

**FORECASTING MANPOWER DEMAND AND ORGANIZATIONAL PERFORMANCE OF
SELECTED OIL AND GAS FIRMS IN PORT HARCOURT, RIVERS STATE**

NAAGBO, Dumle
dumlennaagbo@iaue.edu.ng

Department of Employment Relations and Human Resource Management
Ignatius Ajuru University of Education, Rumuolumeni, Port Harcourt, Rivers State

Abstract

This study examined the relationship between forecasting manpower demand and the organizational performance of selected oil and gas firms in Port Harcourt, Rivers State, Nigeria, with customer satisfaction and productivity as the criterion measures of performance. Anchored on the Resource-Based View Theory, Contingency Theory, and the AMO (Ability, Motivation and Opportunity) Theory, the study adopted a cross-sectional survey design. A population of 400 managers and supervisors was drawn from five selected oil and gas firms, from which a sample of 200 respondents was determined using the Taro Yamane (1967) formula. Bowley's (1926) proportional allocation technique was used to distribute the sample across the firms. Data were collected via a structured questionnaire and analysed using Spearman's Rank Order Correlation Coefficient (ρ) with IBM SPSS version 21. Findings revealed a significant positive relationship between forecasting manpower demand and customer satisfaction ($\rho = .833, p < .05$), and a significant positive relationship between forecasting manpower demand and productivity ($\rho = .710, p < .05$). The study concluded that accurate forecasting of manpower demand substantially enhances organizational performance in terms of customer satisfaction and workforce productivity in oil and gas firms in Port Harcourt. It was recommended that oil and gas firms should institutionalize systematic and data-driven manpower forecasting processes to ensure optimal service delivery and competitive advantage.

Keywords: Forecasting Manpower Demand, Customer Satisfaction, Productivity, Organizational Performance, Oil and Gas Firms, Human Resource Planning

1. Introduction

The ability of organizations to accurately estimate their human resource requirements at any given point in time represents one of the most fundamental imperatives of effective human resource planning. In the oil and gas sector, where technical complexity, operational urgency, and client expectations are simultaneously demanding, the failure to forecast manpower needs with precision generates severe consequences for service delivery and organizational performance (Parker & Caine, 2006; Hassan, 2010). Forecasting manpower demand is defined as the process of estimating the future number of people required and the likely skills and competencies they will need (Armstrong, 2012). This process, when executed systematically, ensures that the right number of employees are available at the right time and place to execute organizational tasks, thereby enabling firms to meet customer expectations and sustain competitive productivity levels (Lunenburg, 2012; Noe, Hollenback, Gerhart & Wright, 2000). The oil and gas sector in Port Harcourt, Rivers State, occupies a pivotal position in Nigeria's economic landscape, yet continues to grapple with chronic workforce mismatches arising from inadequate manpower planning, with direct consequences for customer satisfaction and productivity (Armstrong, 2006; Flippo, 1984).

Customer satisfaction has been established as a central measure of organizational performance, reflecting the degree to which a firm's outputs meet or exceed customer expectations (Kaplan & Norton, 1992; Dimitriadis, 2006). Research has confirmed that satisfied customers contribute disproportionately to organizational profitability through repeat patronage and positive referrals, making customer satisfaction a critical strategic priority (Hennig-Thurau, Gwinner & Gremler, 2002; Homburg, Koschate & Hoyer, 2001). Within the oil and gas sector, service reliability, technical responsiveness, and workforce adequacy are primary determinants of customer

satisfaction outcomes. When firms lack the right number of employees to carry out essential duties, service delivery suffers, and customer satisfaction declines (Hom & Griffeth, 1995; Delaney & Huselid, 1996). Forecasting manpower demand directly addresses this problem by ensuring that staffing levels are aligned with service delivery requirements at all times, creating the conditions necessary for sustained customer satisfaction.

