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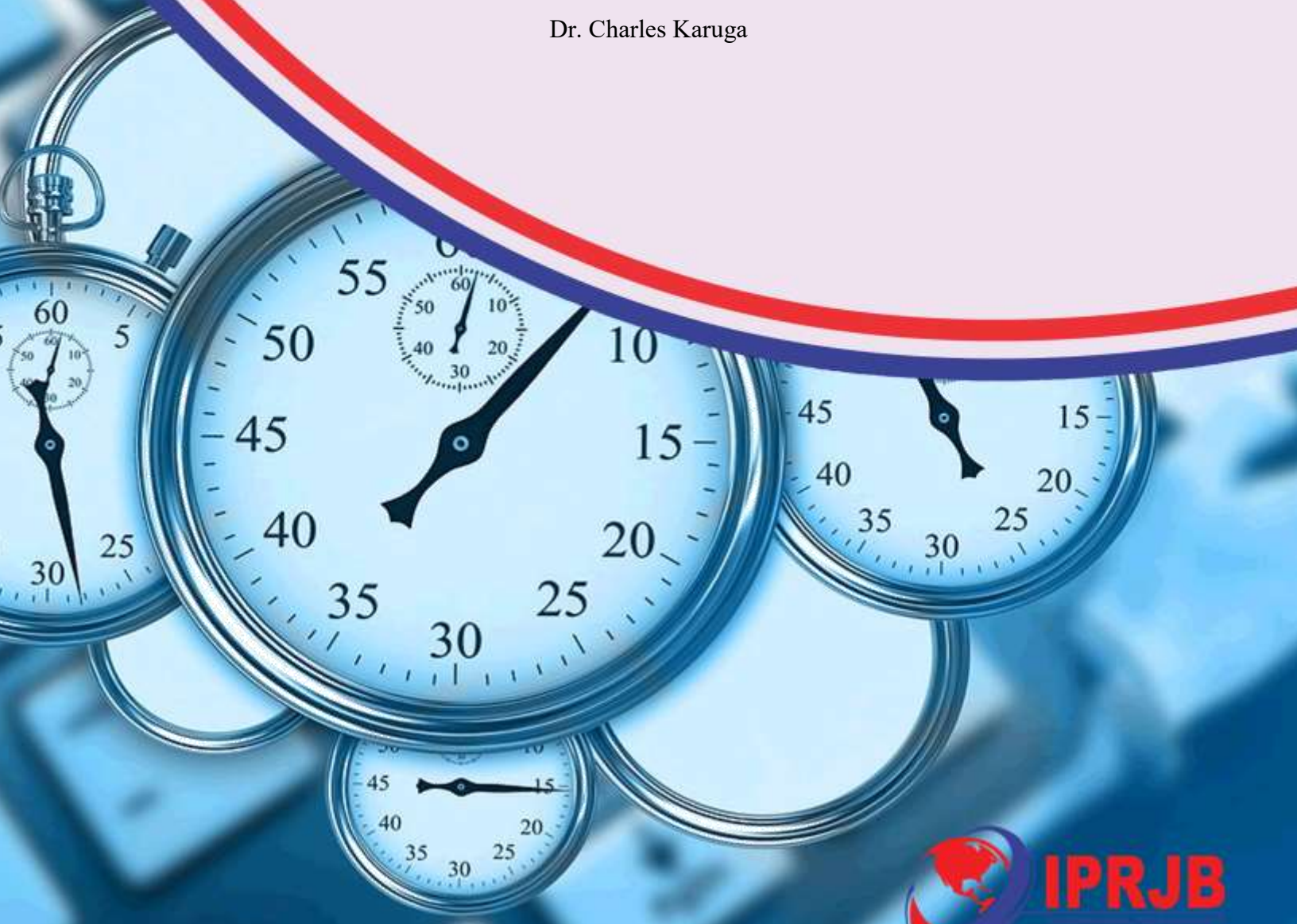
Influence of Infrastructural Choices Strategy on Organizational Performance of Cement Manufacturing Firms in Kenya

Dr. Charles Karuga



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[1*]Dr. Charles Karuga
Mount Kenya University

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Abstract

Purpose: To determine the influence of infrastructural choices strategy on organizational performance of cements manufacturing firms in Kenya.

