

Human Resource Analytics and Organizational Innovativeness of Indigenous Downstream Oil and Gas Firms in Rivers State, Nigeria

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<https://doi.org/10.56201/ijebm.vol.12.no9.2026.pg188.202>

Abstract

This study examined the relationship between human resource analytics and organizational innovativeness in indigenous downstream oil and gas firms in Rivers state, Nigeria. Specifically, it examined the relationship between the dimensions of HR analytics; and the measures of organizational innovativeness. The study adopted a cross sectional research design and thirty-six respondents drawn from twelve indigenous oil and gas firms constitute the population. Due to the size of the population, a census sampling technique was used because the population was small. Respondents were made up of marketing managers, HR managers and operations managers. Data was collected using a structured designed questionnaire. A total of thirty-six questionnaire were administered to the twelve selected oil and gas firms, three each. Out of the thirty-six, twenty-eight representing 78% were returned. However, only twenty met our standard and was used for data analysis. The results of the hypotheses tests showed that, there is a positive and strong relationship between human resource analytics and organizational innovativeness in indigenous downstream oil and gas firms in Rivers State. This explains that, HR analytics enables organizations to identify the root causes of performance gaps, improve decision-making and enhance product development, processes and supports organizations in forecasting customer needs, anticipating market trends, and proactively improving service delivery. It concluded that leveraging HR analytics, organizational innovativeness could be enhanced. The study, therefore, recommend that, firms should establish continuous training and capacity-building programmes in human resource analytics to improve employees' analytical competencies and encourage evidence-based decision-making that supports both product and service innovation.

Keywords: HR Analytics, Organizational Innovativeness, Product Innovative, Service Innovativeness and Predictive Analytics

Introduction

The advancement in technology we witnessed globally are products of human ingenuity and creativity. Apart from the cardinal physical objects God Himself created at creation, every other object and technology are products of human innovation. It suffices to say that, people are the fulcrum of technological advancement in the 21st century and any other time in human history. The organization we know and perceive as thriving globally and locally are built by people. People remains the most crucial asset any organization can possess (Daft, 2001). The summation of people new ideas, creativity to enhance performance and quality products and service delivery is term as innovativeness. Crossan and Apaydin (2010) define organizational innovativeness as an organization's overall capability to consistently develop and implement new products, services, processes, administrative systems, and business models that enhance organizational competitiveness. It encompasses technological innovation, administrative innovation, product innovation, process innovation, and strategic innovation.

Innovative organizations encourage creativity, knowledge sharing, experimentation, collaboration, and continuous learning among employees. Damanpour (1991) organizational innovativeness may be defined as the degree to which an individual is relatively earlier in adopting an innovation than other members of his system. Innovation and creativity are the new oil that grease the wheel of organizational survival, success and excellence. It reflects an organization's capacity to generate, adopt, and implement new ideas, processes, products, services, and management practices that enhance organizational effectiveness (Wang & Ahmed, 2004). Organizations with high levels of innovativeness are better positioned to respond to environmental changes, exploit emerging opportunities, improve operational efficiency and create superior customer value. Organizations are increasingly utilizing Human Resource Analytics (HRA) to improve workforce decision-making and stimulate organizational innovativeness (Damanpour 2014; Levenson 2018). Margherita (2022) argued that, to have a competitive edge in this age of advance technology, employees should be treated as delicate resource and thus align human resource function to the core business goals to enable organizations achieve success in the competitive market. Human resource are always at the very core of the organization's success. HR analytics plays a very important role in aligning the HR strategy with the overall business strategy and goal.

Human resource analytics combines manual and technology driven processes to enhance HR functions for effectiveness and efficiency (Oladipupo & Olubusayo, 2020; Mohammed, 2019). According to Marler and Boudreau (2017), Human Resource Analytics as a branch of Business Analytics and Business intelligence can be described as a practice in Human Resources aided by information technology which utilises visual, statistical and descriptive analyses of data linked to organisational performance, human capital, external economic benchmarks and HR processes to helping in making effective decision-making. The emergence of digital technologies has transformed the traditional role of human resource management from an administrative function into a strategic business partner. Human Resource Analytics enables organizations to understand employee behaviour, predict workforce trends, identify performance drivers, and optimize talent management strategies. By providing managers with reliable workforce intelligence, HRA facilitates informed decision-making, improves employee productivity, strengthens organizational learning, and promotes innovation (Angrave et al., 2016). Tessema et al., (2025) opined that, Human Resource Analytics (HRA), using advanced business intelligence and integrated reporting tools, provides insights that optimize decision-making and strategy alignment. The Nigeria indigenous downstream sector urgently require an improved way of managing employees to enable creativity and efficiency in order to optimize the potentials in the sector.