Productivity, understood as the ratio of output to input and a measure of the quantity and quality of work done considering the resources utilized (Millar, 2007; Mathis & Jackson, 2003), is equally consequential for oil and gas firms. Workforce productivity is influenced by the degree to which staffing levels are commensurate with operational demands. When organizations experience manpower shortfalls due to inadequate forecasting, existing employees are burdened with excess workload, leading to fatigue, error, declining morale, and output deterioration (Nwachukwu, 2007; Lake, 2007). Conversely, accurate manpower demand forecasting enables organizations to maintain optimal staffing levels, ensuring that employees operate within manageable workload parameters that sustain high performance (Hellriegel, Slocum & Woodman, 1999). Despite the conceptual clarity of this relationship, empirical evidence specifically linking forecasting manpower demand to customer satisfaction and productivity outcomes in oil and gas firms in Port Harcourt remains limited, constituting the primary research motivation for this study.

1.1 Statement of the Problem

Oil and gas firms in Port Harcourt, Rivers State, have been confronted with persistent challenges of inadequate service quality, customer dissatisfaction, and suboptimal productivity, despite operating in one of Nigeria's most commercially significant industrial zones. A fundamental driver of these challenges is the absence of systematic manpower demand forecasting processes, which results in chronic mismatches between workforce availability and operational requirements (Parker & Caine, 2006; Armstrong, 2006). Consequences of inadequate human resource planning in oil and gas firms include poor completion of tasks, extra workload on available staff, increased fatigue, high stress intensity, and a diminished capacity to meet organizational goals (Flippo, 1984). These operational deficiencies manifest directly in reduced customer satisfaction and declining workforce productivity. Yet, the empirical literature has tended to examine human resource planning in broad terms rather than isolating the specific contribution of forecasting manpower demand to discrete performance outcomes such as customer satisfaction and productivity within the Nigerian oil and gas context (Huselid, 1995; Delaney & Huselid, 1996; Youndt, Snell, Dean & Lepak, 1996). Furthermore, the balance-scorecard framework adopted for performance measurement in this study—drawing on the customer perspective and internal process perspective (Kaplan & Norton, 1992; Norton & Kaplan, 1996)—provides a theoretically rigorous but empirically underutilized lens for assessing oil and gas performance in Port Harcourt. This study therefore addresses the identified gap by empirically establishing the relationship between forecasting manpower demand and the two selected performance measures.

2. Literature Review

2.1 Conceptual Review

2.1.1 Forecasting Manpower Demand

Forecasting manpower demand is the process of estimating the future number of people required and the likely skills and competencies they will need (Armstrong, 2012). The traditional approach to calculating demand involves making use of ratios and analytical strategies to confront opportunities and threats from the external environment (Pradeesh, 2011). Forecasting manpower demand involves a practical-level determination of the size of personnel and the type of workers that a company will require in the future; the demand for the organization's products is an integral part of this optimization, making it imperative to project market and sales figures in advance so as to determine the personnel needed to serve projected capacity (Armstrong, 2012). Lunenburg (2012) identifies the process as involving the identification of staffing needs, forecasting available

personnel, and determining what additions or replacements are required to maintain a staff of the desired quantity and quality.

Once demand has been forecasted, the organization must determine labour supply by analyzing how many workers are currently available and how that supply is likely to change in the future (Noe et al., 2000). A gap analysis is then conducted to ascertain whether there is a shortage or surplus of labour, enabling the organization to plan appropriate responses (Noe et al., 2000). Goals are set in order to address problems arising from surplus or shortage of manpower, with clear timetables for achieving results (Noe et al., 2000). Ultimately, firms must hold specific individuals accountable for achieving manpower planning goals during implementation, providing regular reports to ensure that results are consistent with projections (Noe et al., 2000). Parker and Caine (2006) emphasize that it is important for organizations to have the right number of manpower at all times to avoid the costly consequences of both shortage and excess of personnel.

