Innovations

Enterprise Value Chain and Customer Preferences in Nigerian Pharmaceutical Industry

Onyemaechi Cyril Aninwike[1], Anastasia Ifechukwudebelu Ogbo[1]

Department of Management, Faculty of Business Administration, University of Nigeria Enugu Campus

Abstract

This study focused on enterprise value chain and customer preferences in Nigerian Pharmaceutical Industry. The study determined the relationship between material requirements planning and customer satisfaction with responsiveness; ascertained the relationship between total quality management and customer expectations of service delivery in the industry; and established the relationship between value chain marketing of pharmaceutical organizations in Nigeria and customer satisfaction with product availability. The research adopted a survey research design. The total population of the study was 1,835 physicians.The sample size of the study was 600. The study reveals that materials inventory, order processing, and order revising have significant positive effects on customer satisfaction with service responsiveness within the Nigerian pharmaceutical industry. Findings further revealed that materials inventory, order processing, and order revising have significant positive effects on customer satisfaction with service agility in the pharmaceutical industry. This study sheds light on the intricate relationship between enterprise value chain processes and customer satisfaction in the Nigerian pharmaceutical industry. The study recommended among others that pharmaceutical companies should prioritize efficient materials inventory management, streamlined order processing, and effective order revising to enhance customer satisfaction with service responsiveness and agility.

Keywords: *Material Requirements Planning, Customer Satisfaction, Total Quality Management, Customer Expectations, Service Delivery*

Introduction

The pharmaceutical industry, recognized for its global importance in healthcare, faces challenges in sustaining its operations and addressing evolving risks (McKelvey & Orsenigo, 2001). Sustainability in this industry involves effective management of the value chain, supply

chain, and customer relationships. The World Health Organization (WHO) highlights the importance of making life-saving pharmaceutical products available, affordable, of assured quality, and properly dispensed (WHO, 2004). Despite this, accessibility to quality medicines remains a global concern, particularly in developing countries. A World Bank report reveals that one-third of the global population lacks regular access to medicines, with 80% of this demographic residing in developing countries (Aigbavboa & Mbohwa, 2020; National Academies of Sciences, Engineering, and Medicine Division, 2018). Business process improvements in the pharmaceutical value chain have the potential to save millions of lives annually (WHO, 2004; Cohen, 2011). Achieving sustainable competitive advantage in this context involves continuous improvement practices, analyzing value chain drivers, and understanding value creation activities.

Value chain analysis, a concept pioneered by Michael Porter, involves assessing the full range of activities transforming a product or service from conception to distribution. Starbucks, as an example, successfully utilizes value chain analysis to align its corporate mission with customer preferences, optimizing various aspects of its operations (Richey & Ponte, 2021; Yoon et al., 2020). In the pharmaceutical industry, value chain analysis differentiates between producer-driven and customer-driven chains, with a focus on enhancing resource access and maximizing opportunities within the industry (Mina et al., 2020; Prasetyo & Dzaki, 2020; Rzak et al., 2018). The evolution from a product-oriented value chain to a customer-driven value chain emphasizes collaboration among internal teams, a customer-centric approach, and considerations for research and development, market opportunity analysis, and resource exploration (Hines, 1993; Kapeleris et al., 2004; Walters & Rainbird, 2006). This shift redefines the producer-customer relationship as co-creators of value at every stage. Understanding and appreciating customer preferences become crucial for developing insights that guide procurement, production, storage, marketing, and delivery processes.

In today's business environment, customer preferences significantly influence purchase decisions, guided by word-of-mouth and online reviews (Wang et al., 2020). The Nigerian pharmaceutical industry, a significant contributor to the West Africa region, faces challenges related to low quality assurance, compromised supply chains, unharmonized regulation, and various constraints (Alozie et al., 2020; Aninwike, 2020; Klantschnig & Huang, 2019). To address these challenges, a customer-driven value chain analysis, exemplified by the Solution Access Value Education (SAVE) Framework, can play a pivotal role in educating customers about an enterprise's capacity to provide needs-based, accessible, and value-creating services (Inaloo et al., 2018).

Empirical evidence is crucial for understanding the nexus between pharmaceutical value chains in Nigeria and customer preferences. In the contemporary landscape, consumers are exceptionally informed and vocal, utilizing various accessible platforms to express their opinions on product or service experiences. The study addresses a significant problem in the pharmaceutical industry in Nigeria, characterized by a lack of empirical evidence regarding the alignment of pharmaceutical companies' value chains with the preferences of their customers. There is an observed absence of insights into the relationship between material

requirements planning and customer satisfaction with responsiveness in the Nigerian pharmaceutical industry; inadequate understanding of the relationship between total quality management and customer satisfactions with service delivery in the industry; limited knowledge about the relationship between value chain marketing strategies employed by pharmaceutical organizations in Nigeria and customer satisfaction with product availability; and insufficient comprehension of the relationship between safety integration practices and customer satisfaction with the safety of pharmaceutical supply chains in the study area. This gap in understanding poses challenges to the industry's ability to meet customer expectations effectively. The problems underscore the pressing need for comprehensive research to bridge these knowledge gaps and enhance the industry's responsiveness to the preferences and expectations of its customer base.

Objectives of the Study

The general objective of this study is to examine the extent to which value chain of pharmaceutical companies align with pharmaceutical product customer preferences in Nigeria. The aim of the study is decomposed into the following objectives of the study:

i. Determine the relationship between material requirements planning and customer satisfaction with responsiveness in the Nigerian pharmaceutical industry.
ii. Ascertain the relationship between total quality management and customer expectations of service delivery in the industry.

Review of Related Literature

The concept of the value chain is heavily influenced by Porter's (1985) ideas on competitive advantage. It centers on viewing the value chain as a set of distinct activities that a firm utilizes to achieve competitive advantage and shareholder value. This perspective envisions a firm as a sequence of interrelated activities such as conception, procurement, design, production, marketing, delivery, and support services, forming a correlated chain. In essence, it involves the flow of value from raw material procurement, through various configurations and transformations, to the ultimate consumer (Simatupang et al., 2017).

It is crucial to understand that the term "value" carries different connotations based on diverse industry and discipline-driven conceptualizations. In this study, the focus is restricted to the business management discipline's conceptualization, defining value as a firm's utility demonstrated through its ability to stimulate demand (Ilyas et al., 2006). Porter (1985) adds that the creation of demand should surpass the cost of producing the utility, representing the maximum amount an individual or group is willing to pay for the utility. This implies that organizations are motivated by activities that maximize value and minimize costs at the operational level. Besides utility, the term "value" has also been associated with the perceived worthiness of a product by its user. However, this perception-based characterization

introduces subjectivity and sentimental bias, potentially misleading in assessing organizational performance.

Some management scholars, acknowledging the subjective nature of perceived worthiness, have moved towards defining value as a measure of organizational performance. This departure is evident in the works of Franco-Santos et al. (2007), Neap and Celik (1999), and Schjoedt and Kraus (2009). They define value as a measure of organizational performance, aligning with characterizations of value as the effectiveness of productive effort. Drawing on the analogy equating value to organizational performance, a value chain represents a set of activities defining an organization's performance in its industry. This aligns with Porter's (1985) broader definition of a value chain as activities performed by a firm determining its market competitive positioning. These activities are considered the "building blocks by which a firm creates value for its buyers" (Porter, 1985; Sivula et al., 2014).