In developed countries, numerous empirical studies have established positive relationships between Human Resource Analytics and organizational outcomes such as employee performance, strategic decision-making, innovation, productivity, and organizational effectiveness (Marler & Boudreau, 2017; Angrave et al., 2016). Human Resource Analytics has gained increasing scholarly attention globally, however, there remains a significant empirical and contextual gap concerning its influence on organizational innovativeness among indigenous downstream oil and gas firms in Rivers State, Nigeria. In Nigeria, available studies largely focus on conventional human resource practices, employee performance, organizational commitment, and productivity while paying or no attention to Human Resource Analytics as a strategic driver of organizational innovation.

Statement of the problem

Innovativeness seems to be far from being expressed in our Indigenous downstream oil and gas firms in Rivers State because the employees may not be effectively managed leveraging on technology. Traditional HR functions still dominate and herald the operation of indigenous downstream oil and gas firms till date. However, these firms operate in a business environment characterized by sudden deregulation, fluctuating petroleum prices, technological disruption, infrastructure limitations, operational inefficiencies and increasing competition. These challenges require firms to develop innovative approaches that improve operational efficiency, supply chain management and overall organizational competitiveness. Although innovation is widely recognized as a critical driver of organizational success, survival and excellence, many indigenous downstream firms still rely heavily on traditional human resource management practices characterized by subjective decision-making, manual record keeping and lack of business intelligence, HR analytics and inadequate utilization of employees. While oil and gas firms in the developed countries have adopted technology to improve their HR functions by relying on data-driven and evidence-based human resource management, oil and gas firms in Rivers state are still many indigenous downstream firms still rely on traditional human resource practices based largely on managerial intuition rather than data-driven decision-making. Consequently, valuable workforce information that could improve recruitment, employee development, performance management, talent retention, and innovation is often underutilized (Angrave et al., 2016). As the industry becomes increasingly digitalized and competitive, organizations are expected to develop innovative capabilities that enable them to improve service delivery, operational efficiency, customer satisfaction, and sustainable competitive advantage.

Most studies on HR analytics and organizational performance are conducted overseas (Khan, et al., 2025; Tessema et al., 2025, Dahlbom et al., 2020 & Angrave et al., 2016). While some of those studies are crucial, the peculiar challenges in our downstream oil and gas environment make it difficult to apply most of their recommendations. This study seeks to examine the relationship between human resource analytics and organizational innovativeness in indigenous downstream oil and gas firms in Rivers state, Nigeria.

Conceptual Framework

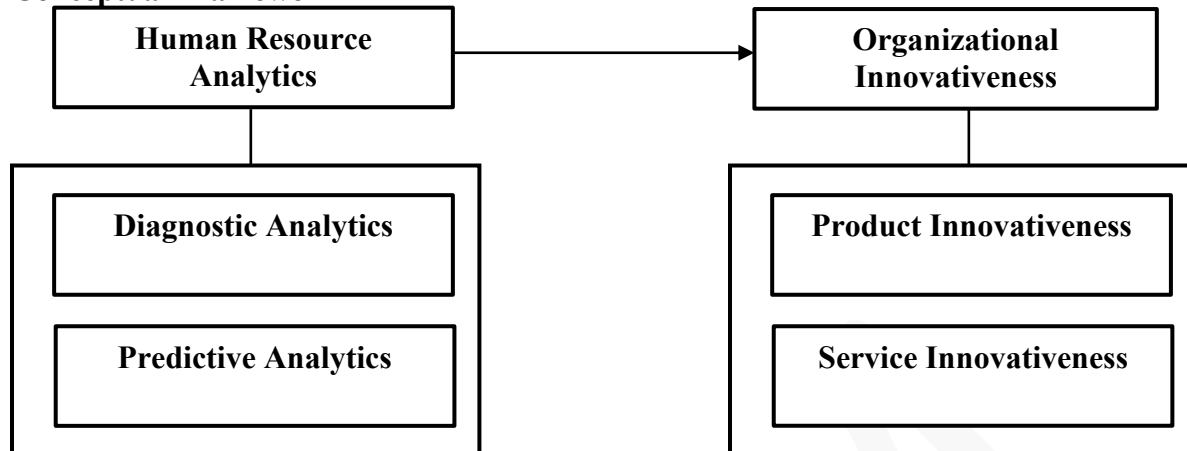


Fig. 1:1: Conceptual framework of human resource analytics and organizational innovativeness of indigenous downstream oil and gas firms in Rivers state, Nigeria