2.1.2 Customer Satisfaction

Customer satisfaction is a construct of considerable complexity, defined by Giese, Cote and Spiro (2000) as a response to an appraisal process that can differ in duration, and described by Homburg et al. (2001) as the outcome of a cognitive and emotional evaluation made after the tangible perceived experience on all levels and processes are compared to expected standards. According to Dimitriadis (2006), customer satisfaction has been a major goal for business organizations for many years, and loyal customers contribute to the company's profitability by spending more on the company's products and services. Ehigie, Ibode and Ekpe (2009) state that customer-oriented companies strive to satisfy their customers as a foundation for establishing lasting and profitable relations with key clients. Homburg et al. (2001) confirm that most companies strive to establish high levels of customer satisfaction, as it is generally accepted that the establishment and maintenance of acceptable satisfaction levels is the aim of any company that wants to be profitable and survive in a competitive environment.

Customer satisfaction is a psychological state that results from consumer experiences after consumption (Pleshko & Heins, 1996). A satisfied buyer is more likely to repurchase again, and satisfied customers help firms reduce marketing costs and develop more stable levels of sales when a large number of satisfied buyers are retained (Dimitriadis, 2006). Kaplan and Norton (1992) identify the customer perspective as one of the four key dimensions of the balanced scorecard, reflecting how the organization is viewed by its customers and how well it is serving them in order to achieve its financial objectives. Customer satisfaction, as the specific measure of customer performance adopted in this study, is therefore directly linked to the firm's capacity to deploy adequate and competent manpower for service delivery.

2.1.3 Productivity

Productivity is a measure of the quantity and quality of work done, considering the cost of the resources used (Millar, 2007). Mathis and Jackson (2003) define productivity as a measure of the quantity and quality of work done, considering the cost and human resources utilized, noting that the more productive an organization is, the better its competitive advantage. Ali and Opatha (2008) state that productivity can be measured in terms of responsiveness, morale, quality and quantity of production, and customer satisfaction. McNamara (2005) affirms that measuring productivity involves determining the length of time that an average employee needs to generate a given level of production, and the amount of time that a group of employees spends on certain activities such as production, travel, or idle time waiting for materials.

Productivity is the relationship between units of labour input and units of output, and its measurement serves as a scorecard for the effective use of resources (Nwachukwu, 2007). Hellriegel et al. (1999) define productivity as efficiency in the employment of factors of production such as land, labour and capital to produce higher output. Nwachukwu (1992) identifies five determinants of productivity: technology, supervisor skill, economic factors, managerial ability, and training.

Bernardin (2007) maintains that controlling labour costs and increasing productivity through clearer linkages between pay and performance are crucial components of human resource management for achieving competitive advantage. Brady (2008) notes that perhaps none of the resources used for productivity in organizations are so closely scrutinized as human resources, and that HR activities including pay, appraisal systems, training, selection, job design, and compensation are directly concerned with productivity outcomes. The Performance Measurement Body of Knowledge (PMBOK, 2007) views productivity measures across the categories of effectiveness, efficiency, and time management.

2.2 Theoretical Framework

This study is anchored on three complementary theoretical frameworks: the Resource-Based View (RBV) Theory, Contingency Theory, and the AMO (Ability, Motivation and Opportunity) Theory. The RBV, articulated by Barney (1991), posits that competitive advantage is achieved through the possession of valuable, rare, inimitable, and non-substitutable resources, with human resources constituting the most strategically significant of these. Takeuchi, Lepak, Wang and Takeuchi (2007) established that competitive advantage derives from the internal human resources that the organization has, and that firms must build a valuable set of human resources and bundle them in unique ways to achieve firm success. In this study, the systematic forecasting of manpower demand represents the mechanism through which firms ensure the availability of strategically configured human resources, directly enabling customer satisfaction and productivity outcomes.

Contingency Theory, as articulated by Chandler (1962), Miles and Snow (1978), and Porter (1985), posits that HR strategies will be more effective when they are appropriately aligned with business strategy and environmental demands. Firms whose HR policies and practices are more responsive to external competitive and operational factors tend to achieve higher performance (Guest, 1997). In the context of this study, forecasting manpower demand represents the HR planning mechanism that aligns workforce availability with the operational and service demands of the oil and gas environment, thereby enabling superior customer satisfaction and productivity outcomes. The AMO Theory, initiated by Bailey (1993) and developed by Appelbaum, Bailey, Berg and Kalleberg (2000), specifies that HR practices influence organizational performance by enhancing employees' abilities, strengthening their motivation, and providing opportunities to participate in value-creating activities. As adopted by Huselid (1995), MacDuffie (1995), Appelbaum et al. (2000), and Purcell, Kinnie, Hutchinson, Rayton and Swart (2013), the AMO framework underscores how adequate manpower, secured through effective demand forecasting, shapes the ability dimension of employee performance.

