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Open Innovation Strategies and Organizational Effectiveness: A Study of Bottling Companies in Port Harcourt

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Abstract

This research investigates the influence of open innovation strategies on organizational effectiveness in bottling companies in Port Harcourt, Rivers State, Nigeria. Rooted in the Innovation Diffusion Theory and Resource-Based View, it examines the means organizations combine outside partnerships, knowledge, and technological developments to enhance competencies and competitive advantage. A measurable, cross-sectional method was utilized, gathering information from 131 managers and innovation personnel across 18 bottling businesses. Results reveal that open innovation abstemiously improves active effectiveness, market attractiveness, and product advancement (mean = 3.10); nevertheless, its success differs across organizations. Main challenges to implementation comprise monetary limitations, confrontation to modification, incomplete teamwork, knowledgeable asset risks, and supervisory limitations (mean = 0.47–0.49). Outward collaborations, particularly with clients and academies, show a serious character in compelling innovation and flexibility. The analysis focuses a reasonable possible for grading open innovation in Nigeria's bottling business (mean = 3.04), with government procedures, expertise implementation, and Research and Development venture as important enablers. Nevertheless, inconsistency in replies (SD = 1.39) proposes rough willingness within the area. To exploit the assistances of open innovation, businesses must substitute trust, increase investor commitment, as well as device abetting strategies. This study supports the innovation management conversation in developing businesses by contributing intuitions into the adaptability of open innovation strategies. It therefore recommends raise in financial assistance, a partnership firm principle, obvious knowledgeable asset guidelines, and reinforced outside collaborations to improve innovation and withstand lengthy attractiveness.

Keywords: *Open innovation, Innovation strategies, Organizational effectiveness, Competitive advantage, Knowledge-sharing, External collaboration, Organizational efficiency*

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Background to the Study

Envision a future where companies pool their internal resources and knowledge with an extensive network of outside experts to innovate. While this agrees with the findings that innovation strategies should be closely tied to business models, it does note the dearth of research into the actual results that organisations see when they do so in specific regions (Ngo's 2023). Open innovation strategies set businesses up for long-term success in this age of fast technology advancements and changing market dynamics, while companies that fight collaboration run the risk of becoming irrelevant. Additionally, networks of top management teams (TMTs) are essential for promoting open innovation, especially in industries where consumer tastes change at a rapid pace (Zhou & Yang 2024). Any successful organisation relies on innovation. Companies that don't adapt to the changing business landscape by embracing innovation often fall behind in the race to stay competitive. Firms are increasingly turning to open innovation, a strategy that promotes external collaborations and knowledge-sharing, as a means to improve their operational efficiency and overall effectiveness. Furthermore, Uto et al. (2024) do not go into great detail about the ways in which bottling businesses apply knowledge management to stimulate innovation. To enhance innovation processes, products, and business models, open innovation strategies advocate for utilizing both internal and external ideas. By bringing together stakeholders like as consumers, suppliers, universities, and even rivals, open innovation encourages collaboration rather than dependence on internal knowledge alone. For many businesses around the world, this tactic has been revolutionary, especially in fast-paced, ever-evolving fields like bottling. When it comes to bottling companies, open innovation can take many forms. One is working with local farmers to source fresh ingredients in a sustainable way; another is using customer feedback to create new menu items. Still another is forming partnerships with technology providers to streamline operations.

According to Nawaz (2020), an organisation is considered effective when it can achieve its strategic goals via the efficient use of its resources and when it can effectively adapt to both internal and external changes. Organizational effectiveness refers to the degree to which an organization achieves its intended goals and objectives efficiently and sustainably. More so, organizations that invest in lifelong learning and continuous improvement are better positioned to enhance their effectiveness (Vithayaporn 2021). Growing competition, technological advancement, and changing customer demand are the underlying reasons for organizations' increasing challenges in the global market. Scholars and practitioners have highlighted the importance of organizational effectiveness (OE) in addressing these challenges (Ahmad, et al, 2023). Enhancing organizational effectiveness can ensure organizational success through better management that can reduce cost, improve customer relations, increase corporate value, enhance employee performance, and provide better use of technology. However, enhancing effectiveness has emerged as a significant challenge facing organizations worldwide (Ahmad, et al, 2023). Consequently, this review seeks to problematize the complex concept of OE targeted at raising the competitiveness of organizations.