Methodology: A mixed methods approach was used in the investigation. The study utilized a concurrent triangulation research design. The unit of analysis comprised of seven (7) cement manufacturing firms, targeting all the 4192 employees from where a sample size of 365 employees was drawn. The data collection tools comprised of semi-structured questionnaires and interview guides. The interview guide was administered to the CEOs while the questionnaires were administered to the managers and non-managers. The study tools were piloted to assess their validity and reliability. The data was then analyzed both descriptively and inferentially using SPSS version 27. Quantitative data was analyzed using means and standard deviations while qualitative data was analyzed using content analysis. To make the number of variables more manageable, the data was subsequently subjected to exploratory factor analysis.

Findings: The results of the study revealed that infrastructural choice strategies have been employed by cement manufacturing firms to a good extent. The regression results obtained also led to the rejection of the null hypotheses since infrastructural choice strategies were found to have a positive and significant influence on organizational performance.

Unique Contribution to Theory, Policy and Practice: The study recommended, based on these results that the management of individual cement firms need to identify appropriate infrastructural choice strategies and leverage on them in order to achieve efficient and effective utilization of their scarce resources at organizational level.

Keywords: *Infrastructural Choices, Strategy, Organizational Performance, Manufacturing Firms*

INTRODUCTION

Cement is a crucial material in construction, forming concrete and mortar, and is essential for global infrastructure. The world consumes over 4 billion tons annually, contributing 5.4% to global GDP and 7.7% to world employment (CemNet 2020). As urbanization rises, cement's role in meeting housing needs remains critical (Schneide, Rome, Tschudin, & Bolio, 2011).Kenya, with a population of 53.5 million, aims to become a middle-income country by 2030. Recent reforms have boosted infrastructure projects, leading to increased cement production, which rose from 5.97 Mt/a in 2019 to 6.55 Mt/a in 2020. Cement consumption grew by 20.3%, with a capacity utilization rate of 58.0%, surpassing the African average. The construction sector grew by 11.8% in 2020 (KNBS Economic Survey, 2022).

Hallgren (2016) suggests that operations strategies offer companies a systematic approach to decision-making, aiding in wealth creation, competitiveness, and long-term performance. These strategies address both current and future challenges posed by competitive environments by developing operations resources and policies to maintain a competitive edge (Veiga et al., 2022). Espino-Rodríguez and Gil-Padilla (2015) argue that operations strategies not only form the basis for long-term competitive advantage but also enhance resource organization and productivity. Initially, operations strategies focused on the finance and marketing divisions of manufacturing organizations (Gong, 2013).

Organizational performance is often assessed through efficiency and effectiveness, with efficiency focusing on maximizing output with minimal expenditure (Mouzas, 2006; Mayer, 1985). Efficiency contributes to success in management, production, and profitability but isn't the sole market performance indicator (Kumar & Gulati, 2010). Operations strategy, aligning resources with corporate goals, is crucial for long-term competitiveness (Boyer, Swink, & Rosenzweig, 2015). Underutilization due to rigid structures hampers manufacturing firms' performance (Nangulu, 2018; Olhager, Rudberg, & Wikner, 2017).

Tajeddini and Kayhan (2015) analyzed the influence of entrepreneurial and financial orientations on the performance of 182 Swiss hotels, focusing on efficiency and effectiveness. Zelbst et al. (2012) investigated the impact of RFID technology on manufacturing firms' efficiency and effectiveness. Daraio et al. (2016) employed a 3D fuzzy logic methodology to assess knowledge management systems in SMEs. Bals and Turkulainen (2017) explored how Purchasing and Supply Management (PSM) design affects outsourcing efficiency. Malonza (2014) and Odollo (2019) emphasized operational performance, with Odollo using the OPMM model. Kenya's cement market growth is fueled by infrastructure investments (Bamburi Cement Annual Report, 2021).

Kenya's cement market growth is fueled by infrastructure investments and a rebound in the individual house builders segment (Bamburi Cement Annual Report, 2021). The manufacturing sector, including cement, contributed 7.2% to Kenya's GDP in 2021 (KNBS, 2022). Despite robust growth, challenges like clinker shortages, high electricity costs, and expensive coal imports persist (Anyanzwa, 2021; Nyawira, 2010). Kenyan cement firms have adopted strategic operations to maintain competitiveness (Meroka & Nyamwange, 2013; Kasongo & Misango, 2019).

