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Infrastructural Manufacturing Strategy Decisions, Core Competences and Operational Performance of Food Processing Companies in Cameroon; Based on the Partial Least Squares Approach to Structural Equation Modeling

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ABSTRACT:

This paper focused on the interrelationship between infrastructural manufacturing strategy decisions, core competences and operational Performance of food processing companies in Fako division and Littoral Region, Cameroon. The fouth objective of the study was to examine the mediating effects between infrastructural decisions, core competence and operational performance of food processing firms in fako and Littoral region of Cameroon as used by Barron and Kenny (1986). The research questions and hypothesis were formulated to work with the research objective. A causal and survey research design was adopted for the study and a sample size of 339 respondents was drawn from the population of 724 food processing firms. The major instrument for data collection was a semi structured questionnaire administered to the respondents using a five Lickert scale for proportionate representation from the population. The data collected was analysed using partial least square structural equation modeling and partial least square path modeling. Results showed that core competences dimension (technical skills, administrative skills, cognitive skills, allocation and transactional competence) partially mediates the relationship between infrastructural decisions and operational performance at 0.05 level of significance and 95% confidence level. Based on the findings of the analysis, the study concludes that, the dimensions of infrastructural decisions (resources management, cost and quality management, inventory management, supply chain and distribution) are relational aspect that affects operational performance. Consequently, it is recommended that every organisation should be empowered with these dimensions of infrastructural decisions to help them navigate complex and ever-changing business environment successfully and to improve overall operational performance.

KEYWORD: manufacturing strategy decisions, infrastructural decisions, core competences and operational performance.

1.1 Background to the Study

During the 1980s, manufacturing companies in the United States of America rediscovered the power that comes from superior manufacturing and initiated a variety of activities to improve their competitiveness. Many announced that their "manufacturing strategy" was to become "world-class "as good, along various measures, as the best companies in their industries. In pursuing this goal, they typically adopted one or more of a growing number of improvement programs, such as TQM (Total Quality Management), JIT (Just-in-Time) production, and DFM (Design for Manufacturing), not to mention lean manufacturing, reengineering, benchmarking, infrastructural decisions, infrastructural development, and the global team approach (Heinzmann and Maria, 2013).

According to Gunasekaran and Dohale (2021), Skinner in 1969, challenged Taylor's assertion that there was one best way to manufacture in his now-classic article, companies have different strengths and weaknesses and can choose to differentiate themselves from their competitors in different ways to secure and maintain customers while ensuring increase in sales and profitability which are operational performance dimensions.

In Cameroon, there has been a minimal growth in the number of food processing companies especially in the city of Douala where many organisations and business companies have their head offices, and Buea which is the headquarter of south west region. This is largely attributed to the modern trend of information research being relied upon in many establishments of different institutions as well as expansionary policies adopted by the Government (Cheruiyot, 2011). This sector is estimated to contribute approximately 51% of the country's GDP. Like the rest of the world, Cameroon food processing industry is dominated by foreign food processing companies (Mungai, 2012). According to Aaker 2012, Most of the resident food processing firms continually face financial uncertainty, poor turnover levels, poor reputation, poor leads from customers, inadequate skills and resources and often have little experience compared to their foreign counterpart, making a lot of Cameroonians to depend more on unprocessed foods directly from the farms. For this reason, many new food processing companies begin operations every year and hardly close down their operations since food is a basic necessity.

1.2 Statement of the Problem

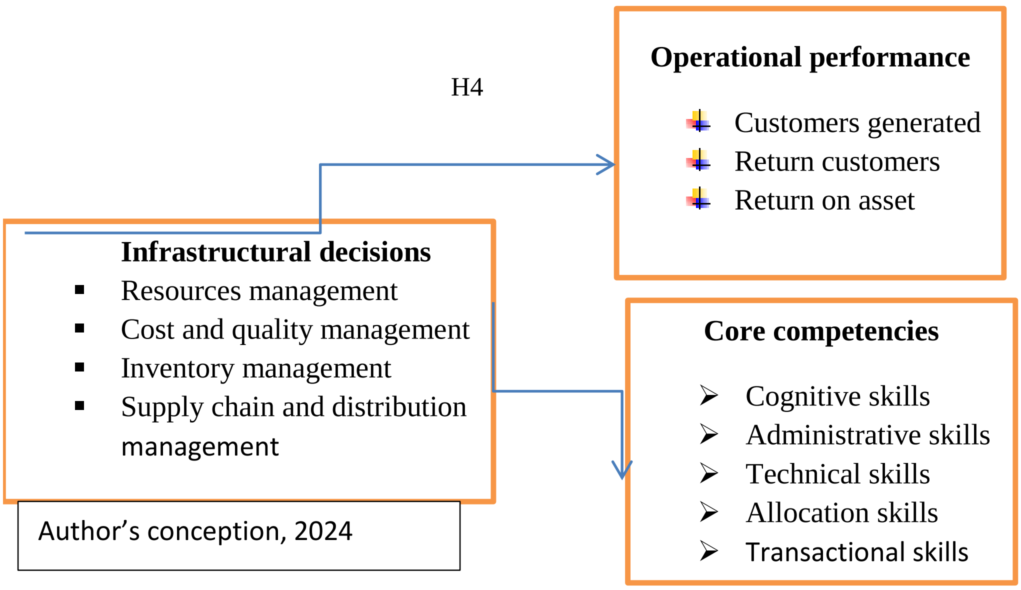
The essence of operational performance is the creation of value by generating customers, ensuring customers return to buy and to avoid return inwards from customers. Thus, putting in place good structural and infrastructural decisions in manufacturing generates equal to or greater value than expected, to achieve the objectives of the firm. Also, the global and predominant goal of any company is long term survival and the ability to produce useful and sustainable outputs. In manufacturing companies, the outputs are usually products offered to customers resulting in profits divided by its owners' called shareholders in the form of dividends. Production is concerned with how manufacturing companies deploy scarce resources into the process of changing the form of inputs to useful outputs called finished products (Barney 1991). In the process of production, manufacturing strategy offers an organised, planned and controlled approach to decision making in simplifying an economic manufacture.