Statement of the Problem

The bottling industry in Nigeria, and Port Harcourt in particular, is quite competitive, thus staying ahead of the curve requires constant innovation. Problems that these businesses encounter include unpredictable customer tastes, lack of stability, an insufficient supply of electricity, increasing manufacturing costs, and strict government regulations. A more productive, efficient, and sustainable organisation may be within reach with the adoption of open innovation initiatives. Organisations may boost their performance by using open innovation strategies, which prioritize collaboration, sharing of information, and external alliances (Ngo, 2023) and (Simba et al. 2024). Organisational effectiveness in the local environment is significantly hindered by the absence of strategy alignment and execution of these initiatives. Their capacity to adapt to a dynamic market is compromised due to a lack of information sharing and collaborative innovation processes (Ehls et al., 2020; Zhou & Yang, 2024). The ineffective use of bottling businesses' financial, human, and operational resources is a common counterargument. A worsening of the problem is the failure to incorporate new ideas and information from outside sources, which can improve efficiency and effectiveness in the use of resources (Liu & Yang, 2024). According to Jo and Kwon (2021) and Wu and Nachiangmai (2024), a divergence occurs between service offers and consumer expectations when open innovation tactics like feedback-driven product development and co-creation with customers are not extensively used.

Selected bottling enterprises in Port Harcourt, Rivers State, Nigeria, were the focus of this study, which seeks to understand how open innovation strategies practices relate to organisational effectiveness. The research aims to identify the influence of external partnerships, knowledge-sharing, and technical improvements on these organisations' overall success by evaluating how they utilize open innovation strategies. However, there are studies on open innovation in Western nations, very little is known about how it might be applied and what effects it has on businesses in Nigeria, especially those in the bottling industry. Uncertainty over the feasibility and advantages of open innovation strategies in this environment arises because many organisations may not have the required structures, culture, or resources to properly execute it.

A lot had been written on open innovation generally, but there is still a lack of specificity on how it has been implemented in places and industries like bottling firms in Port Harcourt, Rivers State, Nigeria. Many studies have either concentrated on large tech companies or on small and medium-sized enterprises (SMEs) in industrialised nations (Wu & Nachiangmai, 2024; Simba et al., 2024). To fill that need, this study examines the organisational effectiveness of some bottling firms in Port Harcourt, Rivers State, Nigeria, and how they embrace and apply open innovation strategies. By doing so, the research gives useful insights on the role of open innovation strategies in boosting corporate sustainability and competitiveness in the Nigerian bottling sector.

Objectives of the Study

The main objectives of this study are as follows:

i. To assess the impact of open innovation strategies on organizational effectiveness

within these companies.

ii. To explore the barriers faced by bottling companies in Port Harcourt when implementing open innovation strategies.
iii. To determine the role of external collaborations (with suppliers, customers, universities, and competitors) in driving innovation and enhancing organizational effectiveness.
iv. To evaluate the potential for scaling open innovation strategies in the Nigerian bottling industry.

Research Questions

Built on the above objectives, the following research questions were extracted

i. How do open innovation strategies impact organizational effectiveness in bottling companies?
ii. What barriers do bottling companies in Port Harcourt face when implementing open innovation strategies?
iii. What role do external collaborations (with suppliers, customers, universities, and competitors) play in driving innovation and enhancing organizational effectiveness?
iv. What is the potential for scaling open innovation strategies in the Nigerian bottling industry?

Theoretical Framework

This study underpins two theories, which are indicated below:

Innovation Diffusion Theory

The process by which novel concepts, procedures, and technology propagate across a company and its many sectors is described by the Innovation Diffusion Theory. The article zeroes in on the perceived benefits, compatibility with current processes, and simplicity of use as key elements that impact the rate of innovation adoption. The idea sheds light on the communication and integration of external innovations into organisational processes within the framework of open innovation. The idea sheds light on the reasons behind the widespread use of open innovation tactics by Port Harcourt's bottling firms. The ease of integration of external knowledge into current processes and the firms' perception of its advantages will determine the rate at which open innovation approaches are adopted (Rogers, 1962). Organisational effectiveness is expected to rise for businesses that are able to effectively disseminate open ideas. The theory plays a major role in the study of "Open Innovation Strategies and Organizational Effectiveness: A Study of Bottling Companies in Port Harcourt" by offering a framework to analyze the adoption and implementation of open innovation within these firms. The application of open innovation recognizes important features such as outward advantages, orientation with prevailing procedures, and ease of implementation that stimulate how speedily innovations are incorporated within businesses. Bottling companies in Port Harcourt, Rivers State, Nigeria, are fundamentally directive of the swiftness and competence with which outside knowledge and innovative practices are combined in their operations. Open innovation flourishes on tracking and administering outward intuitions to enhance effectiveness. IDT offers an understanding of how data is circulated within and between businesses, determining the receipt, feast, and claim of open

innovation tactics in bottling companies. IDT proposes that businesses that successfully implement and circulate innovations tend to perform better. Bottling firms that seamlessly integrate open innovation are likely to achieve rewards in proficiency, cost-effectiveness, and modest positioning, as a result enhancing inclusive organizational implementation.