Objectives of the Study

The general aim of the study was to determine the influence of infrastructural choices strategy on organizational performance of cements manufacturing firms in Kenya.

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LITERATURE REVIEW

Theoretical Review

Operations Content model

Operations Content model can be traced back to Slack and Lewis (2009), who coined a model to define how decision areas within which manufacturing firms implement strategies. By advancing drivers of performance from the content model of operations strategy, the components of an operations strategy are described by Slack and Lewis (2009) as competitive priorities and decision categories (areas). Operations strategies were further categorized into structural decisions and infrastructural choices by Sciuto and Filho (2013) and Gong (2013). (Figure 1)**.** According to Boyer, Swink, and Rosenzweig (2015), operations strategies are a collective set of decisions and plans that are agreed upon and involve creating and coordinating managerial strategies for the restricted resources in an effort to match them with the overall business strategy. Hence operations strategies focus on firm's competitive competences in the long term. Using a model developed by Ketema (2015), operations strategies are operationalized as competitive priorities, structural decisions, and infrastructure choices**.**

Operations strategy form very precise choices of actions which establishes the processes roles, purposes and undertakings of companies (Ketema (2015). In order to assess their effect on the performance of cement producers in Kenya, the research will focus on the competitive priorities, structural decision categories, and infrastructure decisions that make up the operations content model, as shown in figure 1.

Anchored on this assertion, the current study is predicated on the Operations Content Model (OCM), which creates the study variables and subsequently the study objectives.

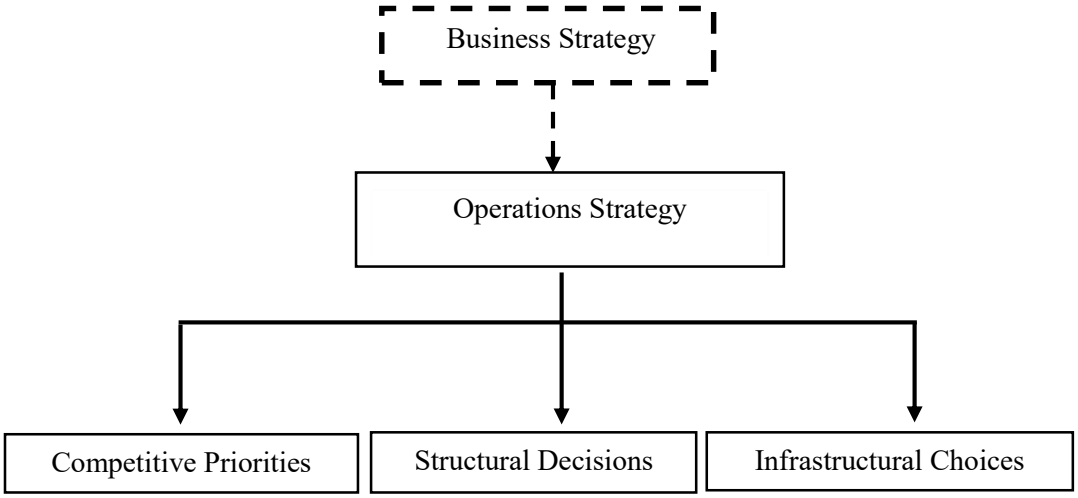

Figure 1: Operations Content Model

Source: Adopted from Odollo (2019)

The model states that structural decision is related to tangible features of firms' amenities; equipment's and employees. Structural decisions of are decisions where a manufacturing firm is mainly concerned with the capacity, processes and structure of operations of a manufacturing firm. Fundamentally, the strategies employed by the cement manufacturing companies determine how

long they will survive and thrive in their current operating environment. Structural decisions in a number of times involve large amounts of capital investment decisions and once the investment is made, it becomes the basis upon which the directions of operations and interactions within a firm are made.

Conceptual Framework

A conceptual framework represents a diagrammatic relationship between the dependent and the independent variables (Kothari, 2004).