The value chain is seen as an organizational strategy aimed at reducing costs and increasing customer satisfaction (Strakova et al., 2020). This perspective, shared by Kumar & Rajeev (2017), views the value chain as a strategic tool for identifying distinct business processes involved in product/service design, marketing, delivery, and support. The effectiveness of the value chain as an organizational strategy lies in its ability to link these business processes in a coordinated and efficient sequence. Scholars like Burton et al. (2016) argue that the value chain is a network encompassing all value-creating activities from raw materials to finished goods and their delivery to consumers. It is perceived as a system comprising linked input, transformation, output, and delivery subsystems. Essentially, it serves as a linear map aiding management decisions on where and how to add value.Despite its utility, some academics question the use of linearity in conceptualizing the enterprise value chain, citing its complexity. Issues such as stakeholder relations, price fluctuations, and the identification of performance-upgrading areas contribute to the perceived complexity of value chains (Gerassimidou et al., 2022). Nevertheless, Kaplinsky amd Morris (2013) argue that not all value chains are inherently complex, noting the existence of simple, extended, and multi-value chains.

Examining customer preferences through the lens of psychology literature, Fam et al. (2019) posit that these preferences encompass an individual's attitude towards a product, manifested in their decision-making process. If attitudes are considered overall evaluative judgments influenced by various factors (Ahn & Back, 2018), then, from a psychological standpoint, it implies an explicit expression of liking or disliking a product. When such feelings are not consistent, organizations are compelled to restructure their value chain to enhance the likability of their products. However, likability alone is not the ultimate goal, especially when recognizing that a favorable attitude does not always translate into actual purchase intentions. Thus, bridging the gap between favorable attitude and actual purchase intention becomes essential. It is crucial to rely on predictive analytics and automated collection of sales data from various customer touchpoints, including retailer point-of-sales

data, channel partner data, and e-commerce sales portal data (Jiang et al., 2019). In more developed markets, this data is often stored in a Demand Signal Repository (DSR), a cross-enterprise database facilitating easy retrieval of sales information for strategic decision-making (Černikovaitė et al., 2021). However, the challenge for organizations in less developed markets is how to identify customer preferences without such sophisticated systems.

Sahoo and Pillai (2017) propose that the gap between favorable attitude and purchase intention may be attributed to the existence of a more preferable alternative. In this context, customer preferences could be seen as a customer's favorable attitude towards product A compared to B, leading to a preference for A. Organizations must then strive to make their product more favorable. In response, Adebiyi et al. (2016) focus on customer satisfaction as a key determinant of product preference, asserting that satisfaction is crucial for identifying appealing product features and aligning the value chain accordingly.

Building on the satisfaction perspective, Ding et al. (2017) argue that customer satisfaction is linked to happiness, fulfillment, and enjoyment of a firm's service, influencing purchase and repurchase decisions. Empirical evidence from various studies supports the efficacy of using customer satisfaction as a mirror of customer preferences for specific products and services (Adebiyi et al., 2016; Černikovaitė et al., 2021; Ding et al., 2017; Elaho & Elechi, 2019). Further validation of the significance of customer satisfaction comes from the American Customer Satisfaction Index (ACSI), which emphasizes its major effects on business objectives, including customer retention, preferences, profitability, sales growth, cash flows, stock returns, and more. Numerous empirical works also adopt the ACSI Customer Satisfaction Score (CSAT) Methodology as a generic determinant of customer-driven value chains, justifying its use as a metric reflecting overall customer satisfaction in terms of product quality, customer service, and price. In line with these studies, the present research adopts the ACSI methodology as a determinant of the alignment between pharmaceutical value chains and customer preferences in Nigeria, especially considering the scarcity of big data on customer preferences for pharmaceutical products in the country akin to a Demand Signal Repository (DSR).

Activities in the Pharmaceutical Value Chain

The significance of materials requirements planning in the pharmaceutical industry is crucial due to the sensitivity of pharmaceutical products and their direct impact on public health and well-being. This importance is reflected in both Hines' value chain model and the World Health Organization's (WHO) pharmaceutical value chain model, where the material team plays a central role. The study underscores Total Quality Management (TQM) as a key activity in the pharmaceutical value chain, serving as a measure of its effectiveness. Both Hines' and WHO models incorporate the customer perspective, emphasizing the need for effective marketing considerations.

In Hines' model, customer preferences guide the value chain, stressing the importance of ensuring customers understand and value the organization's offerings, as well as the accessibility of products and services. Inaloo et al. (2018) advocate for communication with customers, educating them about the relevance of the firm's products and their accessibility. Wani (2013) supports this shift in marketing methodology, emphasizing customer education about the firm's solutions and value within the SAVE framework.

The study recognizes that informed customer input is essential for enhancing the pharmaceutical value chain, creating satisfied customers who may advocate for the organization. Customer education is not only vital for improving the value chain but also acts as a safety mechanism, particularly during pandemics. The Covid-19 pandemic serves as an example, with healthcare organizations actively engaging in campaigns to educate customers on safety measures. An additional objective in the study is the integration of safety considerations, acknowledging that Porter's and Hines' value chain models may overlook the regulatory and governance frameworks in the pharmaceutical value chain. Given that pharmaceutical products are designed for consumer safety, the study emphasizes the need for manufacturing investments to adhere to rigorous regulatory and legislative policies. This perspective is drawn from authoritative sources stressing the importance of robust regulation, legislation, and policies in pharmaceutical manufacturing (Arnold & Oakley, 2019; McDermott et al., 2022). The study also reviews materials requirements planning and total quality management as indicators of the effectiveness of the pharmaceutical value chain.

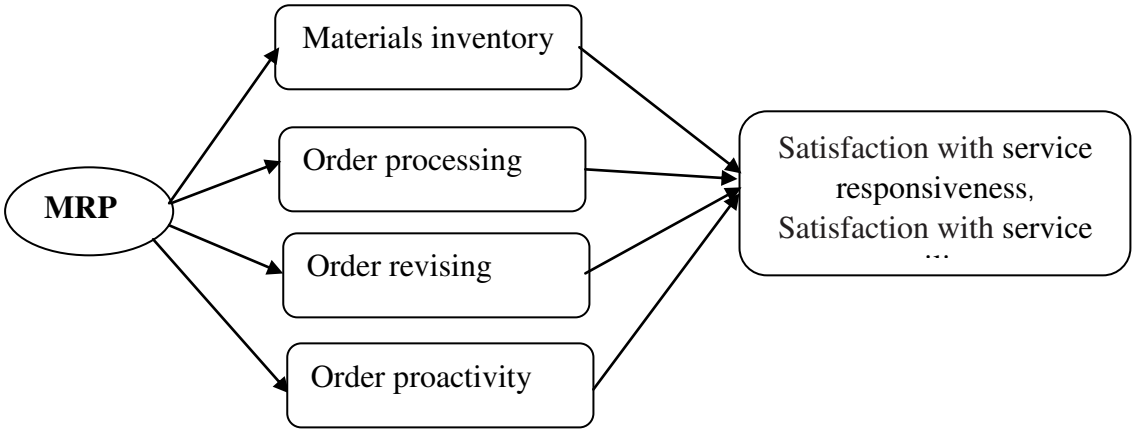
Materials Requirements Planning and Customer Satisfaction

The flow of materials throughout a supply chain encompasses physical inventory, production processes, and logistics or distribution processes. Each material flow or value stream, representing the combined processes involved in creating a product, needs to be configured to optimize customer service levels at the minimum cost (Hines et al., 2004). This optimization is at the core of MRP. MRP originated in the United States in the 1960s as an "order launching system" and has since evolved into a more digitized manufacturing and supply chain integration process. It is now considered a "computerized inventory control and production planning system" that utilizes backward scheduling to enhance production efficiency (Lynn, 2006; Ogedengbe et al., 2002).