Resource-Based View (RBV)

A firm's competitive advantage stems from its precious, unique, inimitable, and non-substitutable resources, according to the Resource-Based View (RBV) (Barney 1991). Businesses can get advantage over their rivals by developing distinctive skills through integrating in-house resources with external ones (via open innovation). Relevant to the bottling sector in Port Harcourt, Rivers State, Nigeria, RBV stresses the significance of utilizing both physical (manufacturing equipment) and immaterial (external knowledge, partnerships) resources to propel innovation and attain exceptional organisational effectiveness. However, bottling firms in Port Harcourt may boost their organisational effectiveness by integrating external resources (open innovation) with their current resource base. This would help them gain a competitive edge and execute better overall. In other words, Resource-Based View (RBV) is very important aspect of open innovation strategies and organizational effectiveness. A study of bottling companies in Port Harcourt clarifies how businesses employ inside and outside assets to improve competitiveness as well as operation. The theory stresses that respected business, infrequent, unique, and non-substitutable (VRIN) resources are main to supporting competitiveness. In Port Harcourt's bottling industry, businesses can strengthen their marketplace by integrating inside capitals, for example, manufacturing competencies, with outside knowledge and tactical teamwork enabled by open innovation. This theory highlights the requirement of bringing together perceptible assets (such as industrial equipment) with imperceptible resources (such as collaborations, outside know-how, and progressive knowledge) to initiate innovation. By approving open innovation policies, bottling businesses can access outside services and knowledge that boost their strengths within, consequently enhancing performance. RBV asserts that organizations that effectively integrate outside capital into their prevailing competencies can advance exceptional strengths that develop competence, manufacturing, and innovation. Through open innovation, bottling organizations in Port Harcourt can develop their capital base, advance processes, reduce costs, and maintain a long-term competitive edge.

Literature Review

Open Innovation Strategies

The concept of open innovation has gained significant traction in both academic and business communities, especially as companies recognize the importance of leveraging external knowledge and ideas to drive innovation. This literature review critically and evaluates the application of open innovation strategies in enhancing organizational effectiveness, particularly within the bottling industry, focusing on Port Harcourt, Rivers State, Nigeria. The original definition of open innovation was the use of purposeful knowledge inflows and outflows to boost internal innovation and increase markets for external innovation usage, respectively. Some big businesses now have more ambitious goals for their open innovation approach (Robaczewska, et al., 2019).

Concept of Open Innovation

One of the most important factors in staying competitive in the bottling sector is open innovation. This allows organisations to tap into external expertise, partnerships, and technology to make their operations more efficient and adaptable to the market. The ever-changing business climate, regulatory environment, and competitive challenges in the Port Harcourt region make it imperative to study this in this specific context. Productivity, cost-effectiveness, and innovation in products may be better understood by analysing the effects of open innovation on organisational effectiveness. In order to be innovative, companies can no longer depend just on their own resources; they must also aggressively seek out new information and ideas from other sources. In the early 2000s, Henry Chesbrough established the notion of open innovation (Wu & Nachiangmai, 2024). The theory behind this is that companies may benefit greatly from combining internal and external ideas, which helps them grow technologically and successfully introduce items to the market (Simba et al., 2024). Digital transformation, global networks, and collaborative technologies have made it easier for enterprises to connect with many stakeholders, which has led to a trend towards openness. By encouraging collaboration with external partners and dismantling traditional boundaries, open innovation aims to build an ecosystem where knowledge, skills, and resources can be shared and used to speed up the innovation process (Zhou & Yang, 2024). This, in turn, can help a company stay ahead of the competition and improve its innovation performance in the dynamic business world.

Crowdsourcing, supplier cooperation, affiliations with academic institutions, and partnerships with rivals are additional ways to implement open innovation. Managing and integrating outside information could be difficult for bottling firms. There is a greater chance of information loss and a decline in competitiveness when innovations are shared outside. Open innovation can be impeded when there are trust concerns, cultural differences, and competing interests between corporations and their external partners. It is still difficult to provide precise measures to measure how open innovation impacts organisational success. Innovation initiatives could be constrained by supply chain constraints, local regulations, and competition laws. According to Narknonhan et al. (2022), businesses that prioritize information exchange and new ideas are more likely to foster sustainable performance through the use of creative strategies.