2.3 Empirical Review

Franklin (2011), in a study of a public organization in Egypt, found that human resource planning, including forecasting mechanisms, is crucial for operational efficiency and performance effectiveness in organizations reliant on public and donor funds. Hassan (2010), in a study of determinants of successful HR planning using public health hospitals in Norway, found that HR planning significantly influences the multi-dimensional performance outcomes of organizations and concluded that human resource planning aims at fulfilling the objectives of manpower requirements and is an important process linking business strategy to operations. Walker (2012), in a study on the recruitment of talented personnel, demonstrated that a key purpose of HR planning is to recruit and select the most capable personnel to fill job vacancies, with direct consequences for service delivery and performance. Gifford (2011), in a study on the development of human resources, found that human resource planning identifies skill requirements for various job levels, and that training programs imparting required skills directly improve task performance. Harrison (2012) further showed that human resource planning ensures that organizations acquire and utilize manpower effectively to minimize overall costs of production.

Marwat (2006) reported seven variables that positively relate to employee performance, including selection, training, performance appraisal, career planning, compensation plans, employee participation, and job definition, affirming the centrality of planned HR activities to organizational outcomes. Sarkodie (2011) revealed that without proper human resource planning, organizations cannot attain their goals, noting that along with employees' individual skills, organizational resources must be managed to ensure sustained growth and development. Mursi (2003) established that there is a significant and positive relationship between human resource planning and organizational performance. Hiti (2000) similarly posited that human resource planning has a positive relationship with organizational performance. Huselid (1995) found that well-formulated human resource programs not only reduce employee turnover but also make substantial contributions to financial performance and productivity. Paauwe and Richardson (1997) posited that human resource planning positively affects employees by increasing job satisfaction and motivation, which leads to positive operational results in terms of the quality and quantity of products and services, with further effects on financial performance, return on assets, revenue, and market share.

Delaney and Huselid (1996) found that HR planning activities affecting employee skills, employee motivation, and the structure of work are positively related to organizational performance, and that HR planning including selectivity in staffing, training, incentive and compensation are positively related to perceptual measures of organizational performance relative to industry competitors. Youndt et al. (1996) demonstrated that HR management practices have a significant effect on organizational performance, including customer alignment, machine efficiency, and employee productivity. Arthur (1994) showed that HR management practices, when they increase employee discretionary effort, improve firm productivity. Bae and Lawler (1999) established that firms which align their HR management practices with business strategy tend to become superior to their competitors. Ramsey, Scholarios and Harley (2000) found that human resource planning improves the performance of organizations and that HR planning affects firm performance when it allows employees to contribute to organizational goals. Wright (1999) confirmed that human resource planning has been found to affect firm performance when it allows employees to contribute to the organization.

2.4 Hypotheses

Based on the foregoing empirical review and theoretical framework, the following null hypotheses were formulated:

H₀₁: There is no significant relationship between forecasting manpower demand and customer satisfaction of selected oil and gas firms in Port Harcourt.

H₀₂: There is no significant relationship between forecasting manpower demand and productivity of selected oil and gas firms in Port Harcourt.