Source: (Damanpour 19991; Oladipupo & Olubusayo, 2020)

Aim and Objectives of the Study

The aim of the study was to examine the relationship between Human Resource Analytics and Organizational innovativeness of indigenous Downstream Oil and Gas firms in firms in Rivers state, Nigeria. The specific objectives are to:

1. Investigate the relationship between diagnostic analytics and product innovativeness of indigenous downstream oil and gas firms in Rivers State.
2. Examine the relationship between predictive analytics and service innovativeness of indigenous downstream oil and gas firms in Rivers State

Research Questions

The following research questions directed and guided the study:

1. What is the relationship between diagnostic analytics and product innovativeness of indigenous downstream oil and gas firms in Rivers State?
2. What is the relationship between predictive analytics and service innovativeness of indigenous downstream oil and gas firms in Rivers State?

Research Hypotheses

The following research hypotheses were formulated and tested in the study:

H₀₁: There is no relationship between diagnostic analytics and product innovativeness of indigenous downstream oil and gas firms in Rivers State

H₀₂: There is no relationship between predictive analytics and service innovativeness of indigenous downstream oil and gas firms in Rivers State

Review of Related Literature

Human Resource Analytics

Human Resource analytics is also referred to as workforce science, workforce analytics, talent analytics, people analytic, human capital analytics, talents decision science, talent architecture, Human capital metrics and strategy, HR architecture and metrics (Levenson. 2018). According to Marler and Boudreau (2017), Human resource analytics is an offshoot of business analytics and

business intelligence which can be described as a practice in human resource aided by information technology that utilizes visual, statistical and descriptive data on employees and potential employees to help in making effective HR decisions. Tessema et al., (2025) argued that, human resource Analytics has evolved from HR scorecards due to the advancement in technology and the inefficiency attributable to HR scorecard and some HR performance appraisal tools. According to Mohammed (2019), the idea of applying scorecards within the context of HR was inspired by Kaplan and Norton's Balanced Scorecard, a concept developed in 1996 for measurement of performance (Kaplan & Norton, 1996). But these scorecards over time proved ineffective and unable to achieve intended results hence the need for a more scientific and evidence-based approach to HRM (Boudreau & Ramstad, 2007; Pfeffer & Sutton, 2006; Rynes et al., 2007). Heuvel and Bondarouk (2017) defined HR analytics as the systematic identification and qualification of people's drivers of business outcome. HR Analytics is the process of collecting, processing, transforming and managing HR related data to improve HR functions and activities for the overall benefit of the organization (Kapoor & Sherif, 2012). Tessema et al., (2025) opined that, Human resource analytics is an emerging discipline that incorporates data science into human resource management, reflecting the broader trend of utilizing data-driven methods for decision-making to improve HR effectiveness. Marler and Boudreau (2017) describe human resource analytics as a practice within human resources that utilizes information technology to analyze data through descriptive, visual, and statistical methods. Drawing from the above, HR analytics simply entails the adoption and utilization of technology to collect and analyse employee data to enhance evidence-based HR management. In this study, we operationalized HR analytics into diagnostics analytics and predictive analytics.

Dimensions of Human Resource Analytics

Diagnostic Analytics

Rasmussen and Ulrich (2015) stated that the main characteristics of diagnostic analytics are; enablement of the discovery of unpredictable relationships between historical and current patterns, explain effect relation, causes and correlation and dashboards on data discovery which focuses on visualizing complex dimensions, measures and relationships simultaneously. This aspect of HR analytics takes into account past records, historic data and examine the correlation and cause-effect. By analysing historical data, organizations can gain insights into workforce trends and patterns, identify areas for improvement, and make data-driven decisions about their workforce and align with overall organizational goal and business strategy (Khan et al., 2025). Diagnostic analytics utilizes software include but not limited to the following; SPSS, Microsoft Excel, SAP, IBM, Oracle, Orgvue solutions, Aquire solutions org publisher, Python, Visier, Power Bi, etc to analyze data.