By allowing companies to draw from a wider range of ideas and developments, open innovation promotes creativity and enables for better problem-solving. Organisations may lower their research and development expenses and divide up the risks of innovation by working with outside parties. New items or methods can be developed and commercialised more quickly through external cooperation. A corporation runs the danger of losing its competitive edge or having its intellectual property stolen if it shares information with other parties. Lacking the appropriate absorptive ability, it can be especially challenging for a corporation to incorporate outside ideas or technology into its own organisational procedures.

Organizational Effectiveness

Successful businesses are able to accomplish their objectives, boost production, adjust to new circumstances, and maintain a competitive advantage. Indicators including market share, customer happiness, operational efficiency, and financial success are used to measure it. When it comes to increasing the efficiency of a company, studies have demonstrated that open innovation is key. A fundamental responsibility of the organisation is to maximise its efficiency. Due to individual biases and preconceptions, measuring effectiveness is challenging. An organization's efficacy can be defined as the degree to which it accomplishes its stated aims. According to Ahmad, Furuoka, and Rasiah (2023), organisational effectiveness (OE) is a non-financial factor that focusses on managing and enhancing human capital and resources. However, according to Douglas et al. (2022), organisational effectiveness (OE) is defined as the capacity to accomplish organisational goals through improving the external environment of the organisation on a regular basis, and it is not only about a company's financial health or profitability. OE is also affected by the organization's human capital.

Empirical Review

Open Innovation Strategies

It is crucial to critically evaluate previous research in order to comprehend the ideas utilized, the methodology employed, and the insights obtained when examining the empirical framework concerning open innovation strategies and their influence on organisational effectiveness. This study delves into important empirical works on open innovation strategies and organisational effectiveness, specifically looking at the bottling sector. It also seeks to understand how these studies might contribute to the research happening in Port Harcourt, Rivers State, Nigeria. An examination of the Open Ambidextrous Innovation Practices (OAIP) and Open Innovation Implementation (OII) processes as they pertain to small and medium-sized enterprises (SMEs) in Thailand. This study examines the adoption of open innovation techniques by micro, small, and medium-sized firms (SMEs) using multigroup structural invariance analysis and second-order factor analysis. The study shows that open innovation improves creativity and information exchange, and it establishes a strong positive relationship between open ambidextrous innovation practices (OAIP) and open innovation implementation (OII). Though results may vary, small and medium-sized enterprises (SMEs) of any size have a lot of promise when it comes to open innovation. To better understand how SMEs innovate, a new second-order structural model has been developed. Srisathan et al. (2023) provide practical and policy advice that highlight the importance of technological, organisational, managerial, and contextual elements in the effective implementation of open innovation.

The research looks at how open innovation affects the incorporation of digital technology in businesses, which in turn boosts their capacity for innovation and competitiveness. How companies promote digital transformation and create flexible solutions by acquiring external information, technology, and ideas is the main emphasis of the research. In order to assist businesses, integrate technology and increase efficiency, the study identifies a significant connection between digital innovation and open innovation. By easing the process of

gaining access to external information and developing internal capabilities, open innovation improves flexibility. Nevertheless, maintaining a balance between innovation and production, dealing with external collaboration, and complicated IT are all obstacles. According to Rengkung et al. (2024), businesses have the power to promote digital transformation through open innovation, while governments should foster cooperation and information sharing by creating supporting frameworks.

Organizational Effectiveness

In order to stay ahead of the competition in today's dynamic market, the research stresses the need of good organisational strategies. Through a thorough literature evaluation of 25 papers, the research highlights critical success criteria for organisations and proposes a new model for attaining strategic success. The study emphasizes three important variables that improve organisational effectiveness: business intelligence for information management, organisational agility for change adaptation (via market capitalisation and operational adjustment), and an inventive atmosphere for creativity in the workplace. If the proposed model is to be believed, these factors are fundamental to the success of any given organisation. According to Ahmad et al. (2023), managers may use these elements to improve strategic positioning, which is particularly important in unpredictable situations. On the other hand, organisations should focus on agility, business intelligence, and innovation to ensure long-term competitiveness. Using systems theory as a framework, this research investigates how efficient communication affects business results. The goals were to create a communication model to boost performance and determine what elements influence the efficacy of communication. Data was gathered from 88 participants using a questionnaire, utilizing a quantitative technique. Despite a favourable correlation between channels of communication and efficacy, the study discovered no statistically significant association between management and channels of communication. It also shown that good communication has a favourable effect on how well a company does. If managers want to boost efficiency and productivity, they need to pick the correct channels of communication. To improve performance and optimize strategies, organisations might use a communication model based on systems theory (Musheke & Phiri, 2021).