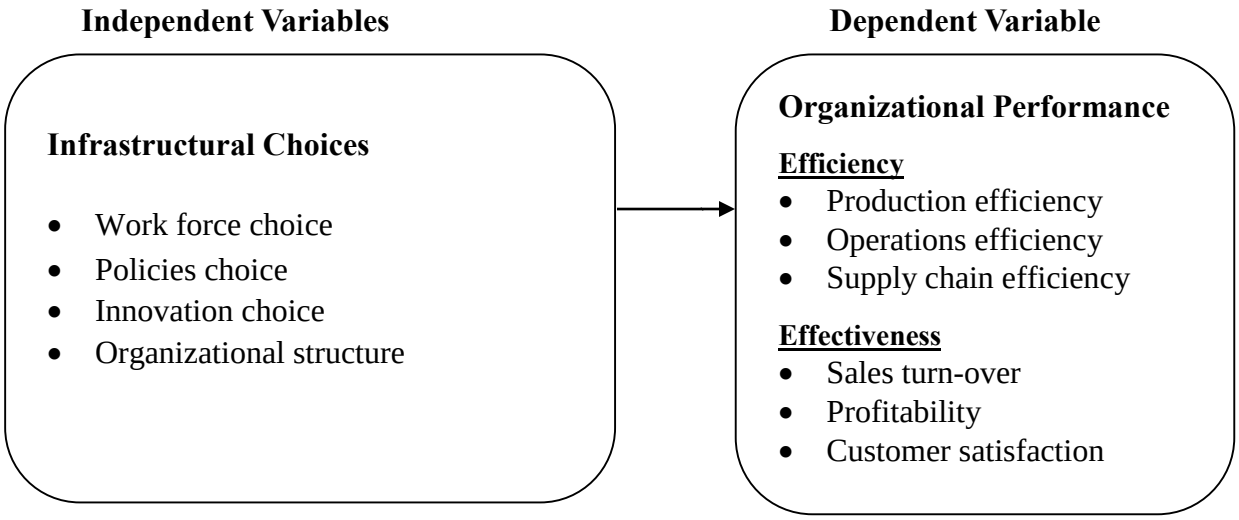

Figure 1: Conceptual Framework

Source: Researcher, 2023

Empirical Literature review

Gong (2013) made the case that manufacturing companies want to locate and eliminate the sources of manufacturing errors and minimize changeability in the manufacturing process before building the groundwork for an expansion of low-cost and high-quality capabilities in the future.

Luger et al. (2013) investigated 500 UK manufacturing firms using a 2-step methodology, revealing infrastructure choice as the third key component of competitiveness. However, its significance varied due to demographic and business mix diversity. Contrastingly, Odollo (2019) found that infrastructural decisions significantly impacted the performance of the sugar industry in Kenya, highlighting their importance in policy considerations.

Wamalwa et al. (2014) found that Mumias Sugar Company's delivery strategies significantly improved factory time efficiency, based on data analyzed through descriptive and inferential statistics from structured questionnaires.

METHODOLOGY

The study used Positivism philosophy. The target population was 7 cement manufacturing companies in Kenya. This analysis was conducted to the 7 because according to Ministry of Industrialization (2019), there are eight (8) cement manufacturing companies in Kenya. However, Savannah cement ltd was left out because by the time of data collection, it had been "temporarily"

shut down. Concurrent triangulation was used in the study's research design. Both primary and secondary sources were used to gather data for this study, and both quantitative and qualitative data gathering techniques were employed. Using a questionnaire and interview schedule for main data collection and a secondary data collection sheet for secondary data collection, the study's data was gathered.

The data was processed and analyzed using MS Excel 2016 and IBM's SPSS version 28. The qualitative data was analyzed using content analysis technique. Descriptive statistics of the data was tallied in the form of means and standard deviations. Inferential statistics was carried out using the Pearson's Product Moment Correlation analysis (r) to draw the line of best fit for the data set of independent and dependent variables and also made use of hierarchical regression analysis to determine the significance of the interaction between the moderating variable (firm characteristics) and the independent variable (operation strategies) in relation to the dependent variable. This included correlation tests and regression analyses where the analysis used r, p, β, and F values (set at 0.05 (95% confidence interval) to establish the respective relationships. The study outcomes were presented in tables, correlation and regression results tables.