Predictive Analytics

Predictive analytics concerns with future happenings and forecasting on HR functions. It utilizes data from diagnostic outcomes to predict the future in terms of skill gap, knowledge deficiency, behavioural inconsistency and people drawback. Khan et al., (2025) predictive analytics, future events and their effects are predicted using analytical tests, advanced algorithms, and machine learning. According to Fitz-enz (2009), the current pattern of data prediction and generation of certain meaning to the data for the future is a function of predictive analytics which uses diagnostic and descriptive analytics outcomes. Predictive analytics uses huge data and advance statistical tools to forecast the future behavior of employees, skill gaps, performance and motivation (Ranjan

& Basak, 2013). Rasmussen and Ulrich (2015) explained that, predictive analytics will help the HR managers in Forecasting attrition rates, probability of employee success on job from recruitment/selection process to motivation and job performance of employees.

Organizational Innovativeness

According to Fubara (2019), the word innovativeness is derived from the Latin word ‘innovare’ which means to make something new in a complex construct. Innovativeness literature has emanated from different fields of knowledge including management, psychology, economics, sociology and science. Within these and other disciplines, researchers tend to conceptualized innovativeness in different ways (Gopalakrishnan & Demanpour 1997; Tang 1998). Mcfadzean and Shaw (2005) defined innovativeness as a process that provides added value and novelty to the organization through the development of new procedures, solution and product. The process between input and output is most importantly a core attraction to organizational innovative endeavors. Organizational innovativeness refers to the managerial process of encouraging new ideas, processes, systems and adapting to new of excellence performance. The essence of innovativeness is to adopt something new, fresh, improve an existing pattern and version to improve performance and employee wellness (Fubara, 2020; Offor, 2023). According to Damanpour (1991), organizational innovativeness is operationalized into product and service innovativeness.

Measures of Organizational Innovativeness

Product Innovativeness

Product refers to tangible and physical good that meet customers or consumer’s need. It satisfy his/her immediate need at a price. Kotler (2013) define a product as anything that can be offered to a market for attention, acquisition, use or consumption that might satisfy a want or need. Product has different varieties that could satisfy consumers. These varieties according to Kotler (2013), are consumer products, convenient products, shopping products and specialty products. Product innovativeness is the creation of new product or an improvement of an existing product aim at meeting the needs of customers. Product innovativeness it also entails production of quality goods or products (the outputs of the organization), that satisfy the needs of customers. These products or goods could be physical goods or services that satisfy consumers’ need.

Service Innovativeness

According to Gallouj and Savona (2009), service innovativeness encompasses changes in sedelivery methods, service content, and interactions between service providers and recipients. Service refers to the intangible and unseen offering that enhance performance and production. In indigenous downstream oil and gas firms in Rivers State, effective utilization of HR Analytics has become increasingly important due to the highly technical nature of operations and the need to attract, retain, and develop competent employees. Rivers State remains the hub of Nigeria's oil and gas industry, hosting numerous indigenous petroleum marketing companies, distribution firms, logistics providers, and energy service organizations. Service has become a shining light in the oil and gas industry and there need for improve service delivery in the supply chain network.

Theoretical Review

Dynamic Capability Theory

Dynamic Capability Theory was developed by Teece et al., (1997) to explain how organizations achieve and sustain competitive advantage in rapidly changing business environments. The theory argues that beyond possessing valuable resources such as skills, experiences, new ideas, information, technology, money and goodwill, organizations must develop the ability to integrate, build, and reconfigure internal and external competencies to respond effectively to environmental changes (Teece et al., 1997). Dynamic capabilities encompass the processes through which firms sense opportunities and threats, seize emerging opportunities and transform their resource base to maintain competitiveness (Teece, 2007). The theory is particularly relevant in industries characterized by technological advancement, market volatility, regulatory changes, and intense competition, such as the downstream oil and gas sector. Indigenous downstream oil and gas firms in Rivers State operate in a dynamic environment where innovation, operational efficiency, and workforce adaptability are essential for long-term sustainability. Consequently, firms must continuously develop capabilities that enable them to respond proactively to industry changes while fostering innovation.

The relevance of Dynamic Capability Theory to this study lies in its explanation of how Human Resource Analytics contributes to organizational innovativeness among indigenous downstream oil and gas firms in Rivers State. The theory suggests that organizations capable of effectively analyzing workforce information and transforming insights into strategic actions are better positioned to develop innovative products, improve operational processes, encourage creative problem-solving, and sustain competitive advantage. Thus, Human Resource Analytics serves as a dynamic organizational capability that enables firms to continuously renew their human resource and innovation capabilities in response to environmental changes. Therefore, Dynamic Capability Theory provides a strong theoretical foundation for examining the relationship between Human Resource Analytics and organizational innovativeness in indigenous downstream oil and gas firms in Rivers State.