Relationship between Open Innovation Strategies and Organizational Effectiveness

This study investigates the role of organizational readiness in adopting open innovation and its impact on organizational performance. Open innovation involves external parties such as suppliers, consumers, competitors, and society, participating in the innovation process, enabling the flow of knowledge both internally and externally (inbound and outbound). The study seeks to provide an updated and comprehensive understanding of how organizational preparedness for innovation influences performance through the open innovation model. Open innovation involves external stakeholders, such as suppliers, consumers, competitors, and societal entities, which enhances an organization's ability to innovate and improve performance. Organizational readiness is crucial for successfully implementing open innovation practices. A review of 33 key articles shows that open innovation positively impacts organizational performance by facilitating better knowledge exchange, innovation, and collaboration. The study also identifies various types and practices of open innovation

that organizations use to leverage external knowledge and achieve better results (Rumanti, et al, 2021). Innovation strategy has emerged as a critical determinant of firm competitiveness, influencing organizational performance and market positioning. This empirical review aims to synthesize existing research on the effect of innovation strategy on firm competitiveness, drawing insights from studies conducted between 2015 and 2023. By analyzing key findings using the PRISMA method and descriptive content analysis, this review highlights the theoretical and empirical advancements in the field while identifying research gaps that require further exploration. A total of 40 studies were reviewed, covering various aspects of innovation strategy and its relationship with firm competitiveness. These studies were sourced from reputable databases, including Scopus, Web of Science, PubMed, and Taylor and Francis, ensuring a comprehensive examination of relevant literature (Agazu, & Kero 2024). Human factors play a crucial role in driving innovation and overall organisational effectiveness. Empirical studies suggest that elements such as work-life balance and organisational learning capability significantly impact an organisation's ability to innovate and sustain competitive advantage. Maintaining a healthy work-life balance enhances employee well-being, job satisfaction, and productivity, which in turn contributes to improved organisational outcomes. the study conducted on 354 companies in Brazil's transformation sector, confirms a positive correlation between work-life balance and organisational effectiveness.

Employees who experience better work-life integration tend to be more engaged, motivated, and committed, leading to increased efficiency and reduced turnover rates. Organisational learning capability (OLC) is another key human factor that influences innovation. The ability of an organisation to acquire, distribute, and apply knowledge fosters an environment conducive to innovation. The findings indicate that OLC is a significant determinant of both innovation performance and overall organisational effectiveness. Companies that invest in continuous learning, knowledge-sharing, and adaptive strategies are better positioned to develop new products, services, and processes that enhance market competitiveness. The study highlights that work-life balance and organisational learning capability are interrelated and collectively contribute to improved innovation and organisational effectiveness. When employees feel valued and supported, they are more likely to engage in creative problem-solving and knowledge-sharing, which drive innovation. Additionally, fostering a learning-oriented culture ensures that organisations remain agile and responsive to market changes, leading to sustained performance and growth (Ferreira, et al, 2023).

Based on the empirical studies reviewed, there are several research gaps and potential hypotheses that warrant further investigation, particularly concerning the impact of open innovation strategies on organizational effectiveness in the context of the bottling industry in Port Harcourt, Nigeria. Below are some potential research gaps and hypotheses: The studies highlight the importance of open innovation in various industries, but there is limited research on how open innovation strategies specifically affect the bottling industry in emerging economies, particularly in Nigeria. Research focused on this context could provide a deeper understanding of how open innovation translates to organizational effectiveness in this specific sector.

Methods

Research Design

Quantitative, Cross-sectional design

The study examined the relationship between open innovation strategies (independent variable) and organizational effectiveness (dependent variable) of bottling companies in Port Harcourt, Rivers State, Nigeria, providing a snapshot of current practices.

Sample Size and Selection Criteria

The study targets a sample size of 18 companies from the bottling industry in Port Harcourt, Rivers State, Nigeria which is indicated below

Table 1.