Despite the successes of the government and donor agencies in the improvement of production systems through research, a research carried out by festus (1993) revealed that there is persistence increase in post-harvest losses of food crop in Cameroon. This is attributed to inappropriate harvesting techniques, poor and limited transportation systems, rudimentary storage technologies, inventory system, inefficient processing, inefficient resources management and packaging technologies.

Processing technologies that exist in Cameroon for the transformation of cereal, grain, legumes, roots, tubers and leafy vegetables into a broad variety of locally manufactured products include drying, milling and fermentation. These technologies are rudimentary in Cameroon leading to inconsistency in production and unhygienic products. Access to improved technologies is limited by inadequate capital and information. However, some private institutions utilize improved technologies in oil processing, rice and corn milling and fruit processing.

Numerous lacks are found in the transportation sphere of the processed foods marketing system of Cameroon. A few good roads link up the urban areas but farm to market roads are both unpaved and poorly maintained. In the rainy season particularly, regular market connections are hard to establish between most parts of the country due to poor road infrastructure. Also, means of transportation such as vehicles are inadequate and unreliable. Consequently, in most cases transportation is a major marketing cost component. It accounts for about 50% of the total marketing costs and in some cases up to 70% especially as production and consumption areas are separated by long distances.

2.1 Conceptual review:



Author's conception, 2024

From the conceptual framework above, manufacturing strategy decisions is the independent variable which was operationalised with use of the following indicators: infrastructural decisions categories. The operational performance of the firm is the dependent variable and was operationalised through number of customers, number of products bought by a customer, number of repeat purchase from customers. The concept of core competences was the mediating variable which was operationalised through cognitive skills, technical skills, administrative skills, transactional skills, and allocation skills (Njina, 2018). The control variables used include, the sector of activity, age of the firm, size of the firm, experience and level of education.

2.2 Theoretical Review

The main theories used are the resource based view theory (Barney, 1991) and core competency theory (Prahalah and Hamael 1990).

2.2.1 Resource-Based View (RBV) Barney (1991)

Resource-Based View (RBV) was first put forward by Penrose (2009), who proposed a model on the effective management of firms' resources, diversification strategy, and productive opportunities. Penrose's publication was the first to propose conceptualising a firm as a coordinated bundle of resources to address and tackle how it can achieve its goals and strategic behaviour (Penrose, 2009). RBT began to take shape in the 1980s.The antecedent of RBT was the Theory of the Growth of the Firm. Later, during the 1990s, Jay Barney's work was critical to the emergence of RBT and became the dominant paradigm in strategic management and strategic planning.

The Resource-Based View (RBV) of the firm initiated in 1980s by Wernerfelt (1984), Rumelt (1984) and Barney (1991) has become one of the dominant contemporary approaches to the analysis of sustained competitive advantage and its implication on firm performance. The RBV posits that the possession of key resources together with their effective development and deployment enables organisations to achieve and sustain competitive advantage. It focuses on the relationship between firm's resources and performance and helps to address the question why firms in the same market environment perform differently (Jena, 2008). According to RBV assets with certain characteristics will lead to sustainable advantage and therefore high strategic returns in terms of market share or profits. However, a resource-based view strategy cannot provide competitive advantage without being operationalised (Barney, 2014). The operationalisation of RBV theory is fundamental because it directs managers in their resource-based strategy implementation. The RBV theory is based on two critical assumptions; that resources must be heterogeneous and immobile. However, these assumptions are only necessary but not sufficient conditions in gaining competitive advantage, the resources must in addition be valuable in a way that delivers value to the firm and rare so as to deliver a unique strategy compared to other firms in the industry. Moreover, resources must be inimitable in that it should not be possible for the competing firms to imitate nor obtain the resource and non-substitutable such that there must be no strategically equivalent valuable resources that other firms can easily acquire (Bowman & Ambrosini, 2003).

2.2.2 Core Competency Theory

This theory was developed by Prahalad & Hamel (1990) who pioneered the concept and laid foundation for companies to follow in practice. The concept of core competence was first introduced by C.K. Prahalad and Gary Hamel in 1990, in their article "The core Competence of the Corporation". Also known as core competence model, this theory is a strategy framework that starts the strategy process by thinking about the core strengths of business and prescribes actions to be taken by organisations to achieve competitive advantage in the market place. Prahalad and Hamel (1990) proposed a different approach to strategic planning, not to replace the traditional planning process but to supplement it. It starts with internal analysis and then examines the external environment. The authors suggested that companies need to understand fully their core competencies and capabilities in order to successfully exploit their resources.

