significant level of 0.000. This being less than the standard P-value of 0.05, the findings implied that the model could significantly predict the relationship between product development strategy and competitiveness of ISO-Certified Manufacturing firms in Kenya.

The regression model results revealed that the β for the variable (product development strategy) was 0.597. From the findings, the following model was deduced:

$$\mathbf{Y = 1.105 + 0.597 X_2 + } \boldsymbol{e}$$

The results implied that when regressed alone with the dependent variable (competitiveness of ISO Certified Manufacturing firms in Kenya), a unit change in product development strategy could influence up to 59.7% of competitiveness of ISO Certified Manufacturing firms in Kenya. The P-value for the variable in the model was 0.000 which implied that this being less than the standard p-value of 0.05, product development strategy had a significant and positive influence on the competitiveness of ISO Certified Manufacturing firms in Kenya.

These results also agreed with the findings of Rose`n and Teskera (2017) in their study on the Digitalization of the product development process at Scania engine assembly who found that product development strategy influences organization competitiveness. The study findings were also in agreement with the study by Ihenachor et al. (2020) on the role of product development practices on new product performance: Evidence from Nigeria's financial services providers that established that in Nigeria, new financial product performance is inferior due to poor product development practices.

Overall Regression Model

The study carried out an overall regression model analysis (multivariate) to establish the combined effect of product development strategy on competitiveness of ISO Certified manufacturing firms in Kenya. The findings on product development strategy are as shown in the model summary, ANOVA test and the regression coefficients on Table 1.5 below.

Table 1.5: Overall Regression Model Results (Unmoderated)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.892[a]	.795	.787	.42408

a. Predictors: (Constant), product development strategy,

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	78.014	4	19.503	44.53	.000[b]
	Residual	20.142	46	.438		
	Total	98.156	50			

a. Dependent Variable: Firm Competitiveness

b. Predictors: (Constant), product development strategy

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.093	.135		.687	.494
	Product Development Strategy	.140	.052	.141	2.702	.008

a. Dependent Variable: Competitiveness of ISO-certified manufacturing firms in Kenya.

The Model Summary results revealed that the R-square for the model is 0.795. This implied that product development strategy could lead up to 79.5% variation of the competitiveness of ISO Certified manufacturing firms in Kenya.

The ANOVA results are as also as shown. The results revealed that the F-statistic for the model as 44.53 at a significant level of 0.000. This being less than the standard p-value of 0.05, implied that the model could significantly predict the relationship between product development strategy and competitiveness of ISO-certified manufacturing firms in Kenya.

The regression coefficients results are also as herein shown. The results led to the following model:

$$\mathbf{Y = 0.93 + 0.140X_1 + \mathit{e}}$$

The findings implied that a unit change in product development strategy influences up to 14% of competitiveness of ISO certified manufacturing firms in Kenya.

Optimal Model

The study sought to establish the moderating effect of Industry characteristics on the relationship between product development strategy and competitiveness of ISO-certified manufacturing firms in Kenya. From the objective, the following null hypothesis was drawn:

H_{O5}: Industry characteristics have no significant moderating influence on product development strategy and competitiveness of ISO Certified Manufacturing firms in Kenya.

The model for the moderating effect was:

$$\mathbf{Y=\beta_0+ \beta_1X_1*Z+Z*Z+}\boldsymbol{e}$$

Where Z is the moderator (Industry characteristics),

$\beta 0$ =Constant associated with the regression model
β_1, =Parameter;
Z= Industry Characteristic (moderator)
X_1 =Product Development Strategy
e- Error Term
The results are shown in Table 1.6 below

Table 1.6 Results of the Overall Moderated Model (Moderated)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.934[a]	.872	.866	.37646

a. Predictors: (Constant), Industry characteristics, product development strategy * Industry characteristics.

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	106.709	5	21.342	61.152	.000[b]
	Residual	15.731	45	.349		
	Total	122.440	50			

a. Dependent Variable: Competitiveness of ISO-certified manufacturing firms in Kenya.
b. Predictors: (Constant), Industry characteristics, product development strategy.

Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.325	.224		1.449	.150
	product development strategy * Industry characteristics	.095	.056	.082	1.703	.091
	Industry characteristics	-.094	.065	-.050	-1.448	.150

The R^2 for the overall model before the moderation was 0.795 and after the introduction of the moderator, it increased to 0.872. This was an implication that following the introduction of Industry characteristics as the moderator, the strength of product development strategy towards the variation of competitiveness of ISO-certified manufacturing firms in Kenya increased by 0.077, an equivalent of 7.7%. This was an indication that Industry characteristics had a moderating effect on product development strategy.

ANOVA results on the other hand revealed that following introduction of the moderator, the model was statistically significant at a F-statistic of 61.152 and a P-value of 0.000<0.05. This led to the decision to reject the null hypothesis of the study that industry characteristics has nosignificant influence on product development strategy and competitiveness of ISO Certified Manufacturing firms in Kenya.