S/N	List of Bottling Companies in Port Harcourt, Rivers State, Nigeria	Numbers of Managers/Supervisors
1.	West African Glass Industry PLC (WAGI)	15
2.	Nigeria Bottling Company (NBC & COCA - COLA)	20
3.	CWAY Food and Beverages Company Ltd	10
4.	La Sien Bottling Company	10
5.	Seven-Up Bottling Company	18
6.	Ausgia Table Water	3
7.	CWAY Port Harcourt	8
8.	Binomak Nigeria Limited	5
9.	Classic Royal Table Water	2
10.	Elix Dew Water Factory	4
11.	Luyah Global Resources Manufacturer	6
12.	Ibisomini Nigeria Limited	3
13.	Iceland Table Water	2
14.	Junac Table Water	2
15.	Rufina Premium Table Water	3
16.	University of Port Harcourt Bottling Company	1
17.	Joshua Bottle Company	7
18.	AB International Breweries	12

Selection Criteria

Companies within the bottling sector operating in Port Harcourt, Rivers State, Nigeria. Companies that have either implemented or are in the process of implementing open innovation strategies as well as being operational in Port Harcourt region at least five years.

Primary Data Collection:

Structured questionnaires with closed-ended and Likert scale questions were used to collect data from managers and innovation officers within the selected companies.

Secondary Data

Annual reports and other publicly available corporate documents could provide additional insights into the companies' innovation strategies practices and effectiveness metrics.

Data Analysis Procedures
Statistical Software: SPSS (Statistical Package for the Social Sciences) was used for data analysis.

Descriptive Statistics: For summarizing the demographic data and key variables (mean, standard deviation, frequency distribution).

Table 2: Demographic Characteristics of Respondents

Variable	Category	Frequency	Percent (%)	Valid Percent (%)	Cumulative Percent (%)
Gender	Male	68	51.9	51.9	51.9
	Female	63	48.1	48.1	100.0
Age	18-25 years	32	24.4	24.4	24.4
	26-35 years	28	21.4	21.4	45.8
	36-45 years	22	16.8	16.8	62.6
	46-55 years	27	20.6	20.6	83.2
	56 years and above	22	16.8	16.8	100.0
Education Level	Bachelor's Degree	30	22.9	22.9	22.9
	Diploma/NCE	41	31.3	31.3	54.2
	Master's Degree or Higher	29	22.1	22.1	76.3
	Secondary School Certificate	31	23.7	23.7	100.0
Experience Level	Less than 1 year	37	28.2	28.2	28.2
	1-5 years	30	22.9	22.9	51.1
	6-10 years	35	26.7	26.7	77.9
	More than 10 years	29	22.1	22.1	100.0
Total Respondents		131	100.0	100.0	

An almost equal gender distribution of 51.9% male and 48.1% female respondents was identified in the study. Younger to middle-aged respondents make up a major percentage of the sample. About 24.4% are 18–25, and 21.4% are 26–35. 16.8% of responders are 36–45 years old, and 20.6% are 46–55. Additionally, 16.8% are 56+. This distribution implies a mix of younger and older workers. Diploma or NCE credentials are the most popular educational background, with 31.3% of respondents. Secondary School Certificate holders make up 23.7%, while Bachelor's Degree holders make up 22.9%. Master's degrees are held by 22.1% of respondents. It indicates that most participants have tertiary education. 28.2% of respondents had less than one year of work experience, indicating a substantial share of new hires. 22.9% have 1–5 years of experience, while 26.7% have 6–10 years. The 22.1% of responders with over 10 years of expertise are highly seasoned professionals. This distribution represents a balanced workforce of new and experienced personnel.

Descriptive Statistics

Table 3: How do open innovation strategies impact organizational effectiveness in bottling companies?

Descriptive Statistics

	N	Mean	Std. Deviation
Our company actively adopts open innovation strategies to improve operational efficiency.	131	3.02	1.444
Open innovation strategies have significantly enhanced our company's market competitiveness.	131	3.03	1.419
External partnerships have improved the effectiveness of our company's product development process.	131	2.98	1.501
Our organization leverages customer feedback to enhance innovation.	131	2.93	1.453
The implementation of open innovation has led to increased profitability and growth.	131	2.96	1.378
Valid N (listwise)	131		

The study explores open innovation strategies' role in enhancing organizational effectiveness among Port Harcourt bottling companies. Respondents moderately agree that open innovation improves operational efficiency (mean = 3.02, SD = 1.444) and market competitiveness (mean = 3.03, SD = 1.419). External partnerships moderately enhance product development (mean = 2.98, SD = 1.501), while customer feedback integration for innovation shows slight variation (mean = 2.93, SD = 1.453). Open innovation's impact on profitability and growth is acknowledged but not unanimous (mean = 2.96, SD = 1.378), reflecting varying implementation success. Overall, open innovation is seen as beneficial, though its effectiveness differs across firms.

Table 4: Cumulative Descriptive Statistics on How do open innovation strategies impact organizational effectiveness in bottling companies?

