DISRUPTIVE TECHNOLOGIES ON ORGANIZATIONAL PERFORMANCE OF BREWERY FIRMS IN SOUTH-SOUTH, NIGERIA

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Abstract

The study investigated the effect of disruptive technologies on organizational performance of brewery firms in South-South, Nigeria. The specific objectives were to ascertain the effect of cloud computing on operational efficiency, assess the effect of internet of things on workflow optimization of brewery firms in South-South. This study adopted the survey research design. The study adopted primary data to gather information from the respondents. The population is nine hundred and eighty-nine (989). The sample size was three hundred and seventy-four (374). This study adopted the simple stratified sampling technique. Pearson correlation coefficient were used to test the relationship dependent and independent variables of the study. A total of three hundred and seventy-four (374) copies of the questionnaire were distributed to the selected breweries firms in South-South Nigeria. Out of this number, sixty-three (63) copies of questionnaire were lost/wrongly filled with percentage ratio of 16.8% while three hundred and eleven (311) copies of questionnaire were correctly filled and returned with percentage ratio of 83.2% and this formed the basis of the study. the finding of the study that there is a positive significant effect between cloud computing and operational efficiency of brewery firms in south-south. There is a positive significant effect between internet of things and workflow optimization of brewery firms in south-south. The study concluded that brewery firms that strategically invest in and integrate modern technological innovations into their operations are more likely to achieve sustainable growth, operational excellence, competitive advantage, customer satisfaction, and long-term survival in the contemporary business environment. The study recommended that brewery firms in South-South Nigeria should invest more in cloud computing infrastructure to improve operational efficiency, data storage, communication, and accessibility of organizational information across different departments and branches.

Keywords: Disruptive Technologies, Cloud Computing, Internet of Things and Organizational Performance.

Introduction

Background to the Study

The historical trajectory of disruptive technologies in Nigeria's brewery firms therefore reflects a transition from foreign-dependent production systems to gradual technological adaptation, and more recently, to emerging digital transformation. Earlier phases were marked by limited innovation and strong reliance on external technologies, while the current phase presents opportunities for brewery firms to leapfrog into more advanced, technology-driven operations. Disruptive technologies within the brewery industry have evolved slowly but are now gaining momentum, with the potential to significantly improve production efficiency, product quality, and competitive positioning if existing structural constraints are effectively addressed (Bai & Li, 2020). Disruptive technology, in this context, does not necessarily imply entirely new inventions but refers to innovations that significantly alter brewing processes, distribution systems, and competitive dynamics. As noted by Frizzo-Barker (2020), such technologies often emerge as cost-effective and niche solutions that are initially underestimated by dominant firms. This is evident in the Nigerian

brewery industry, where early adoption of digital tools was slow due to uncertainty and perceived risks. However, as these technologies mature, they increasingly contribute to cost reduction, improved operational efficiency, and enhanced product quality. The theoretical underpinning of this transformation can be linked to Joseph Schumpeter's concept of Creative Destruction, which explains how technological innovation continuously reshapes industries by displacing outdated production methods and redefining consumer expectations.

In brewery firms, this implies that traditional brewing and distribution practices are gradually being replaced by automated, data-driven systems. Firms that fail to embrace these changes risk losing market share to more technologically advanced competitors. Within brewery organizations, disruptive technologies present both opportunities and risks. While firms often prioritize sustaining innovations such as incremental improvements in brewing techniques, they may overlook disruptive technologies that can fundamentally transform production and supply chain systems. In Nigeria, delayed response to such technologies exposes brewery firms to inefficiencies, higher operational costs, and reduced competitiveness. Consequently, firms are required to integrate adaptive technological strategies across brewing operations, logistics, and distribution networks to remain competitive (Wamba & Mishra, 2017). Although the relevance of disruptive technologies in the Nigerian brewery industry is increasing, their application remains uneven. The industry continues to face structural challenges including unreliable electricity supply, inadequate infrastructure, and dependence on imported machinery, which limit the full realization of technological benefits.

Nevertheless, emerging technologies such as AI, IoT, cloud computing, and big data analytics are beginning to reshape specific operational areas. For example, IoT-enabled systems are improving equipment monitoring and maintenance, AI-driven analytics are enhancing quality control and production planning, and cloud-based platforms are supporting integrated supply chain management (Mariani & Fosso Wamba, 2020). Despite these advancements, significant barriers persist, including high costs of implementation, lack of technical expertise, and weak innovation support systems. These challenges also have broader implications for employment and skills within the brewery industry, as automation may reduce reliance on low-skilled labor while increasing demand for specialized technical skills (Leipziger & Dodev, 2016).