In their view a core competency is a specific factor that a business sees as central to the way the company or its employees work. It fulfils three key criteria or assumptions:

(1)It is not easy for competitors to imitate. (2)It can be reused widely for many products and markets. (3)It must contribute to the end consumer's experienced benefits and the value of the business. A core competency can take various forms, including technical/subject matter know-how, a reliable process and/or close relationships with customers and suppliers. It may also include product development or culture, such as employee dedication, best financial resources management, and good market coverage.

Table 2.1: Theory Development

Research paradigms	Terminologies associated with paradigms	Basic methods	Data collection measures
Positivist/post positivist	Experimental Theory examination Causal relative Explanatory competence regulatory	This paradigm will use quantitative methods, though qualitative methods could also be applicable	Questionnaires Experiment Test
Interpretivist/ Constructivist	Naturalistic Interpritivist Many participants value The social and historical interpretation, theory creation	Quantitative methods dominate although qualitative methods have also been used Explainatory	Observation

	Symbolic interaction		
Transforming	Manufacturing theory Based on the philosophy of skinner Promoting participation Enhancing defense Focused on operational performance problems Focused on change Interventionist Non-standardized Operational theory	Quantitative, qualitative and mixed methods Contextual and historic factors are described especially how manufacturing is related to operational performance	Manufacturing strategy decisions , a special need to improve operational performance
Pragmatist	Actions Focused on problem solving Application in real world Mixed methods	Concrete research questions and aims can be used in both quantitative and qualitative methods	Based on positivist as well as interpretivist paradigms

Author 2024, inspired by Martens 2014

From the table 2.1 above, there is a possibility to develop the manufacturing theory and the operational theory, indicating that, putting in place good infrastructural decisions with the mediation of core competencies can lead to superior operational performance, meanwhile taking into consideration control variables such as experience, level of education, age of the firm, size of the firm and sector of activity.

3.0 Methods and Nature of this Study

Objective: to analyse the interrelationship between infrastructural decisions, core competence and operational performance.

3.1 Method of Data Collection

The primary source of data collection was used for this study. Primary data was collected from the management and employees of the food processing companies under study. This data was collected using questionnaires where all the issues on the questionnaire were addressed. The questionnaire was structured in closed-ended questions and some open ended questions. The closed-ended questions were used to test the rating of various attributes and this help in reducing the number of related responses in order to obtain more varied responses, the open ended questions were to obtain individual opinion.

Model Specification

OP= α_0+α_1CC + α_2 (CC*CQMD) + α3 (CC*RMD) +α_4 (CC*IMD) + α_5 (CC*SDD) +α_6Age of the + $\alpha_7$swSize of the Firm$_s$+α_8Sector of Activity+ α_9Experience+ α_{10}Level of Education ε_i ………………………………………………………………………..…………………….… (4)

Where

ISD = Composite Index for Infrastructural Decisions, α_0 = Constant, $\alpha_{1,}$ α_2 $\alpha_{3,}$ $\alpha_{4,}$ α_5= are parameters to be measured, CC= Composite index for Core Competencies, CQMD=Cost and quality management, RMD=Resources Management, IMD=Inventory management, SDD=supply chain and distribution management, OP= Composite Index for Operational Performance. The control variables include: age of the firm (AF). Size of the firm (SF), Sector of activity (SA), experience and level of education, ε_i is the error term.

3.2 To test for the mediating effect of core competence on the relationship between the manufacturing strategy decisions and the operational performance

The Baron and Kenny (1986) four step approaches for testing mediation effect was used as follows.

The first step involved testing the direct relationship between manufacturing strategy Decisions and the operational performance of the firm (path A) as illustrated in figure 2 below:

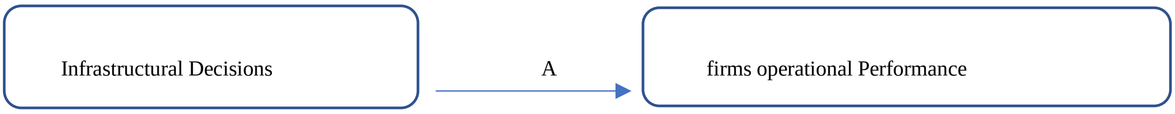
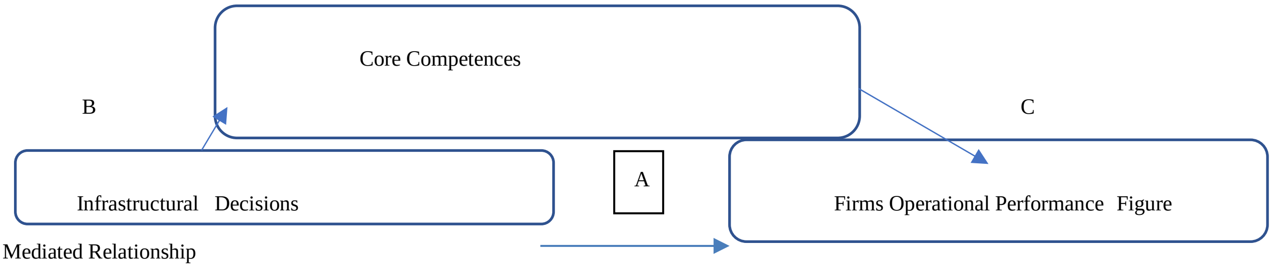


Figure 3.1: Direct relationship between infrastructural Decisions and the operational performance of food processing companies in Cameroon.