Numerous studies have shed light on the MRP process. MRP furnishes the value chain manager with essential information on what is required for production and where to source it. Its objective is to provide insights into the quantity and quality of materials needed for production, as well as the timing of their delivery and utilization (Oladokun & Olaitan, 2012). Beyond determining material quantity and quality, explanations of MRP also highlight its applications in assessing the cost of materials and the value they contribute to the value chain. Charles-Owaba & Oladokun (2007) state that financial evaluation within the MRP process assists the value chain manager in selecting appropriate materials and prioritizing material vendors.

In essence, MRP addresses the material-related questions of what is needed, how much is needed, at what cost, and when it is needed to satisfy customer demand promptly and adequately. Effective material requirements planning ensures organizational responsiveness while minimizing inventory costs. This poses a practical challenge for value chain managers in terms of minimizing inventory costs and maximizing production capacity. The study examines the adoption of MRP in the pharmaceutical value chain, emphasizing its integration of customer preferences measured by customer satisfaction, especially concerning order processing for healthcare facilities in normal and emergency periods. This approach aligns with the works of Olartan (2008) and Ozgur et al. (2006), who assert that MRP utilizes applications such as Master Schedule Programme, Inventory Records, and Bills of Materials in responding to sales orders, service orders, and sales forecasts. Schuster et al. (2000) explain that MRP's responsiveness is a function of its ability to record planned orders and inventory status reports, adapt to changes in due dates and late orders, and assess performance. Despite the relevance of digitized MRP to customer satisfaction, there is a gap in existing literature regarding its adoption by the manufacturing industry in Nigeria, particularly in the face of service delivery disruptions caused by power outages and an unstable socioeconomic environment (Oladokun et al., 2012). The study examines customer satisfaction with the pharmaceutical value chain in the country through the lens of materials requirements planning, as depicted in Figure 1.

Figure 1 MRP and Customer Satisfaction



TQM and Customer Satisfaction

Total Quality Management (TQM) emerged in response to intense global competition, prompting companies to seek improved ways to satisfy customers and outperform their competitors. Deming (1986) contends that the pursuit of enhanced quality service delivery results from a continuous process of identifying and reducing errors in the manufacturing process, coupled with employee training to enhance customer experience. This perspective encapsulates TQM's rationale as a measure for improving product quality and performance.

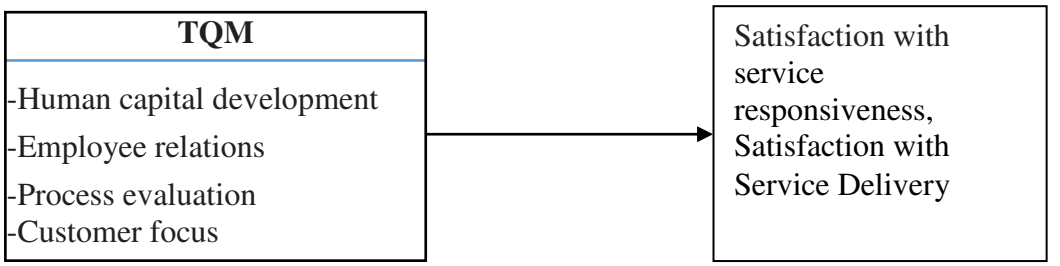
Building on this rationale, various studies on TQM have identified it as a precursor to improvements in quality, workplace collaboration, employee participation, productivity, customer satisfaction, job satisfaction, and market share expansion (Abbas, 2020; Arqawi & Zaid, 2020). Other research highlights its role in reducing production waste, fostering teamwork, enhancing flexibility, effectiveness, competitiveness, and improving business practices to meet customer needs and demands (Chiarini, 2020; Kaur et al., 2019).

The perceived outcomes of TQM have attracted significant scholarly interest in the globalized business environment. Studies have taken diverse approaches, incorporating insights from quality leaders, formal evaluation models (such as the European Quality Award, Malcolm Baldrige National Quality Award, and The Deming Award), and empirical research (Abbas, 2020; Eniola et al., 2019). Despite these diverse approaches and findings, a consensus on the universal characteristics of TQM in the pharmaceutical value chain remains speculative.

However, the significance of TQM cannot be understated, considering the impact of globalization, the knowledge economy, and the heightened awareness of customers about quality. Organizations operate in an environment where customers are increasingly informed, technological solutions are diffusing rapidly, and conventional processes are being reengineered (Ogbo et al., 2015). Despite the lack of consensus in existing TQM research, the study recognizes the need to address this gap and proposes a conceptual model of TQM for the pharmaceutical value chain to shed light on its alignment with customer preferences in the Nigerian industry, drawing from Hines' (1993) model.

A systematic review of studies identifying TQM performance indicators and parameters reveals a prevalent focus on human capital development, employee relations, process evaluation, customer focus, innovativeness, supplier management, measurement and feedback culture, benchmarking, rewards and recognition, and people management. This study specifically identifies TQM parameters directly influencing customer satisfaction, including human capital development, employee relations, process evaluation, customer focus, and ICT (information and communication technology) (Chiarini, 2020).

Figure 2 TQM and Customer Satisfaction



Methodology

The research adopted a survey research design, chosen for its ability to simultaneously collect, analyze, and describe quantitative data. To investigate the alignment between enterprise value chains and customer preferences in the Nigerian pharmaceutical industry, primary data was gathered using a questionnaire. The focus of the study is to determine the consistency between the value chain of pharmaceutical companies and the observable preferences of their customers. Therefore, the study chose to use customer satisfaction with the pharmaceutical value chain as a proxy for assessing this relationship, aligning with similar empirical studies (Azzamouri et al., 2021; Chassagnol et al., 2020). The population under consideration encompasses all pharmaceutical enterprises in Nigeria. The population pertains to physicians who procure pharmaceutical products for clinical or prescription purposes.

Table 1 Distribution of Physicians by State and Gender

State	Male	Female	Total
Abia	216	73	289
Anambra	390	162	552
Ebonyi	143	41	184
Enugu	345	146	491
Imo	229	90	319
Total	1,323	512	1,835

Source: National Bureau of Statistics (2021).