In essence, the Nigerian brewery industry is at a critical transitional stage where disruptive technologies can either deepen existing operational challenges or serve as catalysts for improved performance and competitiveness. Brewery firms that strategically adopt and integrate these technologies are more likely to achieve efficiency gains, product innovation, and stronger market positioning, while those that fail to adapt risk becoming obsolete in an increasingly technology-driven and competitive industry environment. Therefore, this study tends to examine the effect of disruptive technologies on organizational performance.

Statement of the Problem

The performance of brewery companies in Nigeria has increasingly become a subject of concern, particularly in the face of rising production costs, intense market competition, fluctuating consumer demand, and operational inefficiencies. The Nigerian brewery industry, dominated by major players such as Champion Breweries Plc, Nigeria Bottling Company, International Breweries Plc, plays a significant role in the manufacturing sector through job creation, revenue generation, and contribution to GDP. However, despite this importance, many brewery firms continue to experience challenges related to cost management, production efficiency, and maintaining competitive advantage in a rapidly evolving business environment.

Globally, disruptive technologies such as artificial intelligence (AI), Internet of Things (IoT), cloud computing, and big data analytics are transforming manufacturing processes, including beverage production, by enabling automation, predictive maintenance, real-time monitoring, and data-driven decision-making. These technologies have the potential to enhance operational efficiency, reduce waste, improve product quality, and optimize supply chain management. In advanced brewing industries, digital technologies are already being used to monitor fermentation processes,

manage inventory systems, and forecast consumer demand with high accuracy.

However, the extent to which brewery companies in Nigeria have adopted and effectively utilized these disruptive technologies remains limited and uneven. While leading firms have made efforts toward process automation and digital transformation, many operational areas still rely on conventional production and management systems. This partial adoption limits the ability of these firms to fully realize the efficiency gains and competitive advantages associated with disruptive technologies. The slow adoption of disruptive technologies in Nigerian brewery companies can be attributed to several contextual challenges, including high cost of technology acquisition and maintenance, inadequate digital infrastructure, unreliable power supply, and shortage of skilled personnel capable of managing advanced technological systems. These constraints not only hinder technological integration but also affect the overall performance of firms in terms of productivity, profitability, and market responsiveness. It therefore, becomes imperative to investigate the effects that disruptive technologies have on organizational performance of brewery firms in South-South, Nigeria.

Objectives of the Study

The main objective of this study was to examine the effect of disruptive technologies on organizational performance of brewery firms in South-South, Nigeria. However, specific objectives were to:

i. Ascertain the effect of cloud computing on operational efficiency of brewery firms in South-South.
ii. Assess the effect of internet of things on workflow optimization of brewery firms in South-South.

Research Questions

To facilitate the realization of the above stated objectives, the under listed research questions were raised to guide the investigations":

i. What is the effect of cloud computing on operational efficiency of brewery firms in South-South?
ii. What is the effect of internet of things on workflow optimization of brewery firms in South-South?

Research Hypotheses

The following null hypotheses have been formulated to help draw salient inferences and conclusions at the end of the study:

HO_1: There is no positive significant effect between cloud computing and operational efficiency of brewery firms in South-South

HO_2: There is no positive significant effect between internet of things and workflow optimization of brewery firms in South-South

Review of the Related Literature

Conceptual Review

Disruptive Technology

By definition, disruptive technologies are innovative technologies that initially operate in a niche market with inferior performance but eventually redefine the market and its value proposition and displace the traditional technologies or incumbent firms. These technologies mostly begin as specialized solutions but can quickly become disruptive by revolutionizing and displacing incumbent technologies. Results in major realignments of industry conditions and market relations. It can radically affect existing industry models based on its ability to offer innovative solutions for tackling existing issues, create entirely new market niches, and make previous solutions irrelevant. Sustaining innovations in the S-curve's upward movement refers to incremental advancements (gradual) made to a technology or product's performance, efficiency, or functionality to obtain market acceptance. It is not necessary that it is always incremental; it can be quite radical, too (Dalum, Pedersen, & Villumsen, 2022). These innovations are mostly incremental in nature and require new knowledge and technological evolution on the existing ones. Whereas established technologies are those that are in the mature stage in terms of the technological cycle. They are commonplace, fine-tuned, and well-incorporated in today's marketplace activities. Disruptive technology model from Clayton Christensen is a theory best used to discuss the impact of new and ground breaking technologies on a firms' existence. This model was introduced by Christensen in 1997 in his book "The Innovators Dilemma: When New Technologies Cause Great Firms to Fail." This model was a function of performance and time in relation to new technology. This model also

describes the inability of great firms to counter the impact of new technology. Christensen argues that due to the unpredictable nature of disruptive technology, successful and well managed firms can also be negatively affected. In his theory, Christensen distinguished between sustainable technologies and disruptive technologies in which sustainable technologies add value to existing and already established products whilst disruptive technologies disrupt or redefine performance levels thereby creating a new marketplace (Anthony, 2004).