The second step involved testing path B, third step involved testing path C while the fourth step involved testing path A’ as illustrated in Figure 3.2



3.2: Mediated Relationship

3.2 Method of Analysis

Both descriptive and inferential tools were used for data analysis. For descriptive analysis, summary tables bar and pie charts were used. For the inferential statistics, the Partial Least Square Path Modelling (PLS-PM) or the Partial Least Square Structural Equation Modelling (PLS-SEM) results were engaged to interpret the causal relationships between the measured and latent variables. The Factor or Path Analysis helps in inferring relationship between the latent variables. The confirmatory Factor Analysis was employed as a method of analysis of the data collected. The Explanatory Factor Analysis was applied to help test the relationship between the measured or observed variables. The software for the Covariance-Based Structural Equation Modelling used for data processing was done with Smart PLS2

4.2.7 Test of Hypothesis Four

The fourth objective for this study was to assess the mediating effect of core competences on the relationship between infrastructural manufacturing decisions and operational performance of food processing firms in Fako and Littoral region of Cameroon. The associated hypothesis was formulated, assuming that core competences have no mediating effect on the relationship between infrastructural manufacturing decisions and operational performance of the food processing firms in Fako and Littoral region of Cameroon. To test this hypothesis, Baron and Kenny (1986) four step approaches for testing mediation effect was used.

Table 4.40 Measurement Scales Used

Variable	Item	Item Description	Reference
Infra structural Decision Category	RMD	Resources management decisions	
	CQMD	Cost and quality management decisions	Kanthana (2018)
	IMD	Inventory management decisions	Abdulla et all(2020)
	SCDD	Supply chain and distribution decisions	Djoda (2016),
Core Competences	CC1	Technical skills	Prahalad and Hamel (1990)
	CC2	Administrative skills	
	CC3	Cognitive skills	
	CC4	Transactional skills	
	CC5	Allocation skills	
Operational Performance	OPFPC1	**Referrals**: Customers gotten from referrals	Ngina (2018)
	OPFPC2	**Enquiries**: Customers gotten from enquiries	
	OPFPC3	**Networking and business events**: Customers gotten from networking and business events	

	OPFPC4	**Social Media**: Customers gotten from social media	
	OPFPC5	**Project Proposals**: Project proposals are sent to prospective customers	
	OPFPC6	New customers are gotten from the sent proposal	
	OPFPC7	**Compliments received**: A number of compliments are received from customers	
	OPFPC8	**Repeat customers**: There is an increase in repeat customers over the years	
	OPFPC9	There is an increase in the number of units produced	
	OPFPC10	**Increase in Sales**: There is an increase in sales	
	OPFPC11	The company has been making profits with high return on assets	

Source: Students research, 2024

From the table 4.40 above, infrastructural decisions is the independent variable, core competences is the mediating variable, operational performance is the dependent variable.

Table 4.41: Measurement of outer Loadings

Outer Loading Matrix	**Core Competence**	**Infrastructural Decisions**	**Operating Performance**
Technical skills	0,697		
Administrative skills	0,615		
Cognitive, Adaptability competence	0,458		
Transactional skills	0,124		
Allocation	0,288		
Cost and quality management		0,735	
Inventory Management decisions		0,759	
Customers gotten from referrals			0,301
There is an increase in sales			0,382
The is increase in return on assets			0,516
Customers are gotten from enquiries			0,731
Customers from networking, events			0,403
Customers gotten from social media			0,559
Project proposals sent to prospective clients			0,385
Customers are gotten, sent proposals			0,515
Compliments are received from customers			0,033
There is Increase in repeat customers			0,408
There is increase in the units produced			0,560

Resources management decisions		0,731	
Supply chain and distribution		0,771	

Source: Research Data (2024)

The result of table 4.41 show strong evidence of multi dimensionality and uniqueness of the items of each construct no loading under the other construct in the model since all constructs loaded under the correct heading. In other words there was no cross loading items. The loading factors for all independent variables were above the cut off criteria of 0.4 except for technical and allocating skills which are mediating variables. The result does not tell us whether the manifest indicators are significant or not. For this reason, the bootstrapping test result was computed for the outer model for individual sample t test (or statistic). Bootstrapping means resampling the original observation 3000 times to obtain the best fit t-statistic. Moreover, the bootstrapping result permits us to validate the significance of each of the indicators with respect to the construct. The various variables in the study are multifaceted and it would be erroneous to think that one question item on the questionnaire can actually explain the variation in the concepts. This explains why we prefer to use constructs in the place of variables. The result for bootstrapping t statistics for the outer model is presented in the table 4.12 below.

4.2.7.2 Quality Assessment of the Constructs

4.2.7.2.1 Measurement of the Reliability of the Constructs

Reliability is useful in assessing the degree to which manifest or observed variables (indicators) used in measuring a construct accurately reflect the concepts (Thalut, 2017).Reliability measures the extent to which a test, or an experiment or any other measuring procedures yield consistent results on repeated trial (Sullivan and Niemi, 1979). The construct in the study were infrastructural decisions (ISd), core competence (CC), and operational performance (Opfpc).

All the study constructs are reflective in nature. Reflective measurement model are used when the indicators of a construct are considered to be caused by that construct meanwhile the latent constructs are caused by formative measures. Reliability is computed only for reflective constructs. The reason advanced in structural equation modeling using partial least square suggest that reflective indicators don't have strong theoretical support, in other words, the indicators are still at the explanatory phase of the study and still to be determined if they reflect the concepts being measured. In this study two types of reliability are computed; Cronbachs alpha and composite reliability. Cronbachs alpha measures the internal consistency of constructs. It measures the extent to which item responses at the same time correlate with each other. While composite reliability (also called construct reliability) is a measure of internal consistency in scale items, much like chronbachs alpha. It is an indicator of shared variance among the observed variables used as an indicator of the latent construct (Fornell and Larcker, 1981).