RESULTS

Response Rate of the Research Instrument

The study sample for the study incorporated 359 respondents who comprised of managers and non-managers of the Cement Companies. A total of 359 questionnaires were issued to the respondents and a total of 258 questionnaires were recollected for analysis. This makes a response rate of 71.87% which was considered adequate for analysis. This represented a response rate of 81%. Kartono and Rusilowati (2019) noted that a response rate of above 50% is adequate for a descriptive study and acceptable for analysis and publication, while responses above 60% are considered excellent.

Table 1: Response Rate

Response Rate	Frequency	Percent
Returned Questionnaires	258	71.87%
Unreturned Questionnaires	101	28.13%
Total	**359**	**100%**

Descriptive statistics

The respondents were required to indicate whether they agree or disagree with the following statements relating to differentiation strategy. The results are as shown below.

Table 2: Infrastructural Choice Strategy

Variables	Strongly disagree	Disagree	Moderately agree	Agree	Strongly agree	Mean	Std. Dev
The cement work force is empowered to make decisions regarding their set goals.	5.04%	14.34%	16.67%	38.76%	25.19%	3.65	1.15
The work force team is trained and prepared to take accountabilities that help attain their set goals.	7.36%	11.24%	20.16%	30.23%	31.01%	3.66	1.23
The workforce has precondition competence associated to the tasks undertaken by the team.	6.98%	13.57%	16.28%	35.27%	27.91%	3.64	1.22
The operating policies and procedures approved by management are supportive to achieving set objectives.	7.75%	12.02%	14.73%	34.50%	31.01%	3.69	1.24
The administration encompasses employees in the setting of policies.	8.14%	10.47%	14.34%	38.37%	28.68%	3.69	1.22
The formalization of work measures is highly formalized in the cement firm.	5.81%	11.63%	15.12%	35.27%	32.17%	3.76	1.19
There is continued automations in the manufacturing process in the cement firm.	6.20%	8.91%	14.34%	38.37%	32.17%	3.81	1.16
There is employee encouragement to engage in innovation process in our cement firm.	5.04%	9.69%	14.73%	36.82%	33.72%	3.84	1.14
There is lots of innovations in the manufacturing process in our firm	3.88%	8.14%	18.22%	35.27%	34.50%	3.88	1.09
Authorization resides in the high chain of command	6.59%	11.63%	16.28%	33.33%	32.17%	3.73	1.21
The management structure is decentralized	6.59%	12.02%	15.50%	34.88%	31.01%	3.72	1.21
The operations is divided into areas of specialization	12.40%	13.18%	17.05%	31.40%	25.97%	3.45	1.33
Overall Mean						**3.71**	**1.20**

Source: Researcher (2023)

The findings from Table 32 reveal that 84.11% of respondents believe the cement workforce is empowered to make decisions, with a mean of 3.65 (S.D = 1.15). Additionally, 81.4% agree on workforce training for accountability (mean = 3.66, S.D = 1.23), and 79.46% acknowledge workforce competence (mean = 3.64, S.D = 1.22). High agreement (80.24%-85.27%) was noted

on supportive policies, engagement in policy setting, and innovation, with means ranging from 3.69 to 3.88 (S.Ds = 1.09-1.24).

Furthermore, the respondents were also asked to indicate the extent to which their firm have made improvements in particular areas regarding infrastructural decision strategy. They were also requested to use the scale of; **1= 1-3%, 2= 4-6%, 3= 7-9%, 4= 10-12%, 5= Over 12%** to show their level of agreed with the statements.

Table 3: Infrastructural Choice Strategy

Variables	1-3%	4-6%	7-9%	10-12%	Over 12%	Mean	Std Dev
Increase in workforce training programs	13.18%	16.28%	17.05%	27.52%	25.97%	3.37	1.37
Increase in budget for formalization workshops	16.67%	18.99%	14.34%	21.32%	28.68%	3.26	1.47
Increase in automations	14.73%	18.22%	17.44%	24.81%	24.81%	3.27	1.4
Improvement in management structures	13.77%	14.34%	19.34%	30.07%	22.48%	3.2	1.45
Overall Mean						**3.28**	**1.42**

Source: Researcher (2023)

Table 3 findings show significant increases in workforce training, automation, and management structure improvements, with mean values from 3.2 to 3.37, supported by CEO interviews and Luger et al. (2013).

Correlation Analysis

The study focused on assessing the relationship that exists between infrastructural choice strategy and organizational performance.