In general, technological improvements result in performance improvement of established products. These products usually become faster, cheaper, louder, and smaller, as indicated by the above characteristics of disruptive technology (Christensen & Bower, 1996). These new innovations will be simpler and opportune to customers because they remain in line with their current needs and expectations. Christensen regards these kinds of developments as “sustaining in character”. Great firms direct the industry to embrace these innovations and exploit potential benefits of these technologies. As competition increases, firms attempt to upgrade their performance levels by producing better products in order to attain more customers in the market. The improvements in performance will however, increase at a faster rate than anticipated customer needs, a situation which will give rise to disruptive technologies (King & Baatartogtokh, 2015). In Christensen model, the x-axis represents time, the y-axis represents the product performance and the z-axis represents consumer segments. The two dimensions, time and performance define a particular product in a market. The third dimension or z-axis represents satisfied customers whose needs are being met by the increased uses of the products. The more the performance of a product increases, the more the needs of customers are being met and eventually customer’s expectations are surpassed.

This situation will leave a gap of unmet needs which requires simpler and convenient product offerings (Christensen & Raynor, 2013). This model is useful as it provides insights to business associates and managers on the impact of disruptive technologies and why many firms fail when confronted by such technologies.

Big Data Analytics

Without analyzing big data, which is the concept's primary source, big data analytics cannot be comprehended to its fullest potential. According to this literature, "big data" refers to vast quantities of real-time accessible organized and unstructured data. These types of data are present in nature, since there are data everywhere, but their complexity prevents them from being handled in the conventional ways (Mackenzie, 2016). Due to these benefits, big data has recently attracted interest from both academics and industry, who both see its great operational and strategic potential in creating company value. The value of big data in companies may be traced back to Laney (2001) early use of the 3Vs (volume, velocity, and variety). He contends that by comprehending the three Vs of their big data management, an organization may be more prepared to handle big data difficulties. In a 2001 Meta Group research report titled 3D Data Management: Controlling Data Volume, Variety, and Velocity, Gartner analyst Doug Laney presented the 3Vs idea. Big data can be defined as the approach to managing, processing, and analyzing five dimensions of data. These five dimensions are called the "principles of big data practices" (Ferraris, 2017). They are;

i. **Volume:** The amount of data generated every day increases dramatically as a result of technology's never-ending innovation. The quantity of data created on the internet per second exceeds the storage capacity of the whole internet twenty years ago. Enterprises are awash with ever-growing data of all types, easily amassing terabytes even petabytes of information (e.g. turning 12 terabytes of Tweets per day into improved product sentiment analysis; or converting 350 billion annual meter readings to better predict power consumption). Moreover, Demchenko, Grosso, de Laat and Membrey (2014) stated that volume is the most important and distinctive feature of Big Data, imposing specific requirements to all traditional technologies and tools currently used.

ii. **Variety:** Big data comes from a variety of very recent sources. In actuality, data are produced by several digital platforms. Consumers provide information about their habits, wants, and desires through their inputs on the

countless digital gadgets. Big data, for instance, might appear as messages, notifications, photographs shared on social media, sensor readings, GPS signals from mobile devices, and more.

iii. **Velocity:** Since the capacity to make judgements quickly is one of the essential elements for success in an increasingly competitive economic environment, the speed at which data is created is even more crucial than its amount. Data are now available in real time or almost real time, allowing businesses to make decisions much more quickly and with much greater agility. For example, the data on airline and hotel dynamic pricing and credit card terminal acceptance and refusal.

iv. Veracity: The original source's dependability must be at least substantially ensured, and high-quality information must be obtained. The risk that data might be incorrect, lacking, or out-of-date is referred to as veracity. This concept defines how much company executives should trust data and information when making decisions. Therefore, discovering the appropriate connections in big data is crucial for the future of the company. However, as the quantity and variety of sources increase, building confidence in big data is a significant difficulty since one in three corporate executives do not believe the information used to make choices.

v. Value: This principle is a later addition to the original 3V's introduced by Laney (2001), as it became apparent that data itself had a value. It alludes to a crucial aspect of the data, which is determined by the value that the data may offer to the desired procedure, activity, predictive analysis, or hypothesis (Brown, 2011). The events or processes that the data reflects, such as stochastic, probabilistic, regular, or random, will determine the value of the data. Depending on this, constraints may be placed on data collection, its storage (for a potential event of interest), etc. Data volume and diversity are directly connected to data value in this regard. Big data still has an untapped potential in terms of technology before it can live up to the promises that are currently being made for it.