Fornell and Larcker (1981) as well as Nunally and Bernstein (1994) recommend a cut off criterion of 0.7 for both composite and chronbach alpha tests of reliability. Furthermore, it is important to understand that Cronbachs alpha value as well as the composite reliability can lie between negative infinity and one. Three decision criteria that guide the interpretation of Chronbachs alpha are as follows: (1) for a value above 0.8, reliability is considered good, (2) value between 0.6 and 0.8 is considered as acceptable, (3) when the reliability is below 0.6 the reliability is considered unpredictable (Chronbach, 1951; De Souza and Dick, 2009).

Table 4. 42 Measure of Internal Consistency Test

Fornell & Larcker	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
Infrastructural decisions	0,701	0,608	0,770	0,557
Core competence	0,767	0,212	0,554	0,534
Operational performance	0,723	0,709	0,728	0,419

Source: computed by smart pls2, 2024

Based on the results on table 4.42, it can be seen that in our model, the values of the reliability indices (cronbach's α, rho-a and composite reliability c) are > 0.5 and the values of the convergent validity of ave are > 0.5. Therefore, the results are very satisfactory and show good internal consistency of the scales and strong harmony between the items, since the composite reliability (rho c) values were all greater than 0,5though between 0.5 and 0.8 for all the values as recommended by cronbash 1951 and de souza and dick (2009).

4.2.7.2.2 Validity Result of the Constructs

Convergent validity: according to this test, we aim to verify if the manifest variables measure their constructs. We applied the criteria of strong convergence described by (Fornell & Larcker, 1981). An AVE (Average Variance Extracted) greater than or equal to 0.5 indicates good convergent validity. We use the Fornell-Larcker test (1981). It is established if the measurement indicators of a construct are more correlated with each other than with those of the other constructs. The table 4.34 shows the results of our model:

Table 4.43: Result of the Test of Convergent Validity

Fornell & Larcker	**Cronbach's alpha**	**Average variance extracted (AVE)**
Infrastructural decisions	0,701	0,557
Core competence	0,767	0,534
Operational performance	0,723	0,419

Source: Computed using Smart PLS 2, 2024

Table 4.43 Show strong evidence of convergent validity for all the constructs in the model since the average variance extracted was above 0.4 for all variables in the model. Evidence of convergent validity simply means that the indicators of constructs in the study reflect the theoretical concept being measured and not the extermination matrix space (errors) of the construct.

4.2.7.2.3 Structural model analysis:

(Hair & al. 2022) state that the structural model test focuses on the values of correlation coefficients, the analysis of the coefficient of determination R^2, the index of the size of the effect of Cohen F^2 and the predictive validity Q^2 of Stone-Geisser.

4.2.7.2.4 Correlation Structure between the latent variables

Correlation measures the degree of association between the constructs in the study, also called standardized multiple regression coefficients or structural coefficients indicate the nature of the link that exists between a dependent variable and independent variable of the model. Its value is between -1 and 1, the more it tends towards 1 it means a strong positive relationship Cohen (1988). Coefficients of +/- .1 are described as weak; coefficients of +/- .3 are described as moderate and +/- .5 are described as strong correlation. The correlation coefficients of the latent variables are presented in table 4.44 below.

Table 4.44 Latent Variable Correlations Coefficients

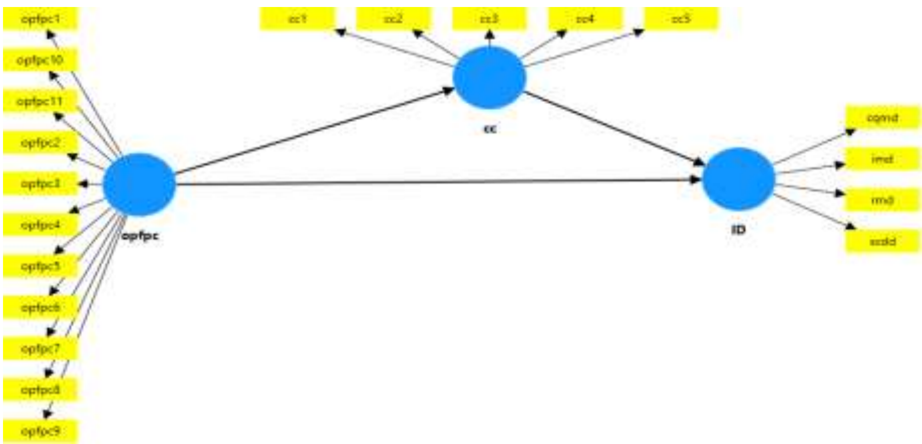
	ID	Cc	Opfpc
Infrastructural Decisions	1,000	0,347	0,552
Core competence	0,347	1,000	0,393
Operational performance	0,552	0,393	1,000

Source: Computed by Smart PLS 2, (2024)

The pairwise correlation Matrix on table 4.44 show a moderate positive correlation structure between the three constructs in the model. It was observed that infrastructural decisions had a positive correlation of 0.347, core competences had a positive correlation of 0.393 and operational performance had a positive correlation of 0.552. All the constructs had a positive relationship. The correlation values observed were 1, 0.347, and 0.552 for infrastructural decisions, 0.347, 1, 0.393 for core competences and 0.552, 0.393,1 for operational performance. According to Cohen (1988), correlation coefficient of +/-.3 represents a moderate relationship while correlation coefficients greater than +/-.5 represent a strong relationship. Meaning that there was a moderate relationship 0f 0.347 between infrastructural decisions and core competences, a moderate relationship of 0.393 between core competence and operational performance, and a strong relationship of 0.552 between infrastructural decisions and operational performance. The constructs had a strong positive relationship with operational performance.