Empirical Review

Studies have concluded that HR Analytics benefits organizational results. As Huang et al. (2023) discovered that organizations implementing the HRA see improved employee performance. Research by Cho et al., (2023) demonstrates that adopting HR Analytics leads to stronger talent attraction, better workforce planning, and more highly engaged employees. These results suggest that HR Analytics is a crucial ally in the journey to organizational success by supporting evidence-based HR management (Khan et al., 2025). Below are selected empirical studies reviewed for this study: Tessema et al., (2025) carried out a study on the Effect of Human Resource Analytics on Organizational Performance: Insights from Ethiopia. Strategic human resource management plays a crucial role in fostering long-term Organizational performance through data-driven decision-making. Human Resource Analytics (HRA), using advanced business intelligence and integrated reporting tools, provides insights that optimize decision-making and strategy alignment. Despite its potential, the impact of HRA on organizational performance remains insufficiently explored. This study addresses this gap by examining the effects of HRA on organizational performance in Ethiopian organizations. A quantitative research design was employed, utilizing a survey method to collect data from 269 valid responses across 55 organizations in Addis Ababa, Ethiopia.

Structural Equation Modeling (SEM) via SmartPLS 3.0 software was used for data analysis. The Findings reveal that HRA significantly enhances organizational performance, with this

relationship mediated by strategic alignment between HR and organizational goals. Additionally, firm size was found to moderate the impact of HRA on performance, with larger firms deriving greater benefits. These results suggest that HRA serves as a powerful driver of enhanced organizational performance, with larger firms potentially reaping even greater benefits from its implementation. These results also underscore the importance of strategic alignment in leveraging HRA for improved performance, particularly in the context of Ethiopian organizations, where HRA adoption is still evolving. This study offers practical implications for organizations seeking to enhance workforce management and performance through data-driven HR strategies.

Khan et al., (2025) carried out a study on Impact of Human Resource Analytics and Innovation on Organizational Performance. This study aims to analyse the impact of HR Analytics and innovation on organisational performance. The implementation of HR analytics shows increasing growth but many organisations fail to reach their full capabilities because of difficulties with data quality along with technical obstacles combined with organizational resistance features. The findings of this study demonstrate that HR Analytics and innovation significant impact on organisational performance in Pakistan. Through HR Analytics, organizations increase their ability to estimate workforce needs while making data-oriented decisions that depend on human capital alongside business objectives. Mature implementation of HR analytics by organizations produces enhanced productivity together with innovative outputs which results in better performance in competition. HR analytics requires integrated data and employee training as well as ethical rules for data usage to produce optimal results. The research suggests organizations should develop data-driven practices combined with analytical competency development and resolution of privacy risks in human resources information Offor (2023) carried out a study predictive analytics and organizational innovativeness of downstream oil and gas firms in South-South, Nigeria. This paper examined the relationship between predictive analytics and organizational innovativeness particularly predictive analytics and measures of organizational innovativeness. The paper adopted a cross sectional research design. The population of the study comprises sixty (60) managers selected from twenty downstream oil and gas firms and census sampling method was adopted due the small size of the population. Sixty questionnaires were administered but fifty-seven were returned representing 95% of the total questionnaire. Three questionnaires were not returned representing 5% of the total questionnaire distributed. Out of the fifty-seven that were returned, fifty-four (54) of the questionnaires representing 90% were properly filled and acceptable for analysis while three copies of the questionnaire were rejected for failure to meet acceptable standard in order to minimize errors in the analysis hence a total of six (6) questionnaire representing 10% were not included in the analysis. Tables, percentages, Spearman's Rank Order Correlation Coefficients and Statistical Package for Social Science version 21 were used for data presentation, analysis and testing of hypotheses to determine the relationship between predictive analytics and organizational innovativeness of downstream oil and gas firms in South-South, Nigeria. The study discovered that there is positive and significant relationship between predictive analytics and organizational innovativeness of downstream oil and gas firms in South-South, Nigeria. Employees have emotions, feelings and desire which sometimes influence their actions, attitudes and responses in the organization. Predictive analytics helps HR managers in forecasting attrition rates, probability of employee success on job from recruitment, selection and performance process to motivation and job performance review of employees. The study therefore recommended that Employee data should be effective management and forecast carry out periodically to ascertain employee commitment, behavior and aspiration in line with their skills and contribution to the overall goals of the organization.