Cloud Computing

It is quite hard to give a standardized precise description for the vast adoption of cloud computing. Indeed, at best the concept of cloud computing may be regarded as inaccurate and fluid as the borders of the circus clouds in the sky. In addition, its elements have no defined description of their responsibilities. Cloud Computing can utilize the Internet, which is hosted by a third-party source, for access of lies, data, programmes and services through a web browser and only pays for the computing services and resources you utilize. As the approach that enables user-friend like, comfortable, on-demand access to a shared pool of customization computing resources (e.g. networks, processors, space, apps and services), Cloud Computing may be provided quickly with minimum effort in management or contact between service providers. It can be ascribed either to its provenance from many various network architectures, or by the large services it delivers, to the difficulties in arriving at a clear cloud identity. Cloud Computing takes its principles from peer-to-peer design, autonomous computation, virtualization, and service-focused design into account. The origin of Cloud Computing as a new high performance computing concept is an expansion for cluster computing as a subset of grid computing technology. The server design that was launched in the 1980s was an outgrowth of Cloud Computing.

Ironically, the virtualization of cloud computing varies from the client – servers. Ebelugwu and Emereole (2026), digital transformation has enabled banks to streamline their processes, reduce operational costs, improve decision-making, and respond more effectively to the dynamic needs of customers in an increasingly competitive financial environment. Definitions encompass a variety of views and are presented at different levels of depth. Gartner's cloud definition refers to scalability, elasticity and service delivery. The definition for Forester refers to abstraction, scalability, hosting, and charging. In IDC, cloud computing has been associated with new IT models and discusses real time web provision. ACM communications distinguishes between private and public clouds and believes that clouds are software and hardware that are centralized in data. NIST

provides a thorough explanation of distinct types of computing resources, cloud computing features and accompanying modes of service and deployment. NIST: On-demand network access is a paradigm to allow easy access to a shared pool of customizable computing resources (e.g. networks, servers, storage, apps and services) that may be delivered quickly and with a minimum administrative effort or contact with cloud providers.

Theoretical Review

Diffusion of Innovation Theory by Gabriel Tarde (1903)

Sartipi (2020) states that the theory of diffusion of innovation (DOI) was initially introduced by French sociologist. Gabriel Tarde in 1903 and later popularized by Rogers (1962) as a means to elucidate the process of disseminating inventions. Rogers (1962) further popularized the diffusion of innovation theory to illustrate the impact of the rate of adoption of a new technology on a local economy. Diffusion occurs progressively within a market (a system of users) when information and opinions about a new technology are shared among potential users through various communication channels. In this way, users acquire personal knowledge about new technology (Rogers, 1995). Knowledge is the first step of Rogers' five stage process of adoption. The other four steps are: persuasion, decision (to adopt or to reject new technology), implementation and confirmation. Accepting this framework, non-adoption can be explained as the final outcome of an individual process of adoption that failed (Rogers, 2003). Rogers argues that a great number of conditions (e.g. personal limitations of the potential user) and/or external obstacles (e.g. ineffective communication channels) may inhibit the success of the adoption process.

According to this theory, the rate of diffusion is affected by an innovation's relative advantage, complexity, compatibility, trialability and observability. Rogers (1995) defines relative advantage as 'the degree to which an innovation is seen as being superior to its predecessor'. Complexity, which is comparable to technology acceptance model's (TAM) perceived ease of use construct, is 'the degree to which an innovation is seen by the potential adopter as being relatively difficult to use and understand'. Compatibility refers to 'the degree to which an innovation is seen to be compatible with existing values, beliefs, experiences and needs of adopters. Trialability is the 'degree to which an idea can be experimented on a limited basis'. Finally, observability is the 'degree to which the results of an innovation are visible' (Rogers, 1995). In an organizational context, when considering adoption and diffusion of technology, two concepts are significant: the radicalness of the innovation and its disruptiveness. Radicalness is generally regarded as the extent to which an innovation involves new technology that differs from what is existing, disruptiveness of innovations refers to the extent that a customer segment (not mainstream) values the innovation such that it disrupts mainstream markets. In terms of innovation, radicalness relates to a technology dimension: disruptiveness to a market dimension.

According to Rogers, the diffusion and adoption of new technologies will lead to an increasing return on investment until saturation is reached. The diffusion of innovation necessitates four variables: innovation, communication, social structure, and time. These variables aim to explain the manner, reasons, and speed at which new ideas and technologies proliferate. Rogers (1995) defines the diffusion of innovation as the process through which innovation is communicated among members of a social system over time and through specific channels.