4.2.7.2.5 Presentation of Results of the Fitted Structural Model

Due to the fact that many types of models can be fitted using the SEM and the implications of different approaches to specification and fit, report results from structural equation modeling should provide ample details regarding model specification. The principal consideration is whether the model specification is described in sufficient details. The fitted structural equation model for the three variables infrastructural decisions, core competence and operational performance is presented below:



Structural Equation Model Smart-PLS Results:

The structural equation model was fitted with the use of Smart-PLS, in structural equation partial least square modeling; the model is composed of two sub-models: the measurement model (reliability and validity of measurements) and the structural model (testing the hypothetical relationship). In the analysis, first, we must examine the measurement model, which specifies the relationship between the observed variables and the latent variables that is to say between the items and their variables, then the structural model to examine the relationship between the different latent variables (Hair, 2010).

The circles represent the construct while the rectangles represent the manifest or observed variables (Thalut, 2020). The relationship between the observed variables and the construct is called the outer model. The arrow is moving from the construct to the indicators. The construct can be justified with the use of infrastructural decisions (alpha), core competence (CC) and operational performance (OPFPC). The significance of the relationship between the constructs in the inner model as well as the relationship between the observed variables and constructs can be assessed by computing for the bootstrapping student (t) values. Before presenting the bootstrapping results, it is necessary to show the model fit index result of the Smart PLS 3 algorithm, r2 coefficient of determination as observed in table 4.45below.

4.2.8 Index of Fitness of the Model

4.2.8.1 R² coefficients of determination

It is the most used tool to evaluate the structural model; it is the proportion of the variance of a dependent variable, which is explained by one or more independent variables. (Chin, 1998) specifies that the values of 0.67, 0.33 and 0.19 can be considered respectively as substantial, moderate and weak.

Table 4.45 Determination coefficient R² R-square and the adjusted R-square

Quality criteria

Element	R2	Adjusted r2	Decision
Infrastructural decisions	0.325	0.320	Supported
Core competence	0.154	0.152	Supported

Source: Computed using Smart-PLS2, 2024

The results in table 4.45 show that 32.5% of the variation in infrastructural decisions explains operational performance (moderate value). 15.4% of the variation in core competences explains operational performance (moderate value). So our independent variables are well explained by the mediating variables. Showing that the use of infrastructural decisions is 32% of the total variation in business operation and the use of core competences is 15.2% of the variations in business operations.

4.2.8.2 The Effect Size of the Model

F² It is used to determine the intensity of the impact, according to Cohen (1988): F² >35% means a large effect size, 15% < F² < 35% medium size, 2% < F² < 15% a small size and F² < 2% means no effect size (Hair & al., 2022).

Table 4.46 F-Square Matrix

F Square Matrix	**f-square**
Core Competence -> Infrastructural decisions	0,133
Operational performance -> Infrastructural decisions	0,303

Operational Performance -> Core competence	0,183

The F-square values were used to determine the size of the Effect, the f2 value for infrastructural decisions was 30.3 % indicating a medium size effect, core competences had an effect of 13.3% indicating a small size effect and operational performance had an f2 value of 18.3% indicating a medium size effect. The f2 values for all the constructs were greater than the critical table value of 2.43 indicating that infrastructural decisions and core competences affect operational performance.

4.2.8.3 Predictive Relevance Q^2Analysis of the size of the effect in the Model

The Stone-Geisser coefficient Q^2, also known as the cross-validation redundancy index, when $Q^2>0$ means that the model has predictive validity while when $Q^2<0$ it means the model studied does not have predictive validity (Hair & al., 2022).

Table 4.47 Predictive Relevance Q^2Analysis

Cross Validation redundancy index	**Binary Probit Coefficient**	**Coefficient of F-Statistics**	**Marginal Effect Coefficient**
Technical skills	0,150	0,288	0,078
Administrative skills	0,213	0,697	0,293
Cognitive, Adaptability competence	0,182	0,615	0,283
Transactional skills	0,216	0,458	0,119
Allocation Skills	0,035	0,124	0,023
Cost and quality management decisions	0,735	0,255	0,339
Inventory Management decisions	0,759	0,297	0,393
Customers gotten from referrals	0,168	0,132	0,301
There is an increase in sales	0,165	0,099	0,382
The is increase in return on assets	0,202	0,136	0,516
Customers are gotten from enquiries	0,525	0,392	0,731
Customers gotten from networking and business events	0,255	0,134	0,403
Customers gotten from social media	0,266	0,178	0,559
Project proposals sent to prospective clients	0,177	0,106	0,385
New customers are generated from sent proposals	0,205	0,131	0,515
Compliments are received from customers	0,082	-0,005	0,033
There is increase in the number of repeat customers over the years	0,197	0,220	0,408
There is increase in the units produced	0,260	0,173	0,560
Resources management decisions	0,731	0,178	0,380
Supply chain and distribution decisions	0,771	0,201	0,381