Table 4: Correlation tests of Infrastructural Choice Strategy

		Mean customer focus	Mean financial performance
Mean infrastructure strategy	Pearson Correlation	1	.757**
	Sig. (2-tailed)		.000
Mean financial performance	Pearson Correlation	.757**	1
	Sig. (2-tailed)	.000	

**. Correlation is significant at the 0.01 level (2-tailed).

The results also found that infrastructural choice strategy had a positive and significant association with organizational performance (r=0.757, p=0.000). The correlation results of the study by Wamalwa et al., (2014) also revealed that infrastructural decisions have a positive and significant relationship with operational performance.

Regression Analysis

Regression analysis was done to determine the the influence of infrastructural choices strategy on organizational performance of cements manufacturing firms in Kenya.

Table 5: Model fitness

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.886a	0.618	0.616	0.192432

a Predictors: (Constant), Av_competitive priorities strategy

Source: Researcher (2023)

The model summary revealed that competitive priorities strategy accounts for 61.8% of the variations in organizational performance, indicated by an R-square of 0.618, validating its significance in Kenyan cement firms.

Table 6: ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	15.325	1	15.325	413.862	.000b
	Residual	9.48	256	0.037		
	Total	**24.805**	**257**			

Source: Researcher (2023)

ANOVA confirmed the regression model's significance, with competitive priorities strategy effectively predicting organizational performance ($F = 413.862$, $p = 0.000 < 0.05$) at a 95% confidence interval.

Table 7: Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.139	.035		89.494	.000
	Mean infrastructure strategy	0.197	.01	.886	20.344	.000

a. Dependent Variable: Mean financial performance

Source: Researcher (2023)

Regression of coefficients results in Table 6 revealed that infrastructural choices strategy and organizational performance are positively and significantly related ($\beta = 0.197$, $p=0.000$). This implies that a unit increase in customer focus strategy would lead to increase in financial performance by 0.913.

The regression model for this coefficient would be;

$Y = \beta_0 + \beta_1 X$ ……. Equation 1

Where **Y** = organizational performance

$\beta_0 = 3.139$,

$\beta_1 = 0.197$

X= infrastructural choices strategy

$Y = 3.139 + 0.197X$ ……. Equation 1

CONCLUSION AND RECOMMENDATIONS

Conclusion

The study concluded that infrastructural choice strategy significantly enhances organizational performance in Kenyan cement manufacturing firms. A unit increase in this strategy results in a 0.191 unit performance boost. Among the components, policy choice had the greatest impact (β=0.219), followed by workforce (β=0.21), innovation (β=0.212), and structure (β=0.194). Empowering employees and aligning policies with firm objectives were critical for effective decision-making and leadership.

Recommendations

The study recommends that cement manufacturing firms in Kenya invest in automated systems for production and delivery to enhance efficiency. Improved training programs for employees and advancements in production technology are also advised. Additionally, decentralizing management structures and specializing departments can boost managerial efficiency. Policymakers should develop better policies on employee motivation and competitiveness, aligning with firms' objectives and goals to support overall performance.

REFERENCES

Anyanzwa (2021). Kenyan Cement Makers Suffer Clinker Shortfall. The East African. https://www.theeastafrican.co.ke/tea/business/kenyan-cement-makers-suffer-clinker-shortfall3580302#:~:text=Kenya's%20cement%20manufacturing%20sector%20is,Committee%20released%20last%20week%20showed.

Boyer, Swink and Rosenzweig (2015): Operations Strategy Research in the POMS Journal. *Production and operations Management Society., 14*(4), 442 - 449. Retrieved February 14th, 2016, from www.msu.ed/osr_emory.pdf

CemNet. 2020. "Impact of COVID-19 on the Cement Industry." Live Webinar presented at the CemTech International Cement Conference, April 15. https://www.cemnet.com/Conference/ Item/185258/impact-of-covid-19-on-the-cement-industry-live-webinar.html.

Creswell, J. W. (2016). *Research Designs: Quantitative, Qualitative and Mixed Method Approaches.* (2nd ed.). (C. D. Laughton, Ed.) London, California, United Kingdom: Sage Publications, Inc.