Theory of Creative Destruction by Schumpeter (1939)

Schumpeter (1939) considered innovation as both the creator and destroyer of corporations and entire industries. He was among the earliest scholars to note the disruptive nature of technological change observing that it could lead to waves of "creative destruction. Schumpeter insisted on the role of entrepreneurs in seizing discontinuous opportunities to innovate. Innovations were taken in a broad sense of new 'combinations' of producers and means of production, which includes new products, new methods of production, opening up of new markets, utilization of new raw materials, or even the reorganization of a sector of the economy. In later years, Schumpeter (1942) placed greater emphasis on the role of larger enterprises in innovation, seeming to believe that as scientific knowledge accumulated there was a threshold investment in R & D below which a firm could not be an effective player. Schumpeter

argued that entrepreneurs, who could be independent inventors or Research and Development engineers in large corporations, created the opportunity for new profits with their innovations. In turn, groups of imitators attracted by super-profits would start a wave of investment that would erode the profit margin for the innovation. However, before the economy could equilibrate a new innovation or set of innovations, conceptualized by Schumpeter as Kondratiev cycles, would emerge to begin the business cycle over again.

Empirical Review

Abu-El-Haija, Mat, Mat Isa, and Abdullah, (2025), examined the effect of cloud computing on firm performance in the digital era: a scoping review. The increasing adoption of cloud computing across various industries signifies its pivotal role in the digital transformation of businesses. Considering diverse industry and geographical contexts, this study reviews the literature to understand the relationship between cloud computing adoption and firm performance. The scoping review integrates findings from multiple databases, focusing on studies published between January 2018 and 2023. It evaluates the impact of cloud computing on firm performance, considering technological, organizational, and environmental factors influencing its adoption. The review reveals that cloud computing positively impacts firm performance across various metrics. It highlights that technological readiness, management support, and competitive pressure are critical for cloud computing adoption. The evidence also suggests that cloud computing contributes to strategic benefits, operational efficiency, and compliance with regulatory standards. Cloud computing emerges as a strategic asset for firms, enhancing performance and offering competitive advantages in the digital era. Future research should address the rapid technological and regulatory evolutions and explore the integration of cloud computing with sustainability initiatives to provide comprehensive insights into its business implications. Managers are advised to adopt a proactive approach to leverage cloud computing effectively, aligning it with broader business objectives and sustainability goals.

Lefevre, (2025), evaluated the influence of AI-Integrated cloud computing services on individual and organizational performance metrics. Artificial Intelligence (AI)-integrated Cloud computing services are transforming how individuals and organizations operate by enhancing performance, collaboration, and access to digital resources. This research investigates the effects of these services on individual efficiency, skill development, and satisfaction, as well as on organizational processes, cost management, and data governance. Semi-structured interviews with professionals across diverse sectors provided insights into both practical benefits and challenges of implementation. Results indicate that AI-driven Cloud solutions improve task efficiency, facilitate interdepartmental and cross-organizational collaboration, and support the development of individual competencies. Organizations benefit from optimized workflows, reduced operational costs, and improved data security, while societal impacts include enhanced digital equity, resilience, and innovation potential through secure and efficient management of large-scale data. Despite these advantages, privacy concerns, environmental considerations, and organizational readiness remain significant factors that influence adoption outcomes.

The findings contribute to the understanding of AI-integrated Cloud computing adoption, highlighting the interplay between technology, human factors, and organizational practices. The study offers practical guidance for organizations and individuals seeking to leverage AI-driven Cloud services effectively while addressing associated risks, and extends theoretical perspectives on the adoption and performance implications of emerging information technologies. Al-Masouri, (2025), studied the Impact of Internet of Things Technology on Organizational Performance, Taking into Account the Role of Knowledge Creation Intermediaries (Case Study: Bank of Yemen and Kuwait. The study aimed to study the impact of the Internet of Things on organizational performance, taking into account its role in knowledge creation. The research method was applied in terms of purpose and the descriptive correlation approach. The banking statistical population includes the statistical population of the Bank of Yemen and Kuwait in the

capital, Sana'a, consisting of 1,050 individuals. The sample size of 284 individuals was selected using a simple random sampling method and measured using a questionnaire.