3. Methodology

This study adopted a cross-sectional survey research design to examine the relationship between forecasting manpower demand and the organizational performance of selected oil and gas firms in Port Harcourt, Rivers State, Nigeria, with customer satisfaction and productivity as the criterion measures. The design was considered appropriate for capturing organizational perceptions and practices at a specific point in time, enabling efficient and cost-effective data collection (Sekaran, 2001). The target population comprised 400 managers and supervisors drawn from five selected oil and gas firms: Keverner Oil Field Products (KOP) Nigeria Limited (85), Coolper Cameron Oil and Gas Nigeria Limited (75), Drill-Quip Oil and Gas Nigeria Limited (95), Vetco-Gray Oil and Gas Nigeria Limited (65), and FMC Technologies Oil and Gas Nigeria Limited (80). A sample of 200 respondents was determined using the Taro Yamane (1967) formula at a 0.05 level of significance, and Bowley's (1926) proportional allocation technique was applied to distribute the sample proportionally across the five firms. Data were collected through a structured, self-administered questionnaire comprising items measured on a five-point Likert scale ranging from 1 (Strongly

Disagree) to 5 (Strongly Agree), with four items each for forecasting manpower demand, customer satisfaction, and productivity. Content validity was established through expert review by peers in the field, while the Cronbach Alpha reliability coefficient was assessed at the Nunnally (1970) threshold of 0.70 as adopted in the study (Zeb-Obipi, 2007). Prior to hypothesis testing, normality was assessed using the Kolmogorov-Smirnov and Shapiro-Wilk tests, and the results confirmed non-normal data distributions, thereby justifying the adoption of Spearman's Rank Order Correlation Coefficient (ρ) as the non-parametric inferential statistic for hypothesis testing. Data analysis was conducted using IBM SPSS version 21. Hypotheses were tested at a 0.05 level of significance; null hypotheses were rejected where $p < 0.05$ and retained where $p > 0.05$.

4. Results

4.1 Descriptive Statistics

Table 1: Descriptive Statistics for Forecasting Manpower Demand, Customer Satisfaction and Productivity

Variable	N	Median	IQR	Min	Max
Forecasting Manpower Demand	200	3.25	0.00	1.00	5.00
Customer Satisfaction	200	3.75	1.00	2.00	5.00
Productivity	200	4.00	1.00	1.00	5.00

Source: Survey Data, 2026

Table 1 presents the descriptive statistics for the three study variables. Forecasting manpower demand recorded a median score of 3.25 (IQR = 0.00), indicating a moderate but consistent level of agreement among respondents that their firms engage in manpower demand forecasting. Customer satisfaction returned a median of 3.75 (IQR = 1.00), reflecting a generally positive level of customer satisfaction among the sampled firms. Productivity recorded the highest median of 4.00 (IQR = 1.00), indicating that respondents largely perceived their firms as achieving satisfactory productivity levels. The inter-quartile range values indicate that responses were relatively concentrated around the central tendency scores, lending credibility to the descriptive statistics.

4.2 Hypothesis Testing

Table 2: Spearman's Rank Order Correlation – Forecasting Manpower Demand, Customer Satisfaction and Productivity

Variable	Statistic	Forecasting Manpower Demand	Customer Satisfaction	Productivity
Forecasting Manpower Demand	Correlation Coefficient	1.000	.833**	.710**
	Sig. (2-tailed)	—	.001	.017
	N	200	200	200
Customer Satisfaction	Correlation Coefficient	.833**	1.000	—
	Sig. (2-tailed)	.001	—	—
	N	200	200	200
Productivity	Correlation Coefficient	.710**	—	1.000
	Sig. (2-tailed)	.017	—	—
	N	200	200	200

***Correlation is significant at the 0.05 level (2-tailed).*

Source: Survey Data, 2026

Hypothesis One (HO1): There is no significant relationship between forecasting manpower demand and customer satisfaction of selected oil and gas firms in Port Harcourt.

The Spearman's correlation result in Table 2 reveals a positive and statistically significant relationship between forecasting manpower demand and customer satisfaction ($\rho = .833$, $p = .001 < .05$). Since $p < 0.05$, the null hypothesis is rejected. There is therefore a significant positive relationship between forecasting manpower demand and customer satisfaction in the selected oil and gas firms in Port Harcourt. The higher the level of accuracy and consistency in forecasting manpower demand in these firms, the higher the level of customer satisfaction achieved.

Hypothesis Two (HO2): There is no significant relationship between forecasting manpower demand and productivity of selected oil and gas firms in Port Harcourt.