Methodology

This study examined the relationship between human resource analytics and organizational innovativeness of indigenous oil and gas firms in Rivers state, Nigeria. The study essentially determine relationship between HR analytics and the measures of organizational innovativeness (product innovativeness and service innovativeness). The study adopted a cross sectional research design and thirty-six (36) respondents drawn from twelve indigenous oil and gas firms constitute the population. Due to the size of the population, a census sampling technique was used because the population was small. Respondents were made up of marketing managers, HR managers and operations managers. Data was collected using a structured designed questionnaire. The structured design questionnaire was validated by experts and its reliability was confirmed through a retest procedure yielding a coefficient of 0.77, which indicated acceptable consistency. A total of thirty-six (36) questionnaire were administered to the twelve (12) selected oil and gas firms, three each. Out of the thirty-six, twenty eight (28) representing 78% were returned. However only twenty (20) meet our standard and was used for data analysis. We used tables, percentages, Spearman's Rank Order Correlation Coefficients with the aid of Statistical Package for Social Science (SPSS version 23) for data presentation, analysis and hypotheses testing to examine the relationship between human resource analytics and organizational innovativeness of indigenous oil and gas firms in Rivers state, Nigeria.

Table 1.1: Population of the study

S/N	Name of Firm	Address	Population
1	RAIN OIL NIG LTD	East-West Road, Port Harcourt	3
2	CHIBECO OIL AND GAS	East-West Road, Port Harcourt	3
3	ROYAL DYNASTY OIL	Ada-George Road, Port Harcourt	3
4	A.Y. SHAFI NIG. LTD	East-West Road, Port Harcourt	3
5	HERITAGE OIL NIG LIMITED	Rumuolumeni, Port Harcourt	3
6	JORAZ OIL NIG LIMITED	NTA-Choba Road, Port Harcourt	3
7	A.A RANO NIG. LTD	Rumuolumeni, Port Harcourt	3
8	BOBBY OIL NIG LIMITED	NTA-Choba Road, Port Harcourt	3
9	ENERGYMATICS NIG LTD	Olu-Obasanjo, Port Harcourt	3
10	OLA BANKY ENERGY LIMITED	East-West Road, Port Harcourt	3
11	SOBAZ OIL AND GAS LIMITED	Aba-Port Harcourt Expressway	3
12	HYDROPET NIG LIMITED	Rumuolumeni, Port Harcourt	3
	TOTAL		36

Source: (NDSPC, 2026)

Table 1.2 Administration of questionnaire

Name of Firms		Frequenc y	Percent	Valid Percent	Cumulative Percent
Valid	Rain Oil Nig Ltd	2	4.0	10.0	10.0
	Chibeco Oil & Gas	2	4.0	10.0	20.0
	Royal Dynasty Oil	2	4.0	10.0	30.0
	A. Y. Shafa Nig Ltd	2	4.0	10.0	40.0
	Heritage Oil Nig Ltd	1	2.0	5.0	45.0
	Joraz Oil Nig Ltd	1	2.0	5.0	50.0
	A. A. Rano	1	2.0	5.0	55.0
	Bobby Oil Nig Ltd	2	4.0	10.0	65.0
	Energymatics Nig Ltd	2	4.0	10.0	75.0
	Ola Banky Energy Ltd	1	2.0	5.0	80.0
	Sobaz Oil & Gas Ltd	2	4.0	10.0	90.0
	Hydropet Nig Ltd	2	4.0	10.0	100.0
Total		20	100.0	100.0	

Source: (NDSPC, 2026)

Table 1.2 above showed the list of selected twelve oil and gas firms in Rivers state, Nigeria for the study. Rivers state is unarguably a hub for oil and gas activities with several oil and gas firms operating at upstream, midstream and downstream sectors of the energy industry but these firms were selected based on their operational spread (different branches across Rivers state) in the downstream sector and accessibility