Regarding the results of this study, the questionnaire results were evaluated using Cronbach's alpha coefficient and the validity coefficient, and their reliability and validity were confirmed. The structural equation model data also indicated a good fit for the model. The results showed that the Bank of Yemen and Kuwait succeeded in increasing its performance through the use of the Internet of Things. Furthermore, knowledge creation has a positive and significant impact on the relationship between the Internet of Things and performance. Nugroho, Syahputra, Hanifa, Werleam, Herli, Budi, and Nugroho, (2024), analyzed of the use of IoT in attendance management and productivity monitoring on employee performance and operational efficiency in Central Java Manufacturing Industry. This study investigates the impact of Internet of Things (IoT) usage in attendance management and productivity monitoring on employee performance and operational efficiency in the manufacturing industry of Central Java. Using a quantitative approach, data were collected from 270 respondents and analyzed with Structural Equation Modeling-Partial Least Squares (SEM-PLS 3). The results indicate that IoT-driven systems in both attendance management and productivity monitoring have a significant positive effect on employee performance and operational efficiency. Specifically, IoT-enabled attendance management improves workforce accountability and discipline, while productivity monitoring enhances real-time feedback and workflow optimization. These findings highlight the critical role of IoT technology in transforming workforce and operational management in manufacturing, contributing to improved performance and efficiency. The study provides valuable insights for decision-makers in the manufacturing industry regarding the adoption of IoT technologies to enhance competitiveness and operational outcomes.

Gap in Literature

Previous empirical studies concentrated largely on specific technological practices such as e-recruitment, ICT adoption, Six Sigma manufacturing, and technological innovation on organizational performance in brewery firms in Nigeria. For instance, studies examined e-recruitment and organizational performance in brewery firms in South-West Nigeria, technological innovation in Nigeria Consolidated Breweries Plc, and Six Sigma manufacturing in South-South Nigeria. Most previous studies on technology and organizational performance in brewery firms were anchored on theories such as the Technology Acceptance Model (TAM), Theory of Constraints (TOC), SWOT model, and Critical Success Factors model. These theories mainly explain technology adoption, operational efficiency, or organizational adaptation but failed to adequately explain the disruptive nature of emerging digital technologies and their transformational effects on organizational performance. Most existing studies were conducted outside the South-South region of Nigeria. Some focused on South-West Nigeria, South-East Nigeria, Lagos State, Ogun State, or Nigeria generally without specifically addressing brewery firms operating in the South-South geopolitical zone. Several earlier studies focused on employees of manufacturing firms generally, selected staff of a single brewery company, or management personnel without concentrating on the broader population of brewery firms in South-South Nigeria. For example, some studies investigated only selected employees of Nigeria Consolidated Breweries Plc or selected firms in South-West Nigeria. The heavy reliance on quantitative cross-sectional designs limits the understanding of causal relationships and long-term technological transformation in brewery firms. Despite increasing attention on technology adoption in Nigerian organizations, there is still inadequate knowledge regarding the extent to which disruptive technologies influence organizational performance indicators such as productivity, profitability, operational efficiency, innovation capability, customer satisfaction, and competitive advantage in brewery firms. Existing studies focused more on conventional ICT systems, e-recruitment, supply chain collaboration, and technological innovation rather than emerging disruptive technologies and their strategic implications.

Hence, the present study seeks to bridge this gap by examining effect of cloud computing on expansion, assess the effect of internet of things on workflow optimization, examine the effect of

artificial intelligence on competitive advantage, ascertain the effect of big data analytics on product development, assess the effect of blockchain on customer satisfaction, determine the effect of real-time monitoring on branding and examine the effect of data-driven decision-making on customer feedback of brewery firms in South-South.

Methodology

This study adopted the survey research design. The study adopted primary data to gather information from the respondents. The population is nine hundred and eighty-nine (989). The sample size was three hundred and seventy-four (374). This study adopted the simple stratified sampling technique. The questionnaire was designed in a five (5) point Likert scale structure which consisted of closed-ended questions that was easier for the respondents to answer because of the fixed presentation of questions and responses. Each item required the respondent to indicate the frequency of his or her various opinions under Strongly Agree (SA) =5, Agree (A) =4, Undecided (UN) =3, Disagree (D) = 2 and Strongly Disagree (SD) =1. In test the hypotheses Pearson correlation coefficient was employed to test the relationship dependent and independent variables of the study.

Data Presentation And Analysis

Table 1: Return of questionnaire

Firms	Questionnaire Distributed	%	Questionnaire Retrieved	%	Questionnaire Lost	%
Champion Breweries Uyo	94	25.1	82	22.0	12	3.2
Nigeria Bottling Company Port Harcourt	138	36.9	110	29.4	28	7.5
International Breweries Plc, Port Harcourt	142	38.0	119	31.8	23	6.1
Total	**374**	**100**	**311**	**83.2**	**63**	**16.8**

Source; Field Survey, 2026

Table 1 revealed that a total of three hundred and seventy four (374) copies of the questionnaire were distributed to the selected breweries firms in South-South Nigeria. Out of this number, sixty-three (63) copies of questionnaire were lost/wrongly filled with percentage ratio of 16.8% while three hundred and eleven (311) copies of questionnaire were correctly filled and returned with percentage ratio of 83.2% and this formed the basis of the study.