Table 1 presents the state-by-state physician population (National Bureau of Statistics, 2021). According to the report, there is a total population of 1,835 physicians in the geopolitical zone. For the sake of convenience, the survey was confined to physicians in Anambra, Ebonyi, and Enugu States, resulting in a total of One Thousand, Two Hundred and Twenty-Seven (1,227) physicians. To determine the required sample size, both the Godden formula and Stat Trek's Sample Planning Wizard tool were utilized. The Godden formula was applied for end users since their population is infinite, while Stat Trek's Sample Planning Wizard tool was employed for physicians in the South East region due to their finite population. Considering the open-ended nature of the end user segment of the study population, the Godden (2004) formula was chosen for sample size determination. The formula is given as:

$$n = \frac{Z^2 p(1-p)}{C^2}$$

Where:

n = sample size
p = population proportion
C = margin of error
Z = level of confidence

From the result of the pilot study, p=0.5 was generated, and at $\propto$=0.04 (margin of error), Z = 1.96. Thus, we have:

$$n = \frac{(1.96)^2(0.5)(.5)}{(.04)^2} = \frac{3.8416(0.25)}{.0016} = \frac{.9604}{.0016}$$

600.25

Thus, the sample size of the study is 600 consumers of pharmaceutical products in Nigeria. Since the population of physicians in Anambra, Ebonyi and Enugu is 1,227, Stat Trek's Sampling Wizard tool for sample size determination was used as follows:

$$n = \frac{z^2pq + e^2}{e^2 + (z^2\text{pq/N})}$$

Where n = sample size
z = standard error of the mean (usually 95%, corresponding to 1.96 in the z-distribution table).
p= estimated proportion of an attribute that is present in the population.
q=estimated proportion of an attribute that is not present in the population.
e = tolerable error margin (5% or 0.05)
N = population size (which is 1,227)

To apply this formula, 95% confidence level was desired, tolerable error margin of 5% was allowed and by the principle of Binomial Distribution, the estimated proportion of attributes present and those not present in the population was determined to be 50% each. The justification for this is because, the probability that the physicians will respond favourably to the survey arise naturally from 2 likely occurrences. Thus, p = 0.5 and q = 0.5.

$$n = \frac{(1.96^2 \times 0.5 \times 0.5) + 0.05^2}{0.05^2 + \{(1.96^2 \times 0.5 \times 0.5)/1{,}227\}}$$

$$\frac{0.9629}{0.003282722086389}$$

n = 293.3236425929651
Approximately 293 physicians

From these calculations, a total of 893 respondents (consumers) took part in the survey. Stratified random sampling was utilized for consumers, involving community pharmacists in the area as provided by the PCN South East zonal office in Enugu. Additionally, cluster random sampling was employed for physicians, adhering to State-by-State proportions to ensure instrument validity. To verify the instrument's adequacy, appropriateness, inclusiveness, and relevance to the study's subject, a factor loading analysis was conducted (as presented in Table 1). All items exhibited factor loadings above 50%, except for the 4th item for Satisfaction with Service Responsiveness and the 2nd item for Order Proactivity. This indicates that the items have robust factor loadings, affirming the instrument's validity. The study's reliability was assessed using Cronbach's Alpha Test, and Table 1 demonstrates reliability results with all alpha values exceeding 0.70. This signifies that all constructs have reliable items.

Table 1 Validation of Instrument

S/N	Question Items	α	Factor Loading
	Materials Inventory	.784	
1	MSI1		.952
2	MSI2		.941
3	MSI3		.895
4	MSI4		.954
	Order Processing	.792	
5	ORP1		.880
6	ORP2		.761
7	ORP3		.535
8	ORP4		.500

	Order Revising	.872	
9	ORR1		.640
10	ORR2		.557
11	ORR3		.744
12	ORR4		.620
	Order Proactivity	.787	
13	OPY1		.877
14	OPY2		.457
15	OPY3		.750
16	OPY4		.823
	Human Capital Development	.836	
17	HCD1		.960
18	HCD2		.722
19	HCD3		.747
20	HCD4		.866
	Employee Relations	.828	
21	ERS1		.709
22	ERS2		.789
23	ERS3		.516
24	ERS4		.654
	Process Evaluation	.726	
25	PEN1		.697
26	PEN2		.870
27	PEN3		.701
28	PEN4		.500
	Customer Focus	.798	
29	CFS1		.734
30	CFS2		.911
31	CFS3		.608
32	CFS4		
	Satisfaction with Service Responsiveness	.799	
33	SSR1		.770
34	SSR2		.568
35	SSR3		.614
36	SSR4		.454
	Satisfaction with Service Agility	.872	
37	SSA1		.934
38	SSA2		.843
39	SSA3		
40	SSA4		

	Satisfaction with Service Delivery	.900	
41	SSD1		.709
42	SSD2		.612
43	SSD3		
44	SSD4		.587

Source: Field Survey, 2023

The data obtained from the online field survey was analysed using descriptive and inferential analysis (regression model). The broad model is specified below:

$CP = \beta_0 + \beta_1 EVC + \varepsilon$…… 1

In this equation:

CP represents the customer preferences, which are measured using appropriate indicators like satisfaction with service responsiveness; satisfaction with service agility and satisfaction with service delivery.

EVC represents the enterprise value chain.

β0 is the coefficient.

ε represents the error term

The specific model equations are:

$SSR = \beta_0 + \beta_1 MSI + \beta_2 ORP + \beta_3 ORR + \beta_4 OPY + \beta_5 HCD + \beta_6 ERS + \beta_7 PEN + \beta_8 CFN + \varepsilon$… 2

$SSA = \beta_0 + \beta_1 MSI + \beta_2 ORP + \beta_3 ORR + \beta_4 OPY + \varepsilon$…… 3

$SSD = \beta_0 + \beta_1 HCD + \beta_2 ERS + \beta_3 PEN + \beta_4 CFN + \varepsilon$…… 4

Where,

MSI= Materials inventory

ORP= Order processing

ORR= Order revising

OPY= Order proactivity

HCD= Human Capital Development

ERS= Employee Relations

PEN= Process Evaluation

CFS= Customer Focus

SSR= Satisfaction with Service Responsiveness

SSA= Satisfaction with Service Agility

SSD= Satisfaction with Service Delivery

ε= Stochastic error

Data Analyses and Results

Table 2. Participants' profile

Profile	**Response**	**No.**	**Percent**
Gender	Male	170	58.02
	Female	123	41.98
Age Category	18—29	85	29.01
	30—41	69	23.55
	42—53	129	44.03
	54 years and above	10	3.41
Marital Status	Single	90	30.72

	Married	156	53.24
	Divorced	15	5.11
	Separated	32	10.92

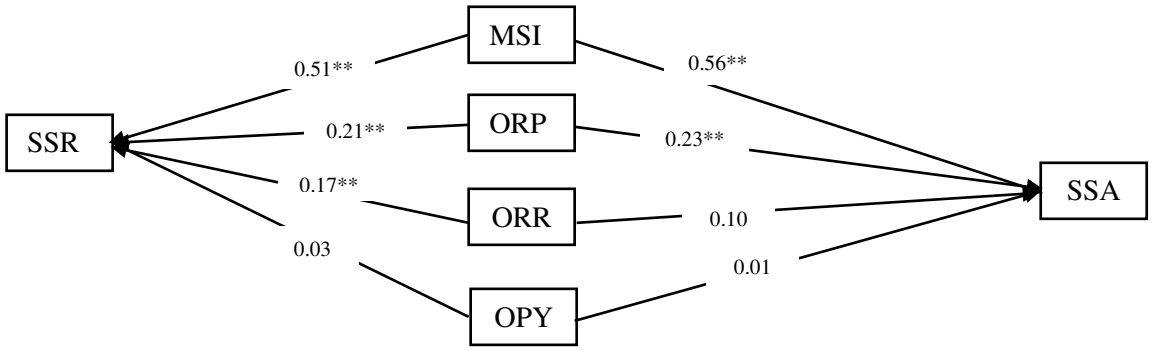
Source: Field Survey (2023)

Table 2 presents the profile of the study participants. The gender distribution of the participants reveals a slight majority of males, constituting 58.02%, while females make up 41.98% of the respondents. This indicates a relatively balanced representation of both genders in the study.