The Spearman's correlation result in Table 2 reveals a positive and statistically significant relationship between forecasting manpower demand and productivity ($\rho = .710$, $p = .017 < .05$). Since $p < 0.05$, the null hypothesis is rejected. There is therefore a significant positive relationship between forecasting manpower demand and productivity in the selected oil and gas firms in Port Harcourt. Firms that systematically forecast their manpower needs achieve demonstrably higher levels of workforce productivity.

4.3 Discussion of Findings

The finding that forecasting manpower demand is significantly and positively related to customer satisfaction ($\rho = .833$, $p < .05$) aligns with the RBV proposition that strategically aligned human resources generate superior organizational outcomes (Barney, 1991; Takeuchi et al., 2007). This result corroborates the findings of Delaney and Huselid (1996), who established that HR planning activities affecting employee skills and the structure of work are positively related to organizational performance including service quality. It also supports Hassan (2010), who found that HR planning success is linked to the relevance of services provided to social needs; a direct proxy for customer satisfaction. The result further aligns with the empirical argument of Hom and Griffeth (1995), who asserted that when employees are not committed to their firms owing to overwork and inadequate staffing, it results in poor service quality and customers not being satisfied. The strength of the correlation ($\rho = .833$) confirms that among the factors influencing customer satisfaction in oil and gas firms, accurate manpower demand forecasting is a particularly potent determinant, consistent with Kaplan and Norton's (1992) balanced scorecard framework in which customer perspective outcomes are directly linked to internal workforce capacity.

The finding that forecasting manpower demand is significantly and positively related to productivity ($\rho = .710$, $p < .05$) is consistent with the AMO Theory, which posits that HR practices enhance employee ability and motivation, collectively driving improved organizational performance (Appelbaum et al., 2000; Huselid, 1995). This finding corroborates Huselid (1995), who found that well-formulated human resource programs make substantial contributions to financial performance and productivity. It also aligns with Youndt et al. (1996), who demonstrated that HR management practices have a significant effect on organizational performance including employee productivity and machine efficiency. The finding supports the position of Paauwe and Richardson (1997), who posited that HR planning positively affects employees in ways that lead to positive operational results in terms of the quantity and quality of products and services. The moderate-to-strong correlation ($\rho = .710$) further reflects that productivity in oil and gas firms is also shaped by other variables identified by Nwachukwu (1992), including technology, supervisor skill, economic factors, and training, suggesting that forecasting manpower demand is a necessary but not exhaustive driver of productivity.

5. Conclusion and Recommendations

This study examined the relationship between forecasting manpower demand and two measures of organizational performance: customer satisfaction and productivity, in selected oil and

gas firms in Port Harcourt, Rivers State, Nigeria. On the basis of Spearman's Rank Order Correlation analysis of data from 200 respondents, the study found significant positive relationships between forecasting manpower demand and customer satisfaction ($\rho = .833$, $p < .05$) and between forecasting manpower demand and productivity ($\rho = .710$, $p < .05$). These findings affirm that systematic manpower demand forecasting is a strategic HR planning activity with tangible and measurable consequences for service delivery quality and workforce efficiency in the Nigerian oil and gas sector. The study's theoretical grounding in the RBV, Contingency Theory, and AMO Theory provides robust frameworks for understanding how human resource forecasting activities translate into superior organizational performance outcomes.

Based on the findings, the following recommendations are offered:

1. Management of oil and gas firms in Port Harcourt should institutionalize formal, data-driven manpower demand forecasting systems that incorporate both short-term and long-term operational projections, making use of analytical tools such as ratio-trend analysis and work-study techniques alongside management judgment.
2. HR departments in these firms should establish direct linkages between manpower forecasts and service delivery standards, ensuring that customer-facing roles are adequately staffed at all times to prevent service gaps that erode customer satisfaction.
3. Firms should integrate productivity metrics into their manpower planning dashboards, enabling real-time monitoring of the relationship between staffing levels and output efficiency.
4. Oil and gas firms should avoid the twin pitfalls of manpower shortage and excess, both of which impair organizational performance by conducting regular gap analyses and developing timely corrective HR strategies.

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