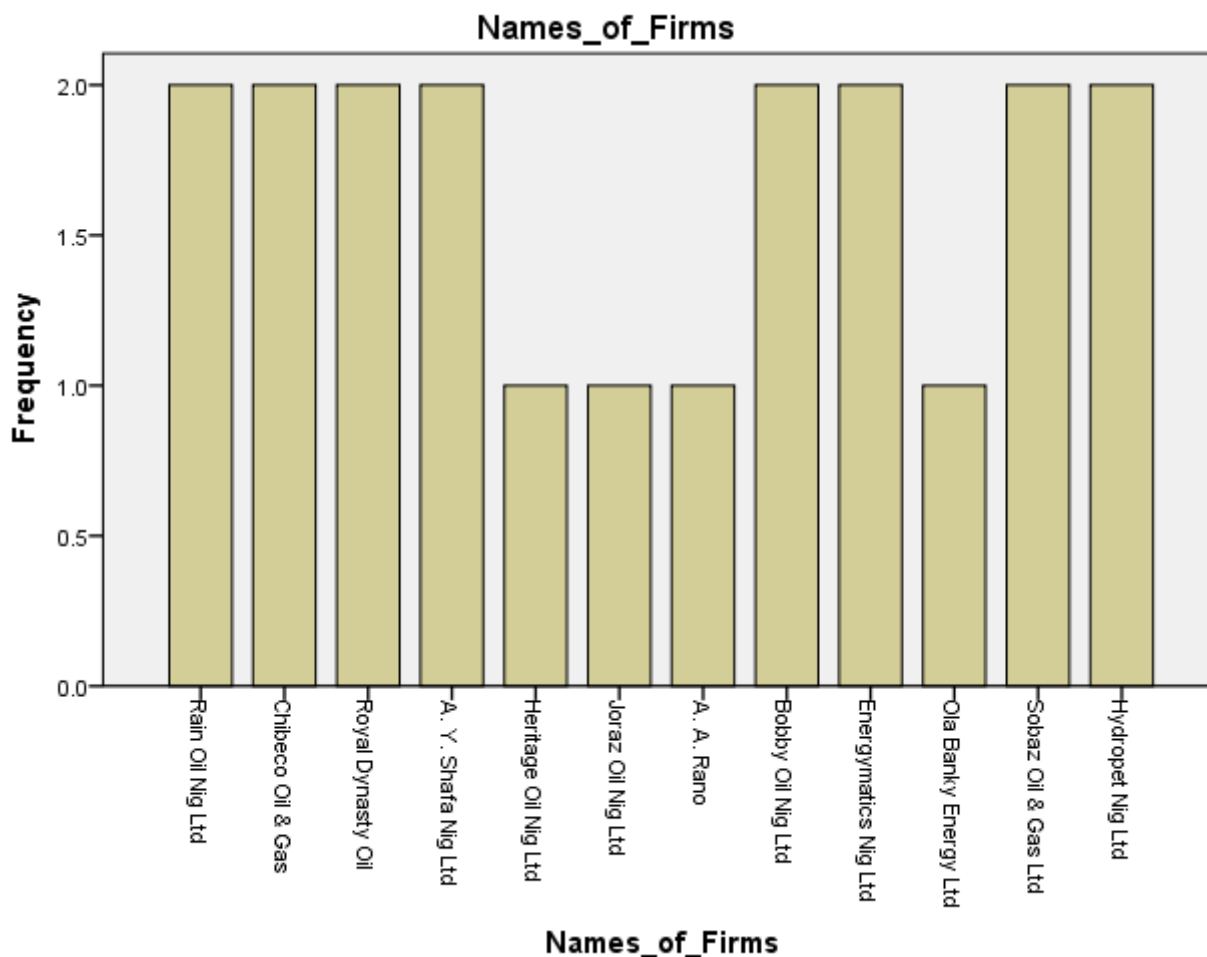


Fig. 1.2: List of selected indigenous downstream oil and gas firms in Rivers state, Nigeria

Data Analysis and Results

Bivariate Analysis

This study adopted spearman rank order correlation coefficient tool at 95% confident level for data analysis and at 5% significance level. The study tests hypotheses **H₀₁** and **H₀₂** which are bivariate and all stated in the null form.