Espino-Rodríguez, T. F., & Gil-Padilla, A. M. (2015). The structural and infrastructural decisions of operations management in the hotel sector and their impact on organizational performance. Tourism and Hospitality Research, 15(1), 3-18.

Gong, Y. (2013). *Global Operations Strategy: Fundamentals and Practice. Springer Texts in Business and Economics, .* Ecully., France.: Springer.

Gujarati, D. N. (2014). *Basic Econometrics.* (4Th. ed.). McGraw-Hill. Hall.

Hallgren, M. (2016, Spring 2). Manufacturing Strategy, Capabilities and Performance. (UniTryck, Ed.) *Linköping Studies in Science and Technology, 1*(1), 1 - 33.

Kasongo, P., & Misango, S. (2019). Effects of Generic Competitive Strategies on organizational performance in the Manufacturing Industry: a case of Bamburi Cement Limited, head office, Nairobi. *International Journal of Economics, Business and Management Research*, *3*(2).

Kenya National Bureau of Statistics (2020): *Economic Survey.* Nairobi: Republic of Kenya.

Kenya National Bureau of Statistics (2021): *Economic Survey.* Nairobi: Republic of Kenya

Kenya National Bureau of Statistics (2022): *Economic Survey.* Nairobi: Republic of Kenya

Ketema, G. B. (2015). *Drivers of Manufacturing Performance in Medium and Large Scale Firms in Ethiopia (Evidence from Addis Ababa and its Periphery).* UNISA, Business Leadership. UNISA. Retrieved 13th January 2017 from uir.unisa.ac.za/handle/10500/19199

Ketema, G. B. (2015). *Drivers of Manufacturing Performance in Medium and Large Scale Firms in Ethiopia (Evidence from Addis Ababa and its Periphery).* UNISA, Business Leadership. UNISA. doi:45682747

Kothari, C. R. (2010). *Research Methodology: Methods and Techniques.* (2nd ed.). New Delhi, Jaipur., India: New Age International (P) Ltd. Retrieved April 2016, from www.newagepublishers.com

Kothari, C. R. (2016). *Research Methodology: Methods and Techniques.* (2nd ed.). New Delhi, Jaipur., India: New Age International (P) Ltd. Retrieved April 2016, from www.newagepublishers.com

Kumar, R. (2018). *Research methodology: A step-by-step guide for beginners*. Sage.

Mayer, R. R. (1985). *Policy and program planning: A developmental perspective*. Prentice

Merora, J. N. (2011). Manufacturing Strategy in Small and Medium Scale Enterprises in Kenya. Unpublished MBA project, University of Nairobi.

Nangulu, E. (2018). Capacity Management Strategies and Operational Performance of Sugar Manufacturing Firms in Kenya. Unpublished MBA Thesis in the School of Business, University of Nairobi.

Odollo, L. O. (2019): Effect of Operations Strategies on the Performance of Sugar Manufacturing Sector in Kenya. International Journal of Management Science. 4 (3), 136 – 145.

Schneider, M., Romer, M., Tschudin, M., & Bolio, H. (2011). Sustainable cement production—present and future. *Cement and concrete research*, *41*(7), 642-650.

Sciuto, J. M., Filho, A. G. A. (2013). Operation Strategy and Lean Manufacturing: A Study in A Metallurgical Company. *International Conference on Industrial Engeneering and Operations Management.* (pp. 1 - 8). Valladolid, Spain.: ICIEOM. Accessed on 13th October, 2017 from www.abepro.org.br/biblioteca/icieom2013_tn_sd_170_975_23376.pd

Slack, N. &. Lewis, M. (2011). *Operations Strategy.* (4th. ed.). Prentice Hall.Accessed on 27th January, 2017 from www.amazon.com/Operations-Strategy-4th-Nigel-Slack/dp/1292017791

Veiga, G.L., Pinheiro de Lima, E., Frega, J.R. and Gouvea da Costa, S.E. (2022), "Definition of input and output variables to assess operations strategy efficiency frontier", *International Journal of Productivity and Performance Management*, Vol. 71 No. 2, pp. 598-642. https://doi.org/10.1108/IJPPM-11-2019-0540

Zelbst, P. J., Green, K. W., Sower, V. E., & Reyes, P. M. (2012). Impact of RFID on manufacturing effectiveness and efficiency. *International Journal of Operations & Production Management*.