The regression coefficients are also as shown. From the coefficients, the new model now became:

$Y=0.325+ 0.095X_2+0.224$

The findings implied that the moderator (Industry characteristics) had a moderating effect on the relationship between product development strategy and competitiveness of ISO-certified manufacturing firms in Kenya. However, the findings revealed that industry characteristics had no direct relationship with competitiveness of ISO-certified manufacturing firms in Kenya. The P-value under the regression coefficients also revealed that the influence of industry characteristics on the relationship between product development strategy and competitiveness of ISO-certified manufacturing firms was insignificant.

The study findings agreed with Hermundsdottir and Aspelund (2021) who did research on sustainability and firm competitiveness in order to identify factors that mediate/moderate the interconnection. The study established that national market, industry and firm-level factors have a moderating effect on the relationship. In conclusion, the study established that industry characteristics can moderate the relationship between sustainability innovation and competitiveness.

Additionally, inferential statistical findings agreed with Iyer et Al. (2020) who conducted a meta-analytic review of impulse buying to try to understand the relationship between impulse buying and its determinants. The study sought to examine industry characteristics as a contextual moderator in the study. Iyer et Al. (2020) employed industry characteristics as a moderator to the study. However, the point of divergence from this study was that, while Iyer et Al. (2020) established industry characteristics as a moderator in the study, with identity, price levels, advertising and distribution intensity being the sub-constructs. This study employed different understudies for industry characteristics when examining it's moderating role on product development strategy and competitiveness.

Conclusion of the Study

The study concluded that product development strategy influences competitiveness of ISO certified manufacturing firms in Kenya. Product development strategy has significant influence on competitiveness of ISO-certified manufacturing firms in Kenya.

The study also concluded that industry characteristics has a moderating influence on the relationship between product development strategy and competitiveness of ISO-certified manufacturing firms in Kenya.

The study recommendations were in line with the objectives, findings and conclusions. It was recommended that manufacturing firms in Kenya should have a product development strategy in

place as this enhances firm competitiveness. The study also recommended that in future, scholars and researchers could aim to test the relationship between product development strategy and firm competitiveness using different sub constructs to bring rigour and offer platforms for comparison of findings.

Contribution of the Study to Theory and Existing Knowledge

The study developed a conceptual framework underpinning future research work on product development strategy and competitiveness of ISO-certified manufacturing firms in Kenya. The study successfully tested the hypothesis related to the original conceptual framework developed in chapter two. The study contributed to the prioritisation of product development strategy as an avenue for the realization of competitiveness.

The majority of extant studies the researcher reviewed and cited in the empirical review are based on competitive advantage and performance. Not much was found to have been undertaken on competitiveness, more so from a regional perspective.

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Appendix II: ISO Certified Manufacturing Firms in Kenya
Source: KEBS, 2023

#	Organization	Location
1	East African Maltings Ltd	Nairobi, Kampala Road
2	Kenya Breweries limited	Nairobi, Thika Road, Garden City
3	New KCC – Dandora	Nairobi, Dandora
4	Trufoods Limited	Nairobi, Jogoo Road
5	New KCC - Cheese factory	Nairobi, Dakar Road, Industrial Area
6	Sous Chef Limited	Nairobi, City Park Drive, Parklands
7	Bidco Africa -Noodle Pant	Thika
8	Del Monte Kenya Limited	Thika
9	Golden Africa Limited	Athi River
10	New KCC - Kiganjo Factory	Nyeri
11	New KCC - Nyahururu Factory	Nyahururu
12	Kenya Tea Packers	Kericho
13	New KCC - Eldoret Factory	Eldoret
14	New KCC-Kitale Factory	Kitale
15	Kipkebe Tea Factory	Sotik
16	New KCC- Sotik	Sotik
17	Keritor Factory	Nyamira
18	Kipchabo Tea Factory Limited	Kapsabet
19	New KCC – Miritini	Mombasa
20	ASP Company Ltd	Nairobi, Embakasi Road
21	Steel Structures Limited	Nairobi, Kangundo Road, Umoja 2
22	Ardagh Glass Packaging Kenya (Formerly Consol Glass Kenya Ltd)	Nairobi, Kasarani
23	Nairobi Bottler Limited-Preform Plant	Nairobi, Umoja 2
24	Cylinder Works Limited	Ruiru, Exit 11Ruiru Town, Devki Street
25	Bidco Africa beverage and plastics plant	Thika
26	Almasi bottlers limited	Nyeri
27	Equator Bottlers Ltd	Kisumu
28	Afrimac Nut Company Limited	Shivachi Rd, Parklands, Nairobi.
29	East Africa Portland Cement Public Limited	Athi River, Machakos County, Kenya
30	Golden Africa Kenya Limited	Liberty Plaza, Mombasa Rd, Nairobi.
31	Goshen Farm Exporters Limited	Nairobi
32	Isuzu East Africa Limited	Enterprise Rd, Nairobi
33	Joopers Busy Limited	Kisumu, Kenya
34	Laikipia Permaculture Centre Limited	Nanyuki, Kenya
35	Orchard Juice Limited	Nairobi, Kenya
36	Osho limited	Nairobi, Kenya
37	Raka milk processors	Nyeri
38	Sarjim Holdings Limited	Nairobi, Kenya
39	Tropikal Brands	Nairobi, Kenya
40	Vert Limited	Nairobi, Kenya
41	Vokenel Enterprises Limited	Nairobi, Kenya