The age categories provide a nuanced perspective on the participant composition. The largest segment falls within the 42—53 age range, comprising 44.03% of the respondents. The age groups of 18—29 and 30—41 follow closely, representing 29.01% and 23.55%, respectively. The smallest segment consists of participants aged 54 and above, making up 3.41% of the participants. This distribution suggests a diverse age range among the respondents.

Regarding marital status, a significant portion of the participants are married, accounting for 53.24%. Single individuals make up 30.72% of the respondents, while divorced and separated participants constitute 5.11% and 10.92%, respectively. This distribution indicates a varied marital status among the study participants.

Figure 3 Regression Model



Source: Authors

Table 3 Material requirements planning and customer satisfaction

	Model 1				**Model 2**			
	Coef	**Std. Error**	**t-Statistic**	**P-value**	**Coef**	**Std. Error**	**t-Statistic**	**P-value**
C	0.558008	0.135493	4.118359	0.0000	0.558109	0.154394	3.614835	0.0004
MSI	0.511905	0.050698	10.09723	0.0000	0.561817	0.057770	9.725079	0.0000
ORP	0.214078	0.050226	4.262332	0.0000	0.230095	0.057232	4.020379	0.0001
ORR	0.174020	0.061061	2.849945	0.0047	0.104119	0.069579	1.496413	0.1356
OPY	-0.032090	0.064590	-0.496833	0.6197	-0.017804	0.073600	-0.241906	0.8090
R-squared	0.609133				0.569067			
Adjusted R-	0.603686				0.563061			

squared								
S.E. of regression	0.835229				0.951744			
Sum squared resid	200.2134				259.9694			
Log likelihood	-359.2340				-397.3663			
F-statistic	111.8165				94.74905			
Prob(F-statistic)	0.000000				0.000000			
Mean dependent var	3.051370				3.113014			
S.D. dependent var	1.326740				1.439825			
Durbin-Watson stat	2.203464				2.286175			

Note: The dependent variable for model 1 is satisfaction with service responsiveness; the dependent variable for model 2 is satisfaction with service agility.

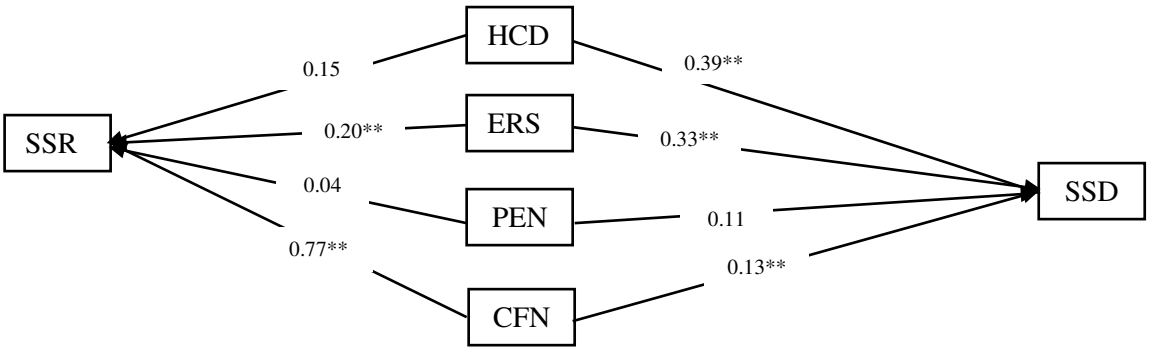
In Table 3, the R2-value of 0.609133 shows that about 60.91% of the variability in customer satisfaction with service responsiveness is explained by the variables of material requirements in the model 1. The remaining 39.09% unaccounted variability shows that other variables not captured in model 1 can also explain the variations in customer satisfaction with service responsiveness. The large F-statistic (111.8165) with a low p-value indicates that the model is overall significant. The Durbin-Watson value of 2.203464 suggests that there is no issue of autocorrelation in model 1.The R2-value of 0.569067 shows that about 56.91% of the variability in customer satisfaction with service agility is explained by the variables of material requirements in the model 2. The remaining 43.09% unaccounted variability shows that other variables not captured in model 1 can also explain the variations in customer satisfaction with service agility. The large F-statistic (94.74905) with a low p-value indicates that the model is overall significant. The Durbin-Watson statistic (2.286175) tests for the presence of autocorrelation in the residuals, and it suggests that there is no autocorrelation in model 2.

The table shows that coefficients representing the estimated impact of each independent variable on the dependent variable. In the model 1, the coefficient for "C" is 0.558008, and this depicts that holding all other variables constant, a one-unit increase in "C" is associated with an increase of 0.558008 units in customer satisfaction with service responsiveness. The t-statistic for "materials inventory" in model 1 is 10.09723, indicating a highly significant relationship. The result for materials inventory (β= 0.511905; p-value < 0.01) shows that a one-unit increase in materials inventory is associated with an increase of 0.511905 units in customer satisfaction with service responsiveness.The coefficient for order processing (β= 0.214078; p-value < 0.01) shows thata one-unit increase in order processing will lead to an increase of 0.214078 units in customer satisfaction with service responsiveness. The p-value is less than 0.01, suggesting that order processing is statistically significant in predicting customer satisfaction with service responsiveness. The coefficientfor order revising (β= 0.174020; p-value < 0.01) similarly proves thata one-unit increase in order revising will lead to an increase of 0.174020 units in customer satisfaction with service responsiveness. The p-value is below the conventional significance level of 0.05, indicating that the coefficient for order revising is statistically significant in predicting customer satisfaction with service

responsiveness. The coefficient for order proactivity (β= -0.032090; p-value >0.05) shows that a one-unit increase in order proactivity is associated with a decrease of 0.032090 units in customer satisfaction with service responsiveness. Nonetheless, the p-value is much higher than 0.05, indicating that order proactivity is not statistically significant in predicting customer satisfaction with service responsiveness.

In the model 2, the coefficient for "C" is 0.558109, also indicating that holding all other variables constant, a one-unit increase in "C" is associated with an increase of 0.558109 units in customer satisfaction with service agility. The t-statistic for "materials inventory" in model 2 is 9.725079, indicating a highly significant relationship.The table shows materials inventory (β= 0.561817; p-value < 0.01). This means that holding all other variables constant, a one-unit increase in materials inventory is associated with an increase of 0.561817 units in customer satisfaction with service agility.The p-value is less than 0.01, indicating a strong evidence against the null hypothesis. That is, materials inventory is statistically significant in predicting customer satisfaction with service agility. The result shows the coefficient for order processing(β= 0.230095; p-value < 0.01).This implies that a one-unit increase in order processingwill lead to an increase of 0.230095 units in customer satisfaction with service agility. The p-value is very low, suggesting that order processing is statistically significant in predicting customer satisfaction with service agility.The result shows the coefficient for order revising(β= 0.104119; p-value > 0.05).This shows that a one-unit increase in order revising will result to an increase of 0.104119 units in customer satisfaction with service agility. The p-value is higher than the conventional significance level of 0.05, suggesting that the coefficient for order revising is not statistically significant in predicting customer satisfaction with service agility. The result also shows the coefficient for order proactivity(β= -0.017804; p-value > 0.05). That is,a one-unit increase in order proactivity is associated with a decrease of 0.017804 units in customer satisfaction with service agility.The p-value is much higher than 0.05, indicating that the coefficient for order proactivity is not statistically significant in predicting customer satisfaction with service agility.