Table 1.3 The Relationship between Diagnostic Analytics and Product Innovativeness

Spearman's rho	Diagnostic Analytics	Correlation Coefficient Sig. (2-tailed)	Diagnostic Analytics	Product Innovativeness
			1.000	.663**
		N	20	20
	Product Innovativeness	Correlation Coefficient	.663**	1.000

Sig. (2-tailed)	.000	.
N	20	20

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

Source: (Research Data, 2026)

H₀₁: There is no relationship between diagnostic analytics and product innovativeness of indigenous downstream oil and gas firms in Rivers state, Nigeria

The table 1.3 above showed the correlation co-efficient (rho) between diagnostic analytics and product innovativeness of indigenous downstream oil and gas firm which yielded ($r = 0.663$) and statistically indicated at ($p = 0.01 < 0.05$). This result indicates that, there is a positive relationship between the variables. In reality and practice, based on the empirical findings the null hypothesis earlier stated, is hereby rejected and the alternate hypothesis stated as, there is a positive relationship between diagnostic analytics and product innovativeness of indigenous downstream oil and gas firms in Rivers state is accepted

Table 1.4 The Relationship between Predictive Analytics and Service Innovativeness

	Predictive Analytics	Service Innovativeness
Spearman's rho		
Predictive Analytics	Correlation Coefficient Sig. (2-tailed) N	1.000 . 20
Service Innovativeness	Correlation Coefficient Sig. (2-tailed) N	.703** .000 20

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

Source: (Research Data, 2026)

The table above showed the correlation co-efficient (rho) between predictive analytics and service innovativeness of indigenous downstream oil and gas firm which yielded ($r = 0.703$) and statistically indicated at ($p = 0.01 < 0.05$). This result indicates that, there is a positive relationship between the variables. In reality and practice, based on the empirical findings the null hypothesis earlier stated, is hereby rejected and the alternate hypothesis stated as, there is a positive relationship between predictive analytics and service innovativeness of indigenous downstream oil and gas firms in Rivers state is accepted

Discussion of Findings

Drawing from the analysis of the study variables above, the study showed that there is a positive relationship between human resource analytics and organizational innovativeness in indigenous oil and gas firms in Rivers state, Nigeria using Spearman's order correlation co-efficient and at 95% confident interval. The results of the hypotheses tests for 1 and 2 on tables 1.3-1.4 shows a correlation co-efficient of 0.663 and 0.703 respectively

Diagnostic Analytics and Product Innovativeness

The result of the first hypothesis revealed a strong and high between diagnostics analytics and product innovativeness of indigenous downstream oil and gas firms in Rivers state, Nigeria ($r = 0.663$, $p < 0.01$). The correlation coefficient ($r = 0.663$) indicates a strong positive relationship between diagnostic analytics and product innovativeness among indigenous downstream oil and gas firms in Rivers State, suggesting that firms that effectively analyze past operational performance are more likely to develop innovative products. Diagnostic analytics enables organizations to identify the root causes of performance gaps, improve decision-making, and enhance product development processes, thereby fostering innovation (Hair et al., 2022). This finding is consistent with Tessema et al., (2025) and Barney (1991) which posits that data-driven analytical capabilities constitute valuable organizational resources that support sustainable innovation and competitive advantage

Predictive Analytics and Service Innovativeness

The result of the second hypothesis revealed a strong and high between predictive analytics and service innovativeness of indigenous downstream oil and gas firms in Rivers state, Nigeria ($r = 0.703$, $p < 0.01$). The correlation coefficient ($r = 0.703$) reveals a strong positive relationship between predictive analytics and service innovativeness, indicating that increased use of predictive analytics is associated with higher levels of service innovation among indigenous downstream oil and gas firms in Rivers State. Predictive analytics supports organizations in forecasting customer needs, anticipating market trends, and proactively improving service delivery, thereby enhancing organizational innovativeness (Davenport & Harris, 2017). This finding aligns with the dynamic capability's perspective, which emphasizes that organizations capable of anticipating environmental changes through analytical capabilities are better positioned to introduce innovative services and sustain competitive performance (Teece, 2018).

Conclusion and Recommendations

Organizations are progressively adopting data-driven decision-making to address HR challenges, facilitated by advancements in HR technologies. These innovations have transformed HR management, enabling organizations to make informed, evidence-based decisions that align HR activities with their overall business strategy (Dahlbom et al., 2020) to promote innovation and excellence in the workplace. In view of the findings, the under listed recommendations are made:

- i. Indigenous downstream oil and gas firms should strengthen the adoption of diagnostic analytics by implementing robust human resource and operational data analysis systems that identify performance gaps and support continuous product innovation.
- ii. Management should invest in predictive analytics technologies and employee analytical capabilities to anticipate customer needs, market trends, and operational challenges, thereby enhancing service innovativeness and organizational competitiveness.
- iii. Firms should establish continuous training and capacity-building programmes in human resource analytics to improve employees' analytical competencies and encourage evidence-based decision-making that supports both product and service innovation.

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