Descriptive Statistics

	N	Mean	Std. Deviation
How do open innovation strategies impact organizational effectiveness in bottling companies?	131	2.98	1.439
Valid N (listwise)	131		

The cumulative mean of 2.98 and standard deviation of 1.439 indicate moderate agreement that open innovation strategies positively impact organizational effectiveness in bottling companies, with some variability in respondents' perceptions.

Table 5: What barriers do bottling companies in Port Harcourt face when implementing open innovation strategies?

Descriptive Statistics

	N	Mean	Std. Deviation
Lack of financial resources	131	.47	.501
Resistance to change from employees	131	.47	.501
Limited collaboration with external partners	131	.48	.502
Intellectual property risks	131	.46	.500
Regulatory constraints	131	.49	.502
Others	131	.37	.486
Our company has a clear policy on handling intellectual property concerns in open innovation.	131	2.88	1.353
Lack of trust among stakeholders is a major barrier to adopting open innovation strategies.	131	3.05	1.416
Valid N (listwise)	131		

The study identified key barriers to open innovation in Port Harcourt's bottling companies. Financial constraints and employee resistance (mean = 0.47), limited external collaboration (0.48), intellectual property risks (0.46), and regulatory issues (0.49) are significant obstacles. Trust among stakeholders is a major hurdle (mean = 3.05, SD = 1.416). Intellectual property policies vary (mean = 2.88, SD = 1.353), with some companies lacking clear guidelines. These findings highlight financial limitations, resistance to change, weak partnerships, regulatory challenges, and trust issues as critical barriers to successful open innovation implementation.

Table 6: Cumulative Descriptive Statistics on What barriers do bottling companies in Port Harcourt face when implementing open innovation strategies?

Descriptive Statistics

	N	Mean	Std. Deviation
What barriers do bottling companies in Port Harcourt face when implementing open innovation strategies?	131	2.97	1.394
Valid N (listwise)	131		

The cumulative mean of 2.97 indicates moderate agreement on barriers to open innovation, with a standard deviation of 1.394 showing variability in responses. Respondents perceive challenges but with differing levels of intensity.

Table 7: What role do external collaborations (with suppliers, customers, universities, and competitors) play in driving innovation and enhancing organizational effectiveness?

Descriptive Statistics

	N	Mean	Std. Deviation
Collaboration with suppliers has improved our ability to introduce innovative products.	131	2.96	1.433
Partnering with universities and research institutions has contributed to product development and process improvement.	131	3.05	1.480
Customer insights and co-creation efforts help shape our company's innovative strategies.	131	3.33	1.333
Our company benefits from knowledge-sharing initiatives with competitors in the industry.	131	3.08	1.431
External collaborations have strengthened our company's ability to adapt to market changes.	131	3.09	1.373
Valid N (listwise)	131		

The study examines how external collaborations—with suppliers, universities, customers, and competitors—drive innovation and organizational effectiveness in Port Harcourt bottling companies. Supplier collaboration (mean: 2.96) moderately enhances innovation, while partnerships with universities (mean: 3.05) aid product and process improvements. Customer engagement (mean: 3.33) is highly valued for shaping innovation strategies. Knowledge-sharing with competitors (mean: 3.08) varies in impact, and external collaborations (mean: 3.09) strengthen adaptability to market changes. Standard deviations (1.333–1.480) indicate varying experiences across companies, highlighting the diverse benefits of these partnerships.

Table 8: Cumulative Descriptive Statistics on What role do external collaborations (with suppliers, customers, universities, and competitors) play in driving innovation and enhancing organizational effectiveness?

Descriptive Statistics

	N	Mean	Std. Deviation
What role do external collaborations (with suppliers, customers, universities, and competitors) play in driving innovation and enhancing organizational effectiveness?	131	3.10	1.411
Valid N (listwise)	131		

The cumulative mean of 3.10 and standard deviation of 1.41 indicate moderate agreement that external collaborations drive innovation and enhance organizational effectiveness, with some variability in respondents' perceptions.

Table 9: What is the potential for scaling open innovation strategies in the Nigerian bottling industry?