Data Presentation

Table 2: Ascertain the effect of cloud computing on operational efficiency of brewery firms in South-South.

RESPONSES	SA 5	A 4	UN 3	D 2	SD 1	TOTAL	MEAN	Std. Dev.
Scalability of operations improve organizational reputation	75	183	37	4	12	1238	4.0	.872
Cost efficiency strengthens organizational competitive advantage	83	199	25	4	-	1294	4.2	.612
Market reach and accessibility boost organizational efficiency	108	175	26	2	-	1322	4.3	.628
Speed of business deployment positively impact on financial performance	120	173	14	4	-	1342	4.3	.620

Source: Field Survey, 2026

Table above showed the effect of cloud computing on operational efficiency of brewery firms in South-South. Majority of the respondents with the highest mean scores of 4.3, 4.3, 4.2 and 4.0 respectively strongly agreed that Scalability of operations improve organizational reputation. Cost efficiency strengthens organizational competitive advantage. Market reach and accessibility boost organizational efficiency and Speed of business deployment positively impact on financial performance.

Table 3: Assess the effect of internet of things on workflow optimization of brewery firms in South-South.N=311

RESPONSES	SA 5	A 4	UN 3	D 2	SD 1	TOTAL	MEAN	Std. Dev.
Real-Time process monitoring drives firms growth and sustainable process	102	164	37	3	5	1288	4.1	.782
Automation of routine tasks improves organizational performance	126	151	20	12	2	1320	4.2	.790
Improved resource utilization boost organizational strategic objectives	140	148	10	12	1	1347	4.3	.747
Reduced operational delays enhances organizational performance and firm value	124	171	12	4	-	1348	4.3	.615

Source: Field Survey, 2026

Table above showed effect of internet of things on workflow optimization of brewery firms in South-South. Majority of the respondents with the highest mean scores of 4.3, 4.3, 4.2 and 4.1 respectively strongly agreed that Real-Time process monitoring drives firms growth and sustainable process. Automation of routine tasks improves organizational performance. Improved resource utilization boost organizational strategic objectives. Reduced operational delays enhances organizational performance and firm value.

Test of Hypotheses

HO_1: There is no positive significant effect between cloud computing and operational efficiency of brewery firms in South-South

Table 4: Correlation Matrix between cloud computing and operational efficiency of brewery firms in South-South

`		Cloud Computing	Expansion
Cloud Computing	Pearson	1	.933
	Sig (2-tailed)		.000
	N	311	311
	R^2	(0.870) 87%	
Operational Efficiency	Pearson	.933	1
	Sig. (2-tailed)	.000	
	N	311	311

Source; Field Data, 2026

The data in table 4 reveals a correlation (r) of 0.933 which is positive with p-value = .000 < .05% significant level, which indicates a very high extent relationship. The coefficient of determination (R2) of 0.870 indicates that 87% of the cloud computing could be accounted for by the expansion. This implies that there is a positive significant effect between cloud computing and operational efficiency of brewery firms in South-South

HO_2: There is no positive significant effect between internet of things and workflow optimization of brewery firms in South-South

Table 5: Correlation Matrix between internet of things and workflow optimization of brewery firms in South-South

		Internet of Things	Workflow Optimization
Internet of Things	Pearson	1	.872
	Sig (2-tailed)		.005
	N	311	311
	R^2	(0.760)	
		76%	
Workflow	Pearson	.872	1
Optimization	Sig. (2-tailed)	.005	
	N	311	311

Source; Field Data, 2026

Data in Table 5 shows correlation (r) coefficient of 0.872 which is positive p-value = .005 < .05% significant level which indicates a very high extent relationship. This result indicates that internet of things to a very high extent, relates workflow optimization of brewery firms in South-South. The coefficient of determination (R2) of 0.760 indicates that 76% of internet of things could be accounted for by workflow optimization. This implies that there is a positive significant effect between internet of things and workflow optimization of brewery firms in South-South

Summary of Findings

The results from the analysis of the findings stated that

i. There is a positive significant effect between cloud computing and operational efficiency of brewery firms in south-south (p-value = .000 < .05% significant level). This implies that a unit increase in cloud computing leads to a unit increase in operational efficiency
ii. There is a positive significant effect between internet of things and workflow optimization of brewery firms in south-south (p-value = .005 < .05% significant level). This implies that a unit increase in internet of things leads to a unit increase in workflow optimization

Conclusion

The findings revealed that disruptive technologies have become critical drivers of operational efficiency, competitiveness, innovation, productivity, and profitability among brewery firms operating in an increasingly dynamic and technology-driven business environment. This study examined the effect of disruptive technologies on organizational performance of brewery firms in South-South, Nigeria, with emphasis on cloud computing, Internet of Things (IoT). The study established that cloud computing significantly enhanced organizational flexibility, information accessibility, collaboration, and cost efficiency through improved storage and processing capabilities. Internet of Things (IoT) adoption was found to improve workflow optimization, machine connectivity, inventory control, and operational coordination across brewery production processes.