Source: research data 2024

Results on table 4.47 show that, the values of Q^2 are > 0; this means that the model has substantial predictive validity and it appears that the model has a predictive ability to explain the variable operational performance. The Q2 shows the size of the Effect of the independent latent construct on the dependent latent construct. All the Q2 values are greater than zero. On the other hand, the effect size measures the substantial impact of the independent latent construct on the dependent latent construct. Values of 0.02, 0.150 and 0.350 indicate whether the predictor variable is low, medium or large of effects in the structural model. The partial least square algorithm and weighting scheme are presented in the tables below:

4.2.8.4 Channels through Which Core Competences Influence the Relationship between Infrastructural Decisions and Operational Performance (Mediating Factor Analysis)

The mediating variable is the variable that explains the effect and reason for the relationship between the independent variable and the dependent variable. In our case, the mediating variable is core competence in the analysis of the effect of mediation we followed the method proposed by Preacher and Hayes (2008): Measure of total direct effects (bootstrap the indirect effect) with the use of path coefficients.

The Baron and Kenny mediation was conducted to assess if core competence mediate the relationship between infrastructural decisions and operating performance. For mediation to be supported, the following four conditions must be met: 1) the independent variable must be related to the dependent variable, 2) the independent variable must be related to the mediator 3) the mediator must be related to the dependent variable while in the presence of the independent variable 4) the independent variable should no longer be a significant predictor of the dependent variable in the presence of the mediator variable (Baron and Kenny, 1986). This model seeks to explain the process mechanism that explains the observed relationship between an independent variable via the inclusion of the third variable.

Table 4.2.9.1 Bootstrap of Total effects of Original sample (O) Sample mean (M) Standard deviation

The relationship between indirect variable and direct variable via mediator must be significant. Representing the total effect according to the following form: Path A Path B through to the bootstrap, we extract the indirect effect and find a P-value 0.000, which shows that, the relationship between the independent variable: infrastructural manufacturing decisions and the dependent variable operational performance via core competence as a mediator is considered significant and acceptable.

Table 4.48 Total Effects Model T-Statistics

Total Effects	**Mean**	**Standard deviation**	**Excess kurtosis**	**Skewness**	**Number of observations used**	**Cramér-von Mises test statistic**	**Cramér-von Mises p value**
Technical skills	4,236	0,955	3,294	-1,766	309,000	5,519	0,000
Administrative skills	4,152	0,917	3,627	-1,749	309,000	6,199	0,000
Cognitive Skills	3,896	1,019	1,055	-1,230	309,000	6,385	0,000
Transactional skills	4,042	1,144	0,741	-1,281	309,000	5,070	0,000
Allocation competence	3,974	1,064	1,757	-1,455	309,000	6,625	0,000
Cost and quality management decision	4,284	0,512	0,721	-0,744	309,000	1,355	0,000
Inventory management decisions	4,166	0,513	0,799	-0,724	309,000	0,863	0,000
referrals	4,184	0,960	2,148	-1,525	309,000	5,414	0,000
sales	4,184	0,986	1,850	-1,496	309,000	5,433	0,000
Profit/returns	4,188	0,731	4,304	-1,507	309,000	7,195	0,000
enquiries	4,120	0,485	12,622	-1,417	309,000	14,702	0,000
Business events and networking	4,288	0,961	2,238	-1,638	309,000	5,993	0,000
Social media	4,178	0,909	3,068	-1,633	309,000	5,698	0,000
Sent project proposals	4,201	0,991	1,858	-1,514	309,000	5,477	0,000
Approved project proposals	4,207	0,739	4,177	-1,512	309,000	6,794	0,000
Compliments received	4,294	0,976	3,142	-1,816	309,000	6,043	0,000
Repeat customers	4,178	0,880	4,559	-1,874	309,000	6,473	0,000
Units produced	4,191	0,913	3,051	-1,643	309,000	5,607	0,000
Resources management decisions	4,312	0,424	0,908	-0,663	309,000	1,102	0,000
Technical skills	4,077	0,482	0,122	-0,345	309,000	0,601	0,000

Source: Computed by Smart PLS 2, 2024

The table 4.48 above shows the bootstrapped total effects of the mediating variable on the dependent variable and how the mediating variable links the dependent and independent variable. The manifest indicators were significant at 1%, 5% and 10% level of significance. The t values were far above 1 .The relationship between indirect variable and direct variable via mediator must be significant. Representing the total effect according to the following form: Path A Path B through to the bootstrap, we extract the indirect effect and find a P-value 0.000, which shows that, the relationship between the independent variable: infrastructural manufacturing decisions and the dependent variable operational performance via the core competences as a mediator is considered significant and acceptable. We extract the indirect effect and find P-value = 0.000, which shows that the relationship between infrastructural manufacturing decisions and operational performance via core competence is considered significant and acceptable. According to the table above, concerning the direct effect of core competence on operational performance: T-Statistics=5.519, 6.199, 6.385, 5.070, and 6.625 therefore >2 and P-Value=0.000 therefore <0.05. So core competence positively influences operating performance which confirms hypothesis four.

There was an indirect effect in using infrastructural decisions through core competences to achieve operational performance. As can observed from 4.31, 4.32, and 4.33 there are three linkages from core competences, operational performance and infrastructural decisions. The t statistics of core competence and operating performance of .542 and .394 all above the thresh hold of two make the results significant at 1% level of significance, indicating a 99% confidence level. We therefore tend to reject the null hypothesis that states that, core competences does not have any significant mediating effect on the relationship between infrastructural decisions and operational performance.