Figure 4 Regression Model



Source: Authors

Table 4 TQM and customer satisfaction

	Model 1				**Model 2**			
	Coef	**Std. Error**	**t-Statistic**	**P-value**	**Coef**	**Std. Error**	**t-Statistic**	**P-value**
C	0.274517	0.130743	2.099666	0.0366	0.143270	0.087311	1.640913	0.1019
HCD	-0.149676	0.095598	-1.565681	0.1185	0.390300	0.063841	6.113642	0.0000
ERS	0.202102	0.083961	2.407080	0.0167	0.331274	0.056070	5.908233	0.0000

PEN	0.036595	0.107346	0.340903	0.7334	0.105029	0.071686	1.465116	0.1440
CFS	0.765575	0.075322	10.16401	0.0000	0.127325	0.050301	2.531286	0.0119
R-squared	0.665402				0.840556			
Adjusted R-squared	0.660739				0.838334			
S.E. of regression	0.772775				0.516063			
Sum squared resid	171.3908				76.43415			
Log likelihood	-336.5402				-218.6427			
F-statistic	142.6866				378.2521			
Prob(F-statistic)	0.000000				0.000000			
Mean dependent var	3.051370				3.318493			
S.D. dependent var	1.326740				1.283493			
Durbin-Watson stat	1.720990				2.169249			

Note: The dependent variable for model 1 is customer satisfaction with service responsiveness; the dependent variable for model 2 is customer satisfaction with service delivery.

The table 4 shows the R^2 of 0.665402 for model 1. This implies that about 66.54% of the variability in customer satisfaction with service responsiveness is explained by TQM in the model. The remaining 33.46% reveals that there are other variables outside the model 1 that can account for the variations in customer satisfaction with service responsiveness. The F-statistic test (142.6866) shows the overall significance of the regression model. The large F-statistic with a low p-value indicates that the model is overall significant. The Durbin-Watson statistic tests for the presence of autocorrelation in the residuals, indicating no issue of autocorrelation with a value of 1.720990.In the model 2, the R^2 of 0.840556 indicating that about 84.06% of the variability in customer satisfaction with service delivery is explained by TQM. The unaccounted 15.94% shows that other variables that can also explain the variations in customer satisfaction with service delivery are not captured in model 2. The F-statistic (378.2521) with the low p-value also indicates that the model is overall significant. The Durbin-Watson statistic shows the value of 2.169249, indicating no issue of autocorrelation.

This table (for model 1) shows the coefficient (β= 0.274517; p-value< 0.05) for the intercept of customer satisfaction with service responsiveness when all other variables are zero. Thecoefficient (β= -0.149676; p-value> 0.05)holds all other variables constant, indicating that a one-unit increase in HCD is associated with a decrease of 0.149676 units in customer satisfaction with service responsiveness.This presents the estimated effect of HCD on the customer satisfaction with service responsiveness. The p-value greater than 0.05 typically indicates that the coefficient is not statistically significant at the 5% significance level. In practical terms, this implies that there is not enough evidence to prove that HCD has a significant negative effect on customer satisfaction with service responsiveness.Thecoefficient (β= 0.202102; p-value< 0.05) shows thata one-unit increase in employee relations is associated with an increase of 0.202102 units in customer satisfaction with service responsiveness. This reveals the estimated effect of

employee relations on customer satisfaction with service responsiveness. The p-value less than 0.05 is considered statistically significant at the 5% significance level. This implies that there is evidence to prove that employee relations have a significant positive effect on customer satisfaction with service responsiveness. The result shows coefficient (β= 0.036595; p-value< 0.05), indicating the impact of a one-unit increase in process evaluation on customer satisfaction with service responsiveness is 0.036595 units. However, the p-value shows that the impact is not statistically significant. The coefficient (β= 0.765575; p-value< 0.05) indicates thata one-unit increase in customer focus is associated with an increase of 0.765575 units in customer satisfaction with service responsiveness. This represents the estimated effect of customer focus on customer satisfaction with service responsiveness. The p-value less than 0.05 is considered statistically significant at the 5% significance level, and this means that there is evidence to prove that customer focus has a statistically significant effect on customer satisfaction with service responsiveness.

For model 2, the table shows the coefficient (β= 0.143270; p-value> 0.05) for the baseline level of customer satisfaction with service delivery when all other independent variables are zero. The coefficient (β= 0.390300; p-value< 0.05)shows that a one-unit increase in HCD is associated with an increase of 0.390300 units in customer satisfaction with service delivery. This represents the estimated effect of HCD on customer satisfaction with service delivery. This implies a positive relationship. The p-value shows that there is evidence to prove that HCD has a significant positive effect on customer satisfaction with service delivery. The coefficient (β= 0.331274; p-value< 0.05) shows that a one-unit increase in employee relations is associated with an increase of 0.331274 units in customer satisfaction with service delivery. This shows the estimated effect of employee relations on customer satisfaction with service delivery. This indicates a positive relationship. The p-value less than 0.05 typically indicates that the coefficient is statistically significant at the 5% significance level. This means that there is enough evidence to prove that employee relations has a significant positive effect on customer satisfaction with service delivery. The coefficient (β= 0.105029; p-value> 0.05) shows the effect of a one-unit increase in process evaluation on customer satisfaction with service delivery is 0.105029 units. The p-value is greater than 0.05 typically indicates that the coefficient is not statistically significant at the 5% significance level. In practical terms, this implies that there is no enough evidence to prove that there is effect of "process evaluation" on customer satisfaction with service delivery. The coefficient (β= 0.127325; p-value< 0.05) shows that a one-unit increase in customer focus is associated with an increase of 0.127325 units in customer satisfaction with service delivery. This represents the estimated effect of customer focus on customer satisfaction with service delivery. This indicates a positive relationship. The p-value is less than 0.05, meaning that there is evidence to prove that customer focus has a significant positive effect on customer satisfaction with service delivery.

Discussion of Findings

The study reveals that materials inventory, order processing, and order revising have significant positive effects on customer satisfaction with service responsiveness within the Nigerian pharmaceutical industry. This advances the finding of Akinlabi (2021) that inventory shrinkage significantly but negatively affects customer's satisfaction. This implies that efficient management of materials inventory, streamlined order processing, and a systematic approach to order revisions contribute significantly to enhancing the responsiveness of pharmaceutical services. Haji et al. (2020) and Uvet (2020) asserted that customers are more satisfied when these aspects of the value chain are effectively managed, indicating the importance of operational efficiency in meeting customer expectations for timely and responsive service. Contrastingly, the study finds that order proactivity has an insignificant negative effect on customer satisfaction with service responsiveness. This suggests that a proactive approach to handling orders does not significantly affect customer satisfaction in terms of service responsiveness. The reasons for this could be multifaceted, including potential misalignment between the perceived benefits of order proactivity and

customer expectations or the need for more personalized and tailored approaches to meet customer demands.

Findings revealed that materials inventory, order processing, and order revising have significant positive effects on customer satisfaction with service agility in the pharmaceutical industry. This implies that a well-managed materials inventory, streamlined order processing, and effective order revising contribute significantly to enhancing the agility of pharmaceutical services. Oladokun and Olaitan(2012) established that customers are more satisfied when the value chain is agile, allowing for quick and flexible responses to their needs. This aligns with the industry's demand for adaptability and responsiveness to dynamic market conditions. On the other hand, the study found that order proactivity has an insignificant negative effect on customer satisfaction with service agility. Similar to the findings related to service responsiveness, this suggests that a proactive approach to handling orders may not significantly contribute to customer satisfaction in terms of service agility. The industry may need to reassess the strategies employed for order proactivity to ensure better alignment with customer expectations and preferences for agile service delivery.