Therefore, the study concluded that brewery firms that strategically invest in and integrate modern technological innovations into their operations are more likely to achieve sustainable growth, operational excellence, competitive advantage, customer satisfaction, and long-term survival in the contemporary business environment.

Recommendations

i. Brewery firms in South-South Nigeria should regularly invest more in cloud computing infrastructure to improve operational efficiency, data storage, communication, and accessibility

of organizational information across different departments and branches.

ii. Brewery firms should consistently install IoT-enabled sensors and smart devices in production lines to facilitate real-time monitoring of machines, inventory levels, temperature control, and equipment performance for improved workflow optimization.

References

Abu-El-Haija, R., Mat, N., Mat Isa, R., & Abdullah, N. A. (2025). Exploring the effect of cloud computing on firm performance in the digital era: A scoping review. *SAGE Open, 15*(3). https://doi.org/10.1177/21582440251357189

Al-Masouri, K. A. (2025). Studying the impact of Internet of Things technology on organizational performance, taking into account the role of knowledge creation intermediaries (Case study: Bank of Yemen and Kuwait). *Mağallat Al-'ulūm Wa-al-Tiknūlūğiyā, 30*(7), 1–11. https://doi.org/10.20428/jst.v30i6.2906

Bai, C., & Li, J. (2020). Digital transformation and industrial upgrading in manufacturing firms. *Technological Forecasting and Social Change, 155*, 119–130.

Brown, B. (2011). *Data value and analytics in business decision-making*. MIT Press.

Christensen, C. M., & Bower, J. L. (1996). Customer power, strategic investment, and the failure of leading firms. *Strategic Management Journal, 17*(3), 197–218.

Christensen, C. M., & Raynor, M. E. (2013). *The innovator's solution: Creating and sustaining successful growth*. Harvard Business Review Press.

Dalum, B., Pedersen, C. Ø. R., & Villumsen, G. (2022). Innovation trajectories and industrial dynamics: Revisiting technological paradigms. *Research Policy, 51*(2), 104431.

Demchenko, Y., Grosso, P., de Laat, C., & Membrey, P. (2014). Addressing big data issues in scientific data infrastructure. *IEEE International Conference on Collaboration Technologies and Systems*, 48–55.

Ebelugwu, I. E., & Emereole, I. D. (2026). Effect of Digital Transformation on Performance of Selected Deposit Money Banks in Abia State. *Keele University, Journal of Management & Organizational Policy*. MAIJMOP. 15, (2). 191-200

Frizzo-Barker, J. (2020). Blockchain as a disruptive technology: Adoption and innovation challenges. *Information Systems Frontiers, 22*(4), 1–15.

King, A. A., & Baatartogtokh, B. (2015). How useful is the theory of disruptive innovation? *MIT Sloan Management Review, 57*(1), 77–90.

Laney, D. (2001). 3D data management: Controlling data volume, velocity, and variety. *META Group Research Report*.

Lefevre, V. (2025). Evaluating the influence of AI-integrated cloud computing services on individual and organizational performance metrics. *Journal of Digitovation and Information System*. https://doi.org/10.54433/jdiis.2024100055

Leipziger, D., & Dodev, Y. (2016). Technology, employment, and skills transformation in developing economies. *World Development Perspectives, 3*, 1–9.

Mackenzie, A. (2016). Big data and data complexity in digital environments. *Information, Communication & Society, 19*(1), 1–15.

Mariani, M., & Fosso Wamba, S. (2020). Big data analytics and digital transformation in manufacturing. *Industrial Marketing Management, 90*, 1–12.

Nugroho, B. S., Syahputra, M., Hanifa, A., Werleam, I., Herli, C., Budi, N., & Nugroho, S. (2024). Analysis of the use of IoT in attendance management and productivity monitoring on employee performance and operational efficiency in Central Java manufacturing industry. https://doi.org/10.58812/wsshs.v2i10.1359

Rogers, E. M. (1995). *Diffusion of innovations* (4th ed.). Free Press.

Schumpeter, J. A. (1942). *Capitalism, socialism and democracy*. Harper & Brothers.

Wamba, S. F., & Mishra, D. (2017). Big data analytics and organizational performance. *Journal of Business Research, 70*, 1–9.