4.2.8.5 Analysis of mediating variables and Hypothesis testing

The mediating variable is the variable that explains the effect and reason for the relationship between the independent variable and the dependent variable. In our case, the mediating variable is core competence, in the analysis of the effect of mediation we followed the method proposed by Preacher and Hayes (2008): Measure of total direct effects (bootstrap the indirect effect)

4.2.8.6 Direct Mediating effects

The direct effects measure the extent to which the dependent variable increase by one unit and the mediator variable remains unchanged. This means a unit increase in operating performance when a unit of infrastructural decision increases and core competences remain unchanged.

Table 4.49 Path Coefficients of direct Effects of the Usage of Core Competences on Operational Performance

List of Path Coefficients	**Path coefficients**	**Decision**
Core competence -> Infrastructural decisions	0,154*	Supported
Operational Performance -> Infrastructural decisions	0,492*	Supported
Operational performance -> Core competence	0,393**	Supported

Source: Computed using Smart PLS 2, 2024

The results in table 4.49 show the direct link between the respective channels and their effects on operating performance. It means that an increase in core competence has a positive significant effect on infrastructural decisions in food processing firms in the Fako division and the Littoral region of Cameroon. The result is significant at 10% level of significance and reliable at 90% confidence interval. The results show that a unit increase or decrease in core competences will increase or decrease infrastructural decisions by 15.4%. This enables us to reject the null hypothesis that there is no significant relationship between core competences and infrastructural decisions. All the main element of core competences affects infrastructural decisions showing that the firm should put in place cognitive, adaptability, administrative, allocation, technical and transactional skills. Furthermore; an increase in infrastructural decisions has a positive significant effect on operational performance, a unit increase in infrastructural decisions increase operational performance by 49.2%. This result is significant at 1% and has a 99% confidence level that a unit increases or decrease in infrastructural decision categories will increase or reduce operational performance by 49.2% showing that the firm should put in place resources management decisions, cost and quality management decisions, inventory management decisions, supply chain and distribution decisions.

Also, the results in table 4.44 above reveal that there is a relationship between core competence and operational performance is statistically significant at 5%level of significance and 95% confidence level, meaning that a unit increase or decrease in core competences will increase or reduce operational performance by 39.3%. This means that core competences such as technical skills, administrative skills, allocating skills, transactional competence and adaptability competence positively affect operational performance.

4.2.8.7 Indirect Mediating Effects

The indirect mediating effect measures the extent to which the dependent variable changes when the independent Variable is held fixed and the mediator variable changes by the amount it would have changed had the independent variable increased by one unit.

Table 4.50 Indirect Effects

List	Total effects coefficient	Decision
Core competence -> Infrastructural decisions	0,154***	Supported
Operational Performance -> Infrastructural decisions	0,552**	Supported
Operational Performance-> Core competence	0,393***	Supported

*** indicates significant at 1% level of significance,** 5% level of significance

Source: Research Data (2024)

There was an indirect effect in using infrastructural decisions through core competences to achieve operational performance. As can observed from 4.50 there are three linkages from core competences, operational performance and infrastructural decisions. The t statistics of core competence and operating performance of .552 and .394 all above the thresh hold of 0.2 make the results significant at 1% level of significance, indicating a 99% confidence level. We therefor tend to reject the null hypothesis that states that, core competences does not have any significant mediating effect on the relationship between infrastructural decisions and operational performance. A unit increase in core competence will increase operational performance by 39.3%. This is confirmed by the first link which states that, a unit increase in core competences will improve infrastructural decisions by 15.4% while a unit increase in infrastructural decisions will improve operational performance by 55.2%. This is evidence of partial mediation.

Table 4.51: Summary of the test results of the study hypotheses

Hypothesis	**Findings**	**Decision**	**Conclusion**
$H_{04:}$ core competences have no mediating effect on the relationship between infrastructural decisions and operating performance of the food processing firms of Fako and Littoral region of Cameroon	P= 0.002< 0.05 for infrastructural decisions P= 0.014< 0.05 for Core competences Evidence of Partial mediation	Reject H_{04}	Core competences partially mediate the relationship between infrastructural decisions and operating performance of food processing firms in the Fako and Littoral region of Cameroon

Conclusion

Based on the study findings, the study made the following three conclusions. First, the study concluded that food processing firms should use various infrastructural decisions: resource management, cost and quality management, inventory management, supply chain and distribution management to a moderate extent. Secondly, the study concluded that the deployed infrastructural decisions have a significant positive effect on the operational performance of food processing firms in Fako division and Littoral region of Cameroon. Finally, the study concluded that the relationship between the deployed manufacturing strategy decisions and the operational performance of food processing firms is dependent on the level of competences generated from the deployment of infrastructural manufacturing strategy decisions.

Recommendations

The management should incorporate infrastructural decisions such as, cost and quality management, resources management, inventory management, supply chain and distribution management. The management should put in place effective and better manufacturing decisions and strategies that will enable knowledge acquisition, dissemination and application so as to improve firm operating performance.

The second recommendation is that the top management of the food processing firms in Fako division and Littoral region should focus on building competences such as cognitive, adaptability, allocated, administrative, transactional and technical competences so as to guarantee sustainable operational performance. This should be achieved through seeking to maintain their staff for a longer period of time since these competences is built over time by organising training seminars and workshops.

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