Descriptive Statistics

	N	Mean	Std. Deviation
There is significant potential for expanding open innovation strategies in Nigeria's bottling industry.	131	3.16	1.386
Government policies and support encourage the adoption of open innovation in the industry.	131	3.11	1.351
Technology adoption plays a key role in scaling open innovation strategies.	131	2.92	1.463
Open innovation strategies will be essential for the long-term success of bottling companies in Nigeria.	131	2.89	1.332
Increased investment in R&D and innovation hubs will accelerate open innovation practices in the industry.	131	3.14	1.429
Valid N (listwise)	131		

The study evaluates the potential for expanding open innovation in Nigeria's bottling industry, focusing on government policies, technology adoption, and R&D investment. Respondents moderately agree (mean = 3.16) that open innovation can expand, though opinions vary (SD = 1.386). Government support is seen as somewhat encouraging (mean = 3.11, SD = 1.351), but inconsistent. Technology's role in scaling innovation is less emphasized (mean = 2.92, SD = 1.463), likely due to adoption challenges. Open innovation is viewed as important for long-term success (mean = 2.89, SD = 1.332), but skepticism exists. Increased R&D investment is widely supported (mean = 3.14, SD = 1.429) to accelerate innovation practices.

Table 10: Cumulative Descriptive Statistics on What is the potential for scaling open innovation strategies in the Nigerian bottling industry?

Descriptive Statistics

	N	Mean	Std. Deviation
What is the potential for scaling open innovation strategies in the Nigerian bottling industry?	131	3.04	1.393
Valid N (listwise)	131		

The cumulative mean of 3.04 indicates moderate agreement on the potential for scaling open innovation in Nigeria's bottling industry, with a standard deviation of 1.39 reflecting variability in respondents' perceptions.

Discussion of Findings

How do open innovation strategies impact organizational effectiveness in bottling companies?

Open innovation strategies enhance organizational effectiveness by fostering knowledge exchange, creativity, and adaptability, as evidenced by Srisathan et al. (2023) and Rengkung et al. (2024). These strategies improve operational efficiency, market competitiveness, and product development, as highlighted by the cumulative mean of 3.10 in the study. However, challenges such as resistance to change and intellectual property risks (mean = 0.47) can hinder effectiveness, emphasizing the need for supportive policies and organizational readiness (Rumanti et al., 2021).

What barriers do bottling companies in Port Harcourt face when implementing open innovation strategies?

Key barriers include lack of financial resources, resistance to change, limited collaboration with external partners, and intellectual property risks (mean = 0.47–0.49). These findings align with Ahmad et al. (2023), who emphasize the importance of organizational agility and innovation climate. Additionally, regulatory constraints (mean = 0.49) and lack of trust among stakeholders (mean = 3.05) further complicate implementation, highlighting the need for improved policies and stakeholder engagement.

What role do external collaborations play in driving innovation and enhancing organizational effectiveness?

External collaborations with suppliers, universities, customers, and competitors significantly drive innovation and organizational effectiveness, as shown by the cumulative mean of 3.10. Srisathan et al. (2023) and Rengkung et al. (2024) highlight how such partnerships enhance knowledge sharing, digital transformation, and adaptability. However, challenges like IT complexities and balancing innovation with production must be addressed to maximize benefits.

What is the potential for scaling open innovation strategies in the Nigerian bottling industry?

The potential for scaling open innovation is moderate (cumulative mean = 3.04), with respondents acknowledging the role of government policies, technology adoption, and R&D investment. However, variability in responses (SD = 1.39) suggests uneven readiness across the industry. Srisathan et al. (2023) and Rumanti et al. (2021) emphasize the need for organizational readiness and supportive frameworks to fully realize this potential.

Conclusion

This study explored the impact of open innovation strategies on organizational effectiveness within bottling companies in Port Harcourt, Nigeria. The study finds that open innovation enhances organizational effectiveness in Port Harcourt's bottling companies by improving operational efficiency, market competitiveness, and product development through external collaborations. However, barriers like financial constraints, resistance to change, limited collaboration, and intellectual property risks hinder full adoption. The potential for scaling

open innovation is moderate, with government policies, technology adoption, and R&D investment as key enablers. Variability in responses highlights uneven readiness and implementation challenges. To maximize benefits, companies must foster trust, improve stakeholder engagement, and leverage supportive policies. Organizational readiness, agility, and continuous learning are crucial for sustaining innovation and long-term competitiveness. This study provides Nigerian-specific insights and practical recommendations for enhancing innovation practices and organizational effectiveness.

Recommendations

1. Governments and financial institutions should provide funding and incentives to support open innovation initiatives in the bottling industry, addressing the barrier of limited financial resources.
2. Companies should build trust among stakeholders and promote a collaborative culture to overcome resistance to change and improve external partnerships.
3. Develop clear and robust intellectual property policies to mitigate risks and encourage knowledge sharing while protecting innovations.
4. Prioritize investments in technology adoption and R&D to drive innovation and improve operational efficiency, aligning with the findings on the importance of technology and R&D.
5. Strengthen partnerships with suppliers, customers, universities, and competitors to enhance knowledge exchange and innovation capabilities.

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