Finding showed that HCD has an insignificant negative effect on customer satisfaction with service responsiveness. This advances the finding of Nafiu and Nafiu (2023) that HCD can significantly induce satisfaction. This implies that, contrary to expectations, investments in employee skill development, training, and education do not significantly influence customers' perceptions of how responsive the service is. This may indicate a misalignment between the skills acquired through HCD initiatives and the specific aspects of service responsiveness that customers value or prioritize. On a positive note, the study found that employee-related factors, process evaluation, and customer focus have significant positive effects on customer satisfaction with service responsiveness. This implies that when employees are engaged, processes are systematically evaluated, and there is a strong customer-centric approach, customers are more likely to perceive the services as responsive.

The positive effects observed for HCD, employee relations, and customer focus on customer satisfaction with service delivery indicate that investments in employee development, fostering positive employee relations, and maintaining a customer-centric focus significantly contribute to overall customer satisfaction with the service. This suggests that not only individual aspects but a combination of these factors plays a role in shaping customers' perceptions of the service delivery experience. The finding that process evaluation has an insignificant negative effect on customer satisfaction with service delivery raises interesting considerations. It suggests that, contrary to expectations, a rigorous evaluation of internal processes does not significantly impact how customers perceive the overall service delivery.

Conclusion and Recommendations

This study sheds light on the intricate relationship between enterprise value chain processes and customer satisfaction in the Nigerian pharmaceutical industry. The identified factors influencing service responsiveness and agility provide valuable insights for industry practitioners aiming to enhance customer experiences.

Pharmaceutical companies should prioritize efficient materials inventory management, streamlined order processing, and effective order revising to enhance customer satisfaction with service responsiveness and agility. The finding related to order proactivity suggests that there is need for a reevaluation of strategies. Companies should explore customer feedback and preferences to tailor their approaches to order management. Continuous monitoring and adaptation of value chain processes are essential to align with evolving customer expectations and industry dynamics.

Organizations should carefully evaluate the specific skills and competencies developed through HCD initiatives to ensure alignment with customer expectations for service responsiveness. They should emphasise on employee engagement, positive employee relations, and maintaining a customer-centric focus to enhance customer satisfaction with both service responsiveness and service delivery. Continuous monitoring and adjustment of internal processes are essential. While rigorous process evaluation is valuable for organizational efficiency, other customer-centric factors may play a more significant role in shaping overall satisfaction with service delivery.

Implications

The positive effects observed for materials inventory, order processing, and order revising highlight key areas where pharmaceutical companies can focus their efforts to enhance customer satisfaction. However, the insignificant negative effect of order proactivity highlights the importance of understanding customer expectations and tailoring strategies accordingly. The implication is that a one-size-fits-all approach may not be effective, and a more nuanced understanding of customer preferences is crucial in optimizing the pharmaceutical value chain for both responsiveness and agility.

References

1. *Abbas, J. (2020). Impact of total quality management on corporate green performance through the mediating role of corporate social responsibility. Journal of Cleaner Production, 242, 118458.*
2. *Adebiyi, S. O., Shitta, H. A., & Olonade, O. P. (2016). Determinants of customer preference and satisfaction with Nigerian mobile telecommunication services. Journal of Management Research, 8 (1).*
3. *Ahn, J., & Black, K. (2018). Influence of brand relationship on customer attitude toward integrated resort brands: A cognitive, affective, and conative perspective. Journal of Travel & Tourism Marketing, 35(4), 449-460.*
4. *Aigbavboa, S. &Mbohwa, C. (2020). The headache of medicines' supply in Nigeria: An exploratory study on the most critical challenges of pharmaceutical outbound value chains. Procedia Manufacturing, 43, 336-343*
5. *Akinlabi, B. H. (2021). Effect of Inventory Management Practices on Operational Performance of Flour Milling Companies in Nigeria. International Academy Journal of Management, Marketing and Entrepreneurial Studies, 8(2), 137-174.*
6. *Alozie, C., Ideh, A. & Ifelunini, I. (2020). Coronavirus (COVID-19) pandemic, economic consequences and strategies for ameliorting macroeconomic shocks in Nigeria's economy. Retrieved from SSRN: on June 30, 2021.*
7. *Aninwike, C.O. (2020). Enterprise value chain and customer preferences in the Nigerian pharmaceutical industry: Empirical lacuna and research agenda. Paper presented at the First Sustainable Empirical Environmental Research International Virtual eConference 2020.*
8. *Arnold, D. G., & Oakley, J. L. (2019). Self-Regulation in the pharmaceutical industry: The exposure of children and adolescents to erectile dysfunction commercials. J Health Polit Policy Law, 44 (5), 765–787.*
9. *Arqawi, S., & Zaid, A. A. (2020). The impact of total quality management on the institution performance mediating role of knowledge management. International Journal of Advanced Science and Technology, 29 (7s), 5269, 5277.*

10. *Azzamouri, A. Baptiste, P., Dessevre, G., & Pellerin, R. (2021). Demand driven material requirements planning (DDMRP): A systematic review and classification. Journal of Industrial Engineering and Management, 14(3), 439-456..*
11. *Burton, J., Story, V., Zolkiewski, J., Raddats, C., Baines, T. S., & Medway, D. (2016). Identifying tensions in the servitized value chain. Research-Technology Management, 59(5), 38-47. .*
12. *Černikovaitė, M, Karazijienė, Z., Bivainienė, L., & Dambrava, V. (2021). Assessing customer preferences for shopping centers: Effects of functional and communication factors. Sustainability, 13(6).*
13. *Charles-Owaba, O. E., & Oladokun, V. O. (2007). A sub-tour-free set-sequencing algorithm based computer software for solving the machine setup problem. Nigerian Journal of Engineering Research and Development, 6(4), 1-10.*
14. *Chassagnol, F., Marcelli, G., Wagle, J., Giuliani, G., Traub, D., Schaub, V., & Ruof, J. (2020). Review of relative effectiveness assessments of pharmaceuticals at the European network for health technology assessment: A first step towards a consolidated European perspective on comparative effectiveness & safety?. Health Policy, 124, (9), 943-951.*
15. *Chiarini, A. (2020). Industry 4.0, quality management and TQM world. A systematic literature review and a proposed agenda for further research. The TQM Journal, 32(4), 603-616..*
16. *Cohen, P. (2011). Deming's 14 points realisation. Archived from the original on February 18, 2011. Retrieved June 25, 2011.*
17. *Ding, S., Wang, Z., Wu, D., & Olson, D. L. (2017). Utilizing customer satisfaction in ranking prediction for personalized cloud service selection. Decision Support Systems, 93, 1-10.*
18. *Elaho, B., & Ejechi, J. (2019). Production planning and customer satisfaction in table water companies in Edo State. European Journal of Business and Management, 11(17).*
19. *Eniola, A. A., Olorunleke, G. K., Akintimehin, O. O., Ojeka, J. D., & Oyetunji, B. (2019). The impact of organizational culture on total quality management in SMEs in Nigeria. Heliyon, 5(8), e02293.*
20. *Franco-Santos, M., Kennerley, M., Micheli, P., Martinez, V., Mason, S., Marr, B., Gray, D., & Neely, A. (2007). Towards a definition of a business performance measurement system. International Journal of Operations & Production Management, 27(8), 784-801..*
21. *Gerassimidou, S., Lovat, E., Ebner, N., You, W., Giakoumis, T., Martin, O. V., & Iacovidou, E. (2022). Unpacking the complexity of the UK plastic packaging value chain: A stakeholder perspective. Sustainable Production and Consumption, 30, 657-673.*
22. *Haji, M., Kerbache, L., Muhammad, M., & Al-Ansari, T. (2020). Roles of Technology in Improving Perishable Food Supply Chains. Logistics, 4(4), 1-24.*
23. *Hines, P. (1993). Integrated materials management: the value chain redefined. InternationalJournal of Logistics management,4(1),13- 22.*
24. *Hines, P., Holweg, M. and Rich, N. (2004). Learning to evolve: A review of contemporary lean thinking. International Journal of Operations & Production Management, 24(10), 994-1011.*
25. *Ilyas, R. M., Banwet, D. K., & Shankar, R. (2006). Value chain relationship: A strategy matrix supply chain forum. An International Journal, 7(2).*
26. *Inaloo, .,Zarei, A.&Zeinolabedini, M. (2018). Examination of SAVE marketing mix situation in public libraries of Tehran. Library Philosophy and Practice: 1-16.*
27. *Jiang, H., Kwong, C. K., Kremer, G., & Park, W. (2019). Dynamic modelling of customer preferences for product design using DENFIS and opinion mining. Advanced Engineering Informatics, 42.*
28. *Kapeleris, J., Hine, D. & Barnard, R. (2004). Towards definition of the global biotechnology value chain using ca*
29. *Kaplinski, R., & Morris, M. (2013). A handbook for value chain research. Canada: International Development Research Centre.*
30. *Klantschnig, G. & Huang, C. (2019). Fake drugs: Health, wealth and regulation in Nigeria. Review of African Political Economy, 46: 161, 442-458,*

31. *Kumar, D., & Rajeev P. V. (2016). Value chain: A conceptual framework. International Journal of Engineering and Management Sciences, 7(1), 74-77.*
32. *Lynn, A. F. (2006). Material requirement planning tinkertoy lawn mower activity, teaching brief. Decision Sciences Journal of Innovative Education, 4(1).*
33. *McDermott, O., Jiju, A., Michael, S., & Daly, S. (2022). Barriers and enablers for continuous improvement methodologies within the Irish pharmaceutical industry. Processes, 10(1).*
34. *McKelvey, M. & Orsenigo, L. (2001). Pharmaceuticals as a sectoral innovation system. Bocconi University, Milan, Italy.*
35. *Mina, J., Subia, G. & Ermita, P. (2020). Value chain analysis of slipper industry in the footwear capital of the North. International Journal of Supply Chain Management, 9(5): 178.*
36. *Nafiu, A.T. & Nafiu, I. O. (2023), Diversity Towards the Human Capital Development and Staff Job Satisfaction in Tertiary Institutions in Kogi State. Innovare Journal of Education, 11(2), 43-48.*
37. *National Academies of Sciences, Engineering, and Medicine, Health and Medicine Division. (2018). Crossing the global quality chasm: Improving health care worldwide. Washington: The National Academies Press*
38. *Neap, H. S., & Celik, T. (1999). Value of a product: A definition. International Journal of Value-Based Management, 12, 181–191.*
39. *Ogbo, A. I., Attah, E. Y., Ewurum, U. J., & Ugbam, C. O. (2015). Business process reengineering and performance of commercial banks in North Central Nigeria. International Journal of Contemporary Applied Sciences, 2(10): 1-13.*
40. *Ogedengbe, T. I., Adejuyiqbe, S. B., & Aderoba, A. A. (2002). Adoption of computer integrated manufacturing in Nigeria. Nigerian Journal of Engineering Management 3(3), 10-17.*
41. *Oladokun, V. O., & Olaitan, O. A. (2012). Development of a materials requirements planning software. The Pacific Journal of Science and Technology,13(1).*
42. *Olartan. O. A. (2008). Development of a materials requirements planning software for manufacturing industries (B.Sc project). University Of Ibadan, Ibadan, Oyo State, Nigeria.*
43. *Ozgur, S, K., Serkan, Y, M., & Suleyman, E. (2006). Using artificial intelligence in matenal requirement planning. Proceedings of 5th International Symposium on Intelligent Manufacturing Systems 11.*
44. *Porter, M. E. (1985). Competitive advantage: Creating and sustaining superior performance. New York: Simon and Schuster.*
45. *Prasetyo, P. & Dzaki, F. (2020). Institutional performance and new product development value chain for entrepreneurial competitive advantage. Uncertain Supply Chain Management, 8(4), 753-760*
46. *Razak, A.,Vattikoti, K. (2018). Critical evaluation of value chain analysis for assessing competitive advantage – A study on select companies of e-tailing industry. Academy of Strategic Management Journal, 17(6), 1-14.*
47. *Richey, L. A., & Ponte, S. (2021). Brand Aid and coffee value chain development interventions: Is Starbucks working aid out of business? World Development, 143, 105193.*
48. *Sahoo, D., & Pillai, S. (2017). Role of mobile banking service scape on customer attitude and engagement: An empirical investigation in India. International Journal of Bank Marketing, 35(7) 1115-1132.*
49. *Schneider, B., Macey, W. H., Lee, W. C., & Young, S. A. (2009). Organizational service climate drivers of the American customer satisfaction index and financial and market performance. Journal of Service Research, 12(1), 3–14.*
50. *Schuster, E. W, Allen, S. J., & D'itri, M. P. (2000). Capacitated materials requirements planning and its application in the process industries. Journal of Business Logistics, 12.*
51. *ses from Australian biotechnology SMEs. International Journal Globalisation and Small Business, 1(1), 79–91.*
52. *Simatupang, T.M., Piboonrungroj, P., & Williams, S. J. (2017). The emergence of value chain thinking. Int. J. Value Chain Management, 10(3).*

53. *Sivula, A., & Kantola, J. (2014). Combining crowdsourcing and porter's value chain. International Journal of Advanced Logistics, 3(2), 17-26.*
54. *Strakova, J., Rajiani, I., Pártlová, P., Váchal, J., & Dobrovič. J. (2020). Use of the value chain in the process of generating a sustainable business strategy on the example of manufacturing and industrial enterprises in the Czech Republic.Sustainability, 12(4).*
55. *Uvet, H. (2020). Importance of Logistics Service Quality in Customer Satisfaction: An Empirical Study. Operations and Supply Chain Management: An International Journal, 13(1), 1-10*
56. *Walters, D., & Lancaster, G. (2000). Implementing value strategy through the value chain. Management Decision, 38(3), 160-178.*
57. *Wang, Q., Zhao, X., & Voss, C. (2016). Customer orientation and innovation: A comparative study of manufacturing and service firms. International Journal of Production Economics, 171(2), 221-230*
58. *Wani, T. (2013). From 4Ps to SAVE: A theoritical analysis of various marketing mix models. Business Sciences International Research Journal, 1(1). World Health Organization (2004). Equitable access to essential medicines: A framework for collective action. WHO Policy Perspectives on Medicines, 8.*
59. *Yoon, B., Chung, Y., & Jun, K. (2020). Restaurant industry practices to promote healthy sustainable eating: a content analysis of restaurant websites using the value chain approach. Sustainability, 12(